Software Verification and Validation Process
# Change History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Author</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7/06/06</td>
<td></td>
<td>Initial Draft</td>
</tr>
<tr>
<td>2</td>
<td>8/31/06</td>
<td></td>
<td>Revision</td>
</tr>
<tr>
<td>3</td>
<td>9/08/06</td>
<td></td>
<td>Revision</td>
</tr>
<tr>
<td>A</td>
<td>9/21</td>
<td></td>
<td>Initial Release</td>
</tr>
<tr>
<td>B</td>
<td>3/15/07</td>
<td></td>
<td>Updated the &quot;Proprietary and Confidential&quot; statement</td>
</tr>
<tr>
<td>C</td>
<td>08/17/2012</td>
<td></td>
<td>Update to current processes</td>
</tr>
<tr>
<td>D.00</td>
<td>03/07/2013</td>
<td>Hart InterCivic</td>
<td>Update file naming and version conventions</td>
</tr>
<tr>
<td>D.01</td>
<td>11/13/2014</td>
<td>Hart InterCivic</td>
<td>TDP Discrepancy update</td>
</tr>
</tbody>
</table>
# Table of Contents

1  PURPOSE .......................................................................................................................... 4

2  REQUIREMENTS ............................................................................................................. ERROR! BOOKMARK NOT DEFINED.

3  FLOW CHART ................................................................................................................. 4

4  SOFTWARE QUALITY ASSURANCE PROCESSES ..................................................... 4
   4.1 Functional Test ............................................................................................................. 4
   4.2 Integration And Regression Tests ............................................................................... 5
   4.3 Final Regression Tests ............................................................................................... 5
   4.4 Other Tests .................................................................................................................. 5

5  SOFTWARE ENGINEERING PROCESSES ................................................................. 5
   5.1 Software Update ........................................................................................................... 5
   5.2 Software Validation .................................................................................................... 5
1 PURPOSE

The purpose of this procedure is to outline the steps necessary to verify and validate that the software meets all design input such as Functional Specifications and Product Requirements.

2 INFORMATIVE REFERENCES

- ISO9001:2000 5.2 Customer focus
- ISO9001:2000 7.3 Design and development

3 FLOW CHART

![Software Design Verification and Validation Flow Chart]

4 SOFTWARE QUALITY ASSURANCE PROCESSES

4.1 Functional Test

Functional testing is performed when a software feature(s) is complete as indicated by the software developer or Application LifeCycle Management (ALM) Tool. Functional testing is the process of running Test Cases within a feature specific Test Script to verify the application meets the functional objectives, documented in the Master Test Plan, Functional Specifications and Product Requirements. Defects found are entered into the ALM Tool to help with software debugging.

Exit criteria as described in the Master Test Plan will be considered for defect prioritization and resolution. Records of the Functional Test execution are maintained in the projects repository in compliance with the Records Matrix.
4.2 Integration And Regression Tests

Integration testing is the process of verifying the interfaces between system components. Defects found are entered into ALM Tool to help with software debugging.

Regression Test focuses on executing the functional test scripts (or sub-set of test scripts) after a build has been identified as a release candidate. The test will verify that functionality has not been broken during the defect fix process and the software is ready for release. Software Quality Assurance identifies which test scripts will be executed and is responsible for obtaining concurrence from the Software Engineering team.

Records of Integration and Regression Tests are maintained in the projects repository in compliance with the Records Matrix.

4.3 Final Regression Tests

Final Regression Tests consist of running Installation Tests as well as Sanity Checks, as applicable. Defects found are entered into the ALM Tool to help with software debugging.

Records of Final Regression Tests are maintained in the projects repository in compliance with the Records Matrix.

4.4 Other Tests

Additional tests may be developed to run such as Installation Tests, Performance Tests, etc. Results from the execution of these tests will be captured in corresponding Test Results spreadsheets. Defects found during these tests will be entered into ALM Tool to help with software debugging.

Records of any other tests developed and executed are maintained in the projects repository in compliance with the Records Matrix.

5 SOFTWARE ENGINEERING PROCESSES

5.1 Software Update

As the Software Quality Assurance performs test and enters the information in the ALM tool, the software team fix problems based on their severity according to the Defect Quadrant Sheet. Development testing is conducted as required in the Project Plan before submitting a new version to Software QA.

5.2 Software Validation

Where applicable, software validation consists of conducting Witness Build by ITA and User Acceptance Test (UAT).
Under these circumstances, the Witness Build process requires the Software Engineering group to submit a Test Plan and submit it to the ITA for sign-off. When requested, the ITA will witness a build of the software at Hart InterCivic’s premises or at a remote location. Recommendation by the ITA is achieved if the software has passed the ITA requirements.