



System Development and Life-Cycle Management (SDLCM) Methodology

Subject Test Plan	Type	Standard
	Identifier	S-5151
	Effective Date	July 2002
	Revision No.	2

Approval

CISSCO Program Director

A. PURPOSE

This standard specifies content and format requirements for the Test Plans. The Test Plan (TP) identifies the informal and formal testing that is planned in the Project/Task at each of the Unit, Integration, Qualification and Acceptance Test levels, the test scenarios to be used, and the roles and responsibilities for testing. TPs are typically produced during the Component 3, Design the Solution, effort. The intended audience for these documents is testers (engineers and business users), management, software developers, operations support personnel, and quality assurance personnel.

B. APPLICABILITY

This standard applies to all SDLCM Methodology Project/Tasks. It is used by those persons who write test plans to verify that the activities completed within Component 3, Design the Solution were implemented properly in Component 4, Build the Solution. The requirements tested are traceable to the System Requirements Specification.

C. REFERENCE PUBLICATIONS

The following publications contain related information:

- *SDLCM Methodology Handbook*
- SDLCM Methodology Standard S-3051, System Requirements Specification
- SDLCM Methodology Standard S-3171, Logical Design Document
- SDLCM Methodology Standard S-3172, Physical Design Document
- SDLCM Methodology Standard S-3053, System Operations Concept

D. STANDARD

The Test Plan contains the test plans and procedures for each planned test, and provides a place to record the test results. It describes the software and manual test environment, data recording methods and test execution criteria required.

Testing may be mapped to four broad categories:

- Unit Testing — traceable to the requirements in the Logical Design Document (LDD), Physical Design Document (PDD), verifying the logic, computations,

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- functionality, and error handling of a unit. Testing at this level may be formal and/or informal.
- Integration Testing — traceable to the requirements in the LDD, PDD, and/or System Requirements Specification (SRS), verifying the internal integrity of a collection of units (sometimes called a module) and verifying the external interfaces with other modules, data files, and external input and output. Testing at this level may be formal and/or informal, but should conclude with a formal verification of system integrity before the transition to the Qualification test level.
 - Qualification Testing — traceable to the system requirements in the SRS, ensuring that the system satisfies its requirements, and to the SOC for manual processes. Testing at this level is normally formal, witnessed by the customer and documented to provide the basis for regression testing during the maintenance phase. Informal end-to-end testing by the user may also be conducted, using the SOC as a reference.
 - Acceptance Testing for Operational Support and Project — traceable to the system requirements in the SRS and the OSG for Operational level and to the user tests for high priority requirements satisfaction.

The following steps should be followed when writing a test plan:

- Understand the software or system requirements; answer the following questions:
 - ◊ What is this system supposed to accomplish?
 - ◊ How are these functions supposed to be implemented
- Divide the requirements into functional areas.
- Determine the dependencies among the functions and the interfaces between the functions.
- When writing the actual test scenarios for the test plan, group the tests into functional areas and address the testing of the requirements, the dependencies and the interfaces.
- Understand the state of user/business knowledge for the system. Tailor levels of test to accommodate intended users in both testing and operational scenarios.

The following paragraphs describe the content of each section of the Test Plan. Add sections and subsections as appropriate to cover whatever range of testing is required to validate and verify the software and hardware requirements, as well as the design, in a cost-effective manner. Sections and subsections that are not applicable should *not* be deleted; they should indicate “Not Applicable.”

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1. INTRODUCTION

1.1 Background

Describe the design and implementation activities that occurred within Components 3 and 4 that generated the need for a test plan.

1.2 Objectives

Describe the objectives of this test plan.

1.3 Scope

Specify what this test plan covers and what it does not cover, based on the requirements and design developed within the Design the Solution Component of the SDLCM Methodology.

1.4 Assumptions

Specify any assumptions that are being made and the risks associated with those assumptions.

1.5 Applicable Documents

Specify any documentation used to support the creation of the TP. List the documents. Cite documents by publisher or source; document number or other unique identifier (if any); title, version or release designator (if any); and date. Note, that any documents actually cited in the text should be listed in the references section at the end of the document.

2. APPROACH

Describe the approach that will be used to achieve the objectives stated in the introduction, including the following:

- Describe the levels of testing that will be addressed by this test plan.
 - ◇ Unit Testing
 - ◇ Integration Testing
 - ◇ Qualification Testing
 - ◇ Acceptance Testing, including business/user knowledge tests

Note: Sections and subsections that are not applicable should *not* be deleted; they should indicate “Not Applicable.”

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- Describe the roles that will be involved at each level of testing and the scenarios to be used by each of the following:
 - ◇ Developers
 - ◇ Independent Test Team
 - ◇ Users
 - ◇ Quality Assurance personnel
 - ◇ Business knowledge users
 - ◇ Operations Support Personnel
- Identify and describe the plans for implementing and controlling the resources (that is, software, firmware and hardware) necessary to perform each level of testing.
 - ◇ Identify the software items (for example, operating systems, compilers, code auditors, dynamic path analyzers, test drivers, preprocessors, test data generators, post-processors) necessary to perform each level of testing activities. Describe the purpose of each item and identify any proprietary or security issues associated with the software item
 - ◇ Identify the computer hardware, interfacing equipment and firmware items to be used in the software test environment. Describe the purpose of each item and identify any proprietary or security issues associated with the hardware or firmware item
 - ◇ Identify the plans for installing and testing each resource item, including data, prior to its use. Describe the plans for controlling and maintaining each item of the software test environment
- Describe the testing methods that will be used.
 - ◇ Functional—to verify the functionality and correct interfacing of application software and manual components to perform at the business functional level
 - ◇ Structural—to verify the correct implementation of the design by ensuring that each statement or logic path or software component is executed at least once
 - ◇ Statistical—to verify that business function scenarios important to the end-user are exercised
 - ◇ Regression—to verify that changes made to the software after initial testing have not adversely affected previously tested software.
- Describe the data reduction and analysis techniques to be used during and following the tests identified in the test plan. Document how the information resulting from data reduction and analysis is to be retained. The results of data recording, reduction and analysis activities are documented to show whether the test objectives have been met.

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- Describe the criteria by which the testing efforts are measured.
 - ◊ Pass/Fail Criteria—Identify the requirements needed for a particular test to pass or fail
 - ◊ Suspension/Resumption Criteria—Describe the criteria used when determining if any test should be suspended or resumed.

3. TEST IDENTIFICATION

Identifies each test scenario, drawing from or adding to the library of scenarios in Appendix A, and describes the test requirements for each system requirement to which this test plan applies.

3.X System or Software Function

Consists of separately numbered sections that identify each system or software function by name and Project/Task-unique identifier.

3.X.1 GENERAL TEST REQUIREMENTS

Describes the requirements that apply to the planned tests.

3.X.2 TEST DEFINITIONS

Consists of separately numbered sections that identify and describe each test to be conducted for this system or software function

3.X.2.Y (Test Name and Project/Task-Unique Identifier)

Identifies a test by name and Project/Task-unique identifier. Some or all of this information may be provided graphically. This section provides the following information:

- Test objective
- Special requirements (for example, 24 hours of continuous facility time)
- Test level
- Test type or class
- Type of data to be recorded
- Assumptions and constraints

3.X.2.(Y+n) (Test Name and Project/Task-Unique Identifier)

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3.(X+1) Test Schedule

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Contains the test schedule for conducting the tests identified in Section 3.X. This information may be placed in an appendix.

3.(X+2) Traceability Matrices

Show a cross-reference of the tests to be performed that demonstrate satisfaction of the requirements of this effort/project. This information should be presented in the format of Table 5151-1.

Summarize the requirements to be tested and the test number to be used to test each requirement in a Table such as that shown in Table 5151-1. The requirements were first uniquely identified and numbered in the SRS Document. The design was traced to the requirements in the Logical Design Document and/or Physical Design Document. This traceability matrix maps the tests back to the original requirements.

Table 5151-1. Requirements to Test Traceability Matrix

Requirement	Test Number
Requirement 1	Test 1
Requirement 2	Test 2
Requirement 3	Test 3

3.(X+3) Qualification Methods

Describes qualification methods to be used. This information may be placed in an appendix.

3.(X+4) Evaluation and Summary

Define the process to be used for the evaluation and summary of all the individual test results.

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APPENDIX A - LIBRARY OF TEST CASES

This appendix contains a summary table of tests (Table 5151-2) associated with the SRS and other individual test specifications. Thus, each section in this appendix may be applied to an individual test case.

Each test case will consist of a Purpose section, a Preparation and Instruction section, a Procedures section and Script and Verification section.

Table 5151-2. SUMMARY TABLE OF TEST CASES

Requirement/Business Rule/Process Flow Description	Test Case Identification Number
Requirement 1	Test Case 1
Requirement 2	Test Case 2
Business Rule 1	Test Case 3
Business Rule 2	Test Case 4
Process Flow 1	Test Case 5
Process Flow 2	Test Case 6

A.1 Test Case Number and Name

Identify the test case by unique number or name.

A.1.1 Purpose

Insert a brief description of the test case, including its intended purpose.

A.1.2 Preparation and Instruction

Insert a description of the test environment and instructions for preparation and setup/initialization for this test case.

A.1.3 Procedures

Insert description of the administrative and control procedures for this test, including and instructions or provisions for how the test should be conducted and how and when to capture verification evidence (i.e. use of stopwatch, printing of screens, etc.). This section should provide instruction to the tester regarding whether to continue testing when a verification fails or what to do if this happens (i.e., what information to record, who to contact, etc.). This section should also address whether test monitors will be available during the testing.

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A.1.3.1 Scripts and Verification

Insert the step-by-step script which provides instructions on an order of sequence for conducting the test, providing verification details for determining if what is seen at the beginning and end of each step is what should be expected. The use of a check-box approach may be utilized for recording positive and negative verification.

A.1.3.2 Test Feedback Report

A Test Feedback Report should be produced for each test.

A.1.3.2.1 Test Summary

Provide information regarding what the tester should document regarding the overall success or failure of the test. Capture the printed name of the tester, their signature and the date of test.

A.1.3.2.2 Testing Issues

Describes the information needed from the tester (i.e., information on the step being taken when anomalies or discrepancies were encountered during the execution of the test scenario). Inclusion of this section may be helpful in isolating and correcting the cause of any discrepancies. Address any additional information that you require (i.e., screen prints submitted with Test Feedback Report, etc.).

A.2 Test Case Number and Name

A.2.1 Purpose

...

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A.n Test Case Number and Name

A.n.1 Purpose

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