

California Environmental Protection Agency



Air Resources Board

Low Carbon Fuel Standard Program System Development Project Test Plan

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APPROVAL:
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DOCUMENT CONTROL

DOCUMENT APPROVAL HISTORY		
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12/9/2009	0.9	Initial Draft	Jonah Teeter-Balin Doug Buchanan
1/6/2010	1.0	Added: Test team names, test script development schedule, specification matrix and re-formatting	Britt Baysinger
1/7/2010	2.0	Synchronized format of the document to the project management documents. Added revised testing schedule table in Section 4.	Rich Smith
1/8/2010	2.1	Added Test Team Names. Replaced all references to "Beta Testing" with "System/Integration Testing"	Britt Baysinger
1/12/2010	3.0	Added comments and some changes from Christina to the document from "LCFS Reporting Tool Test Plan_czt_edits.docx" and "LCFS Reporting Tool Test Plan v 2 1_czt.doc"	Rich Smith
1/20/2010	4.0	Made updates to finalize plan.	John Gray

1. Test Plan Overview

This test plan covers the LCFS Reporting Tool specific to the Regulated Party user interface (the Tool). The primary goal of this test plan is to validate the Tool meets the requirements set forth in the LCFS Reporting Tool Requirements Documentation 2.0 and additional requirements discussed in prior team meetings. At a minimum the Tool must allow the regulated parties to create and maintain accounts, enter or import fuel data, submit quarterly and annual reports, submit revisions of reports, and maintain credit/deficit balances. The plan will cover three levels of testing: Unit, System/Integration and User Acceptance Testing (UAT) (detailed in Section 3). The timeline for this test plan is expected to be from January 12, 2010 to February 1, 2010. Due to the short timeframe for testing, it may be necessary that some levels of testing, such as UAT and System/Integration testing, overlap.

1.1. Project Team

Table 1-1 Project Team

Project Role	Name
ARB Project Manager	Renee Littaua
ARB Subject Matter Experts (SME)	Greg O'Brian Christina Zhang-Tillman Dickman Lum Steve Brisby
OIS	Sue Smalley, Nate Black
FCCC PM and IT Advisors	Carolyn Borden, John Gray, Duane Cheney, Britt Baysinger
FCCC Project Sponsor	Cindy Stover
FCCC Project Manager	Benjamin Crawford
FCCC .Net Development Team Leader	Blair Varley
FCCC .Net Developer(s)	Ei Ei Hlaing Doug Buchanan
FCCC Test Manager (TM)	Glen Kohlmeister
ARB Test Team	Ray Asregadoo Ron Oineza Marcelle Surovik Jing Yuan Wes Ingram Kamran Adili

Project Role	Name
	Kevin Cleary
	Alan Glabe
	Marcie Pullman
	Stephen d'Esterhazy
	Gregory McMahan

1.2. Product Overview

The Regulated Party Facing Pages of the LCFS Reporting Tool (the Tool) are designed to allow those parties – defined as regulated under ARB’s LCFS guidelines – to submit quarterly and annual reports from 2010 to 2020. The LCFS Regulation requires regulated parties to submit fuel transaction details from which the Tool calculates and stores credit or deficit values. The compliance reports are generated, maintained, and submitted using the Tool. In addition to fuel details, the Tool also maintains a balance sheet for all credits/deficits generated, acquired, sold, and retired under the LCFS program.

1.3. Tracking and Reporting Systems

Defect tracking is managed using an Excel spreadsheet. The spreadsheet is managed by the FCCC Project Manager and available to the project team on BaseCamp. Additional controls include:

- A daily stand-up meeting between the FCCC Project Manager, FCCC Test Manager and FCCC development team will perform the following tasks: review priorities, assign (and re-assign) defects (as necessary). The FCCC Project Manager will reflect any changes in the spreadsheet.
- Defects will be disseminated to the FCCC development team based on development area and priority.
- Updates to the spreadsheet, whether status update or notice of defect correction, will be communicated back to the FCCC Project Manager by the FCCC developer. The FCCC Project Manager will update the spreadsheet as appropriate and will make the defect spreadsheet available for ARB SME review on an agreed schedule.

Change control is managed using SourceGear Vault. For purposes of this test plan, the following additional or supplementary standards will be followed:

- Releases will be managed by the FCCC Development Team Leader. During system/integration testing, the Tool will be updated weekly. When system/integration testing is complete, the Tool will be updated on a scheduled basis.

- Immediately prior to release, all developers will check in all files that are ready to be tested (no in-progress files).
- All files checked in will be labeled with the build number so as to be easily identifiable as a group.
- The FCCC Development Team Leader will build and deploy the latest version to the test server. They will also download a comment report from Vault which will be given to the FCCC Project Manager.
- The FCCC Project Manager will assemble release notes based on the defect management spreadsheet and comment report. The release notes will be given to the ARB SMEs to begin testing.

2. Testing Synopsis

2.1. Items To Be Tested

This test plan shall encompass the entirety of the LCFS Reporting Tool software requirements document, revision 2.0, as well as supporting application functionality that is not in the requirement document which includes

- User login
- Account creation
- Username and Password update
- System messaging
- Email Notification
- Other supporting functionality.

A total of six test scripts validate the software requirements. The naming of these scripts start with “TS” followed by a unique script number and version, example: “TS-01-02” is the second revision of test script one. Each test script focuses on a functional segment of the tool as follows:

- TS-01-xx: Home Page.
- TS-02-xx: Organization Profile.
- TS-03-xx: User Profile.
- TS-04-xx: LCFS Reports.
- TS-05-xx: LCFS Credits.
- TS-06-xx: Security.

A mapping of test scripts to the design specifications is outlined in Appendix B.

2.2. Items NOT To Be Tested

- Any items in the requirements document which would be deemed ARB-facing pages.
- LCFS transfer and trading credit transactions only. Credit generation, balance and summary will be tested.

2.3. System and Software Requirements

- There are no special system requirements for completing testing other than an internet-enabled system using Internet Explorer 67.0+, Firefox 3.5+, and Safari. Testing will focus on Internet Explorer 8.0, Internet Explorer 7.0, and Firefox 3.5. If users currently have older browser versions (e.g. Internet Explorer 6.0) they will be advised to upgrade. If time permits, testing will be performed on Safari because a few ARB users have Apple desktops and Safari is the Apple browser.

- A valid XML document prepared according to the published XSD is required to test the XML file upload portion of the Tool.

2.4. Test Environment and Access

Unit testing will be performed by FCCC Developers on their developer workstations.

System/Integration Testing will be performed by FCCC Test Manager and other FCCC staff on the FCCC Development server. The Development Server will function as a web server and a database server.

System/Integration Testing will also be performed by ARB Test team on the FCCC Test Server. The Test Server will function as a web server and a database server.

FCCC will control access to the Development Server and Test Server.

User acceptance testing will be performed by industry focus group users on the ARB Acceptance Test servers which include a separate web server and database server which is the same configuration as the production environment.

ARB administrators will control access to the web server and database server. Users will not have access to the database server. Only ARB users will have access to the ARB Facing Pages on the web server. Industry focus group users (Regulated Parties) will have access to the ARB Facing Pages.

The System Implementation Plan includes more details about the hardware and software within the test environments.

2.5. Reference Material

- LCFS Reporting Tool Design Specifications document.
- LCFS Reporting Tool System/Integration Test Cases.
- Defect Management worksheet.
- LCFS System Implementation Plan.

3. Types of Testing

3.1. Unit Testing

Unit testing will be done by each developer and approved by the FCCC Development Team Leader. Proof of unit testing will be verified by the FCCC Development Team Leader prior to unit testing being accepted and passed on to the testing team.

3.2. System/Integration Testing

System/Integration Testing will be performed by the FCCC Test Manager and FCCC Development Team Leader with assistance from individual developers as required. This phase of testing will begin after a new build is deployed to the test system. FCCC staff conducting testing will immediately notify the FCCC Test Manager of any high priority defect upon discovery.

ARB Testers will also perform System/Integration testing within the FCCC Test Environment and will report defects to the FCCC Test Manager on a daily basis.

System/Integration testing will follow the Functional Test Cases document (Appendix A) and results of this will be delivered to the FCCC Project Manager, FCCC Test Manager and project stakeholders for verification and sign-off and final acceptance testing.

3.3. Acceptance Testing

Acceptance Testing will be performed by industry focus group end-users within the Acceptance Test Environment. UAT will be performed after System/Integration testing and will not have any test scripts as individual organization will test/use the system based on their business needs. Defects and functionality questions identified by industry focus group end-users will be gathered by ARB Subject Matter Experts (ARB SMEs) and reviewed. ARB SMEs will review these defects and questions to determine which are defects (situations where the application does not meet requirements) and which are change requests (situations where the application meets current requirements but the users have identified functionality that should be added to a future version of the application). Defects will be reported to the FCCC Test Manager on a daily basis.

3.4. Performance Testing

There are many different terms used for similar types of testing, including stress testing, volume testing, performance testing, and load testing. This section uses the term performance testing as term to cover testing that determines if the system can process the anticipated number of users, quantity of data, with reasonable response times.

Performance testing will be performed at a later date, once additional project funding has been obtained. This section captures current project thinking about Performance Testing.

A separate environment for Performance Testing is not necessary. Performance testing may be performed in the Acceptance Test Environment after the industry focus group acceptance testing is complete.

Performance testing will focus on determining if the system can support the anticipated medium to large volumes of data, especially around the report due dates, as well as the anticipated number of users. Ideally, performance testing will include 1) large volume with a small number of users, 2) large volume with a large number of users, 3) small volume with a large number of users.

The initial testing focus for the project has been to stabilize the application with the appropriate functional behavior to allow industry focus group acceptance testing to occur. Once additional project funding is obtained the project team will revisit performance testing and develop a more detailed performance test plan, test scripts, data, and an approach that will allow performance tests to be performed in a methodical, repeatable manner, that allows optimizations to be made (e.g. changing server parameters, adding database indexes) and tests to be re-executed.

4. Test Schedule and Resources

There should be at least one (1) full time FCCC tester for system/integration testing. If a dedicated tester is unavailable, this role will be filled by the FCCC Test Manager. The FCCC development team needs to be available for questions on a daily basis and plan for at least 2-3 in person or teleconference meetings per week with the ARB SMEs.

The FCCC Project Manager and FCCC Test Manager will manage the defects and work with the development team to prioritize and fix defects for the successive iterations.

The following table outlines the target completion dates for developing, reviewing and releasing the initial system test scripts.

Table 1-2 Target Completion Dates

Test Script	Function	Draft	Initial Review	Final Draft	Release to Testers
TS-01	Home Screen	8-Jan	12-Jan	13-Jan	21-Jan
TS-02	Organization Profile	8-Jan	12-Jan	13-Jan	21-Jan
TS-03	User Profile	8-Jan	12-Jan	13-Jan	21-Jan
TS-04	Reports	12-Jan	13-Jan	14-Jan	21-Jan
TS-05	Credits	14-Jan	15-Jan	18-Jan	21-Jan
TS-06	Security	15-Jan	15-Jan	18-Jan	21-Jan

It is estimated that each iteration of unit and system/integration testing will take approximately 3-5 days. This includes a full regression test of the web interface.

The following are risks that may impact the successful completion of Test Plan activities within timelines noted above:

- Inadequate test or development resources (including, but not limited to, people, hardware, etc.).
- Significant changes to the test plan after approval.
- Changes to the LCFS RT Requirements Documentation 2.0.
- Not all requirements are documented in LCFS RT Requirements Documentation 2.0. Additional functionalities such as account creation and management, system error/exception notification, system messaging, email notifications, and roles and privileges are not contained in the LCFS RT Requirements Documentation 2.0.

5. Test Cases and Completion Criteria

The planned testing has the following milestones in addition to the weekly releases:

- Internal FCCC system/integration testing to be completed by 1/09/2010. This phase is considered completed when all scripts have been run and no high priority defects remain in open status.
- ARB system/integration testing to be completed by 1/23/1010. This testing will be performed by ARB staff. Test feedback and comments will be consolidated and submitted to the ARB Project Lead for review. This phase cannot be considered complete until all scripts have been run and no high priority defects remain in open status. This phase can be considered complete with medium priority and low priority defects remaining open. However, the quantity of open medium priority and low priority defects that is acceptable will be determined by ARB Project Leads and the ARB Project Manager.
- Regulated parties will conduct the UAT. They will submit comments to a designated ARB SME. This phase cannot be considered complete until all scripts have been run and no high priority defects remain in open status. This phase can be considered complete with medium priority and low priority defects remaining open. However, the quantity of open medium priority and low priority defects that is acceptable will be determined by ARB Project Leads and the ARB Project Manager.
- Release to Production will occur at a date that will be determined once the project receives additional funding.

5.1. Unresolved Issues and Risks

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5.2. Test Plan Review

Project team will review, modify and accept the test plan as expeditiously as possible.

APPENDIX A: FUNCTIONAL TEST CASES

Document to be included.

APPENDIX B: FUNCTIONAL SPECIFICATION MATRIX

The following table outlines the design specifications the test scripts validate. Some system functional segments were designed through an iterative process; these segments were not detailed within documented design specifications. Rather represent design solutions agreed upon within FCCC and ARB joint application design (JAD) sessions.

Test Script	Functional Segment	Functional Specifications
TS-01	Home Page	Design specifications identified through an iterative model and not contained in the Design Specifications document.
TS-02	Organization Profile	Design specifications identified through an iterative model and not contained in the Design Specifications document.
TS-03	User Profile	Design specifications identified through an iterative model and not contained in the Design Specifications document.
TS-04	LCFS Reports	Design Specifications document v2 sections: 1, 2, 3,4 and 5
TS-05	LCFS Credits	Design Specifications document v2 sections: 6 and 7
TS-06	Security	Design specifications identified through an iterative model and not contained in the Design Specifications document.