



Airworthiness Certification Services LLC

Software Verification Cases and Procedures and Verification Results for the

Process and Artifact Compliance Tool

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1.0 INTRODUCTION

1.1 Purpose

This document identifies the software verification cases and procedures and verification results for the Process and Artifact Compliance Tool (PACT). It contains both normal-range and robustness test cases. This document has been prepared in accordance with the requirements of RTCA/DO-178B.

1.2 Scope

This document will be used by the certification authority to verify that the product meets the requirements defined in the Software Requirements Document. This document complies with the requirements of RTCA/DO-178B, Sections 11.13 and 11.14.

1.3 Acronyms and Abbreviations

PACT	Process and Artifact Compliance Tool
GITLAB	GitLab Repository

1.4 Applicable Documents

The following documents are listed for reference only. Each document is applicable to this plan only to the extent specified herein.

1.4.1 External Documents

RTCA/DO-178B	Software Considerations in Airborne Systems and Equipment Certification
FAA Order 8110.4C	Type Certification
FAA Order 8110.49	FAA, Software Approval Guidelines
AC 20-115B	Advisory Circular, RTCA Inc., Document DO-178B, Software Considerations in Airborne Systems and Equipment Certification

1.4.2 Internal Documents

1.5 General Test and Data Completion Requirements

Verify that you have the latest revision of this procedure, and the latest revision of any required reference documents.

Locate the test equipment and software listed in paragraphs 2.4 and 2.5. List all test equipment and software used in the Test Equipment and Software Chart located in paragraphs 2.4 and 2.5.

After each test case has been completed, enter the Date Completed on the Test Procedure and Verification Results Record and place any additional test data or printouts behind the Appendix A Title Page.

Review the Test Procedure and Verification Results Record for any out of spec. entries and missing entries. Enter NA where a test step does not apply. Enter the word "none" or a dash in results spaces for steps that apply but for which there is no data to be recorded. The Verification Results Record package (identified below) should then be provided to the individual responsible for reviewing the verification results.

The Verification Results Record will consist of the following items:

- 2.0, Summary Test Report including:
- 2.1, Test Completion Record
- 2.2, Unit Under Test Identification (Verification Test)
- 2.3, Unit Under Test Identification (Production Test)
- 2.4, Test Equipment and Materials
- 2.5, Equipment Configuration & Test Case Setup Instructions
- 2.6, Test Conditions
- 2.7, Verification Test Log
- All test cases, including Production Test Case
- Appendix A, Verification Results Record Attachments

The Verification Results Record package will then be provided to Quality Assurance for safekeeping.

2.0 SUMMARY TEST REPORT

2.1 Test Completion Record

The Quality Assurance Engineer will indicate acceptance of each test case after all test cases have been completed.

Section	Test Case	Pass	Fail	Date Started	Date Completed	SQA Stamp
3.0	Software Load Control					
4.0	Initialization					
5.0	Basic Operations					

2.2 Sections Under Test (Quality Verification Test)

Section Name	Test Case	Mod Dot Number	Software Revision	Tested By
Documents	TC-0001			
Reviews	TC-0002			

2.3 Sections Under Test (Production Test)

Section Name	Test Case	Mod Dot Number	Software Revision	Tested By
Documents	TC-0001			
Reviews	TC-0002			

2.4 Test Equipment

Description	Cal. Required
MacBook Pro (2015 or greater) with 16 GB Memory, 250 GB of storage or a Intel Based PC with a Pentium i7 Processor or better and 16 GB Memory, 250 GB of storage.	NA

2.5 Test Software

Description	Version
MacOS Catalina or Microsoft Windows 10 Pro or Ubuntu Linux	10.15.6 10.0.1863 18.04.5 LTS
Ruby	2.6.3p62
Rails	5.2.4.1
Chrome Driver	84.0.4147.30
Selenium Web Driver	3.142.7
Git	2.21.0
PostgreSQL	9.4.3
Puma	3.12.6
ImageMagick	6.5.9-10
Chrome	84

2.6 Equipment Configuration & Test Case Setup Instructions

	Standard Set-Up Instructions	Verified
1	Log onto the computer.	NA
2	Open a terminal window (Mac/Linux) or a PowerShell window (Windows).	NA
3	Execute export RAILS_ENV='test' (Mac/Linux) or \$env:RAILS_ENV='test' (windows).	NA
4	Install all required supporting software, if not already installed. See section 2.5.	NA
5	If the software has not already been loaded for testing, load the software using the following procedure in the next paragraph. If the repository is already cloned, pull the current version of the software from the repository (git pull), otherwise clone the Git Repository from https://gitlab.faaconsultants.com/pact/pact.git .	NA
6	Change to the repository directory. Skip all the remaining steps if the software has already been loaded for testing previously.	NA
6	Execute bundle install .	NA
8	Execute bundle install .	NA
9	Execute bundle exec rake db:create , if the database has not been created previously.	NA
10	Execute bundle exec rake db:migrate	NA
11	Execute bundle exec rake db:seed	NA

2.7 Verification Test Log

For each failure or observation, enter a sequential number beginning with 01 and enter requested information in each column of the log.

Place attachments, if any, behind Appendix B Title Page.

#	Date	Time	Test Procedure Section	Remarks
01			1.0	Start of Test

3.0 SOFTWARE LOAD CONTROL

3.1 Purpose

The purpose of this section is to verify that the correct code is loaded into the equipment and has been done so independently with the appropriate safeguards. This process begins with verification that the source code is checked-in and Labeled in GitLab Repository. The version assigned to the release software is verified.

3.2 Software Configuration Instructions

Step	Set-Up Instruction	Verified
1	Use Standard Setup #1 - See Section 2.6 if the software was not previously loaded.	NA
2	Execute cat config/initializers/version.rb	NA
3	Verify that the version of the code is as expected.	NA

3.3 Performance and Verification Results Record

Date Started: _____ Performed By: _____

Date Completed: _____

Step	Test Description	Action	Actual Results
01	Are the following steps being performed by an individual independent of the software developer?	YES / NO	
02	Verify that the sources are released into the GitLab Repository and have a Label.	CHECK	
03	Record the version number of the software.	RECORD	
04	Use Standard Setup #1 - See Section 2.6.	CHECK	
05	Execute rails test scriptname where <i>scriptname</i> is the name of the script for this test procedure.	CHECK	
06	Record the final results of the procedure.	PASS/ FAIL	

4.0 INITIALIZATION TEST

4.1 Purpose

The purpose of this test is to verify that, on startup, the server and software will begin without error. This test case was developed to satisfy both Requirements and Robustness Testing, as defined in RTCA/DO-178B. This test case takes approximately 10 minutes to complete (if all supporting software is already installed).

4.2 Test Equipment

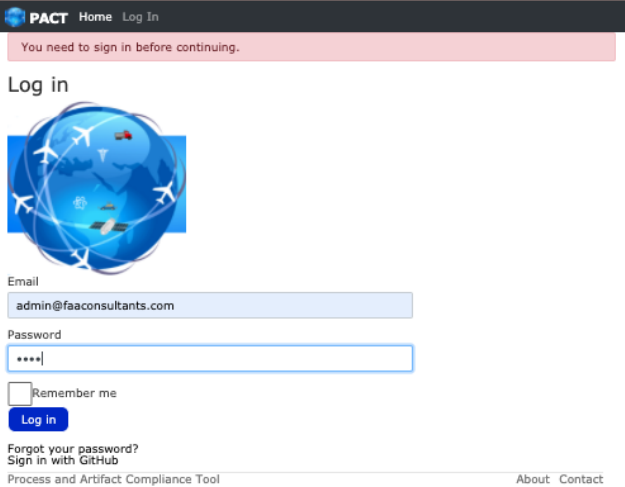
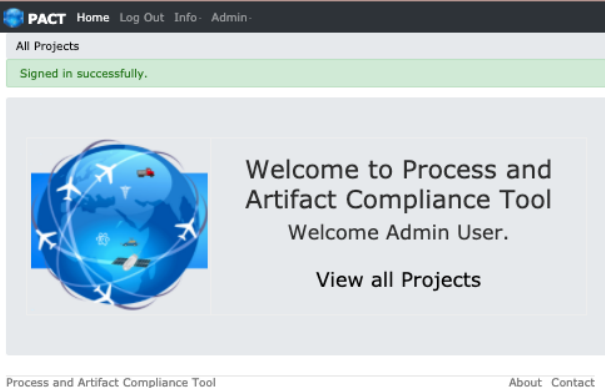
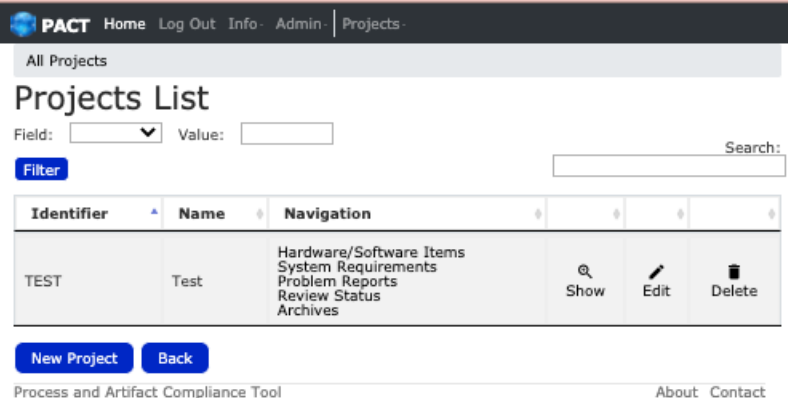
Description	Cal. Required
MacBook Pro (2015 or greater) with 16 GB Memory, 250 GB of storage or a Intel Based PC with a Pentium i7 Processor or better and 16 GB Memory, 250 GB of storage.	NA

4.3 Test Software

Description	Version
Rails	5.2.4.1
Chrome	84

4.4 Equipment Configuration & Test Case Setup Instructions

Initial Set-Up Instructions	Verified
Use Standard Setup #1 - See Section 2.6 if the software was not previously loaded.	NA
Execute rails s and check for any error messages.	
Open your browser. Browse to http://localhost:3000/?organization=test . Check for any error messages.	

<p>Log in using admin@faaconsultants.com for the email and test for the password.</p> 	
<p>Verify that the screen is similar to</p> 	
<p>Click on View all Projects and verify that the screen is similar to</p> 	
<p>Record the Results</p>	

4.5 Test Procedure and Verification Results Record

Date Started: _____ Tested By: _____

Date Completed: _____

Step	Test Description	Action	Actual Results
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

5.0 REQUIREMENTS-BASED TEST CASES AND PROCEDURES

5.1 Documents Section Test

Test Case: TC-0001

Test Procedures: TP-0001, TP-0002, TP-0003, TP-0004, TP-0005, TP-0006, TP-0007

5.1.1 Test Objective

The objective of the following test procedures is to verify that the PACT handles Document Management Properly as specified in System Requirement SYS-00001. This will be accomplished through the following scenarios:

1. Power on Computer if not powered on and log in.
2. Open a terminal (Mac/Linux) or PowerShell (Windows).
3. Change to the repository directory.
4. Execute **rails test test script specified in test procedure.**
5. Record results.

5.1.2 Test Coverage

Test Procedure No.	Test Scripts	Test Type	Requirement(s) Tested
Procedure 001	test/models document_test.rb	Normal	SYS-001000, HLR-0001, HLR-0002, HLR-0003, HLR-0004, HLR-0005, HLR-0006, HLR-0007
Procedure 002	test/controllers documents_controller_test.rb	Normal	SYS-001000, HLR-0001, HLR-0002, HLR-0003, HLR-0004, HLR-0005, HLR-0006, HLR-0007
Procedure 003	test/system documents_test.rb	Normal	SYS-001000, HLR-0001, HLR-0002, HLR-0003, HLR-0004, HLR-0005, HLR-0006, HLR-0007

Additional Information

Assumptions:

Standard Setup #1 has been completed successfully - See Section 2.6

Constraints:

None.

Special Requirements:

None.

Other Information:

None.

5.1.3 Execution Summary

Setup Identification

Test Date: _____

Test Operator: _____

Test Support Equipment: _____

Test Setup: _____

Software Under Test: _____

Comments and Notes

Procedure Results

Check FAIL if the results of any verify statement in this test procedure produced a fail.
Otherwise, check PASS.

PASS _____ FAIL _____

Optional Comment:

Signatures

Executed By: _____

APPENDIX A

VERIFICATION RESULTS RECORD ATTACHMENTS

(Place Verification Results Record attachments behind this page.)