DOCUMENT NUMBER: **ESS/SDLC/QSP/005**

DOCUMENT TITLE: **INTEGRATION AND SYSTEM TESTING PROCEDURE**

DOCUMENT HISTORY:

S. NO.	ISSUE/ REVISION/ AMENDMENT NUMBER	DATE	CHANGE SYNOPSIS
1	00/00/00	9-11-1998	Initial Issue
2	01/00/00	26-11-1998	1. Procedure covers the four development activities. 2. Review of Test Plans by the Product/Project Manager.
3	02/00/00	30-01-1999	1. Reference documents to include 'Do's and Don'ts'.
S. NO.	**ISSUE/ REVISION NUMBER**	**DATE**	**CHANGE SYNOPSIS**
4	03/00	17-06-1999	Significant changes in procedure
5	04/00	13-10-1999	1. Changes as per new Organisation Structure. 2. RECORDS section changed.
6	04/01	24-01-2000	1. 'Draft User Manual' removed from inputs. 2. Reference to two Test Result Report formats.
7	05/00	17-07-2000	Significant changes.
8	06/00	16-10-2000	Reference to Acceptance Testing removed.
9	06/01	04-12-2000	Reference to Test Case Coverage Matrix included.
10	06/02	28-11-2001	Changes as per new Organisation Structure.
11	07/00	29-11-2005	1. Ltd. removed from company name in document header. 2. References section updated.
S. NO.	**ISSUE NUMBER**	**DATE**	**CHANGE SYNOPSIS**
12	08	23-10-2012	1. Significant changes.
13	09	06-12-2012	1. Reference to sequence of integration and Release Plan included. 2. Project Manager reviews test cases.

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APPROVED BY:

INTEGRATION AND SYSTEM TESTING PROCEDURE

1. PURPOSE

The purpose of this procedure is to test the developed software to ensure that it satisfies the software requirements.

2. SCOPE

This procedure applies to all Software Projects undertaken by the Company. This procedure does not apply to Unit Testing of the developed software.

3. START CRITERIA

Reference Documents received for preparing Test Scenarios and Test Cases,
OR
Unit tested software received for Integration/ System Testing.

4. INPUTS

4.1 System Design Document.
4.2 System Requirement Specification Document and Use Cases.
4.3 Test Plan.
4.4 Previous round's Test Failure Reports or reports generated by bug tracking tool, if applicable.

5. RESPONSIBILITIES

Project Manager is responsible for:

- providing Reference Documents
- fixing up the errors as listed in Test Failure Reports or bug tracking tool

Testing-in-charge is responsible for Integration/ System testing activities.

6. PROCEDURE

6.1 Project Manager makes the developed software available for Integration/ System testing, along with the System Design Document (refer System Design Standards ESS/SDLC/STD/004), System Requirement Specification Document and Use Cases (refer System Requirement Analysis Procedure ESS/SDLC/QSP/001). These must cover the following:

- logical flow and functionality of the Software Project
- list of mandatory fields of each option
- inter-linkages of the modules
- Interfaces
- Sequence of integration of the software components
- Do's and Don'ts for the concerned software, if any

The mechanism for testing, i.e., whether testing records will be maintained manually or will be logged and tracked using a bug tracking tool will depend on the project's requirements. The same is documented in the project's Project Plan (refer Project Plan Procedure ESS/PROJ/QSP/002) and Test Plan (refer Test Plan Procedure ESS/SDLC/QSP/007).

6.2 Testing-in-charge reviews interface descriptions and sequence of integration of the software components as documented in System Design Document, before preparation of test cases. Records of review are maintained (refer Review Procedure ESS/QA/QSP/003).

6.3 Testers prepare Test Scenario/Test Cases/Test Data on the basis of the System Design Document/ System Requirement Specification Document/ Use Cases and in accordance with the Test Plan. Test Cases contain references to the relevant sections of System Design Document. Test Scenario/Test Cases are prepared as per the format Test Scenario and Test Case (ESS/SDLC/FRM/003).

6.4 Test Cases undergo peer review as per Review Procedure (ESS/QA/QSP/003).

6.5 Project Manager or nominee reviews the Test Scenario/Test Cases as per Review Procedure (ESS/QA/QSP/003).

6.6 Test Cases are controlled as per Procedure for Control of Project Related Documents (ESS/PROJ/QSP/011).

6.7 Testing-in-charge defines the critical requirements and features of application to be tested in the section "Features to be tested" of Test Plan. When code is received for testing, a high level smoke testing is performed as per this section to ensure that no showstopper errors persist, unit testing has been done and build is stable.

6.8 Testing-in-charge creates test environment as per the specifications given in the Test Plan.

6.9 **Test Execution**: During execution phase, the test cases / plans / scenarios are utilized within the test environment. For achieving complete testing coverage, testing is conducted in a sequential manner as given below:

Integration Testing

- It involves testing of groups of components integrated to create a system or sub-system.
- Tests are based on integration specification.

System Testing

- It involves testing of the complete system to ensure that it has met the functional and non- functional requirements specified by the customer.
- Tests are based on a system specification.

6.10 Testers fill in Test Case Coverage Matrix (ESS/SDLC/FRM/007) during each round of testing to trace the coverage of test cases and also to determine the total number of pass vs. fail test cases for each round.

6.11 Whenever actual and expected outputs do not match as per the Test Case, Testers prepare Test Failure Report (ESS/SDLC/FRM/004) or log the errors in bug tracking tool, describing the error encountered along with the action recommended to fix the error. Relevant entries are updated in Test Case Coverage Matrix.

6.12 Apart from the documented scheduled Test Cases, Testers may also perform ad hoc testing. In case the Tester finds an error during ad hoc testing, he/she documents it in the Test Failure Report or logs the errors in bug tracking tool and indicates that the error was found through ad hoc testing. After the testing round is complete, the Tester prepares a Test Case for the error encountered. All such Test Cases are included in the library of Test Cases once the software is released.

6.13 Testers submit the Test Failure Reports to Testing-in-charge. In case the errors are being logged in a bug tracking tool, Testing-in-charge extracts the required information from the tool. Testing-in-charge keeps a record of all rounds of testing carried out in the Defect Status Sheet (ESS/SDLC/FRM/002) and shares the records with the Project Manager.

6.14 Project Manager gets the errors reported in the Test Failure Reports or bug tracking tool fixed.

6.15 For the second round of testing onwards, Testers first refer to the Test Failure Reports (or errors logged in bug tracking tool if applicable) of the previous testing round to verify that all errors that were reported earlier have been fixed. Test Failure Reports (or errors logged in bug tracking tool) are tracked to closure. After closing previous round's Test Failure Reports (or errors logged in bug tracking tool), Testers perform Regression testing to ensure that the fixes have not introduced errors elsewhere in the code. Thereafter the next testing round is carried out.

6.16 Process repeats Step 6.10 onwards till the time release criteria as defined in 'Release Plan' section of Project Plan are met.

6.17 Project Manager sends the results of integration/ system testing, List of Known Problems (if applicable) and other related data to the concerned Regional Head for approval to release the software.

6.18 Concerned Regional Head approves the release with the List of Known Problems (if applicable); else further testing is carried out as per the decision taken by Regional Head. Process repeats at Step 6.10.

7. OUTPUTS

7.1 Software released for Alpha testing.
7.2 Test Failure Reports.
7.3 Defect Status Sheet

8. COMPLETION CRITERIA

8.1 Software released for Alpha testing.

9. REFERENCES

9.1	ESS/SDLC/STD/004	System Design Standards
9.2	ESS/SDLC/QSP/001	System Requirement Analysis Procedure
9.3	ESS/PROJ/QSP/002	Project Plan Procedure
9.4	ESS/SDLC/QSP/007	Test Plan Procedure
9.5	ESS/SDLC/FRM/003	Test Scenario and Test Case
9.6	ESS/QA/QSP/003	Review Procedure
9.7	ESS/PROJ/QSP/011	Procedure for Control of Project Related Documents
9.8	ESS/SDLC/FRM/007	Test Case Coverage Matrix
9.9	ESS/SDLC/FRM/004	Test Failure Report
9.10	ESS/SDLC/FRM/002	Defect Status Sheet

10. RECORDS

S.NO.	QUALITY RECORD	RESPONSIBILITY FOR MAINTAINING	MINIMUM RETENTION PERIOD
10.1 10.2 10.3 10.4 10.5	Review records where relevant. Test Failure Reports. Defect Status Sheet. Test Case Coverage Matrix Test Scenario and Test Case	Testing-in-charge	One year or till Project closure, whichever is later (for records 10.1, 10.2, 10.3, 10.4 and 10.5)