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# TEST REPORT

## NATIONAL CERTIFICATION TEST REPORT

### CERTIFICATION TESTING OF THE DOMINION DEMOCRACY SUITE VERSION 4.14-B VOTING SYSTEM

for

**Dominion Voting Systems, Inc.**  
 1201 18th Street, Suite 210  
 Denver, Colorado 80202

STATE OF ALABAMA }  
 COUNTY OF MADISON }

Robert D. Hardy, Department Manager, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted testing and is to the best of his knowledge true and correct in all respects.

Robert Hardy

SUBSCRIBED and sworn to before me this 12 day of Dec 20 13

Sandra A. Daniel  
 Notary Public in and for the State of Alabama at Large

My Commission expires June 2, 2015

**SEAL**

Wyle shall have no liability for damages of any kind to person or property, including special or consequential damages, resulting from Wyle's providing the services covered by this report.

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**TABLE OF CONTENTS**

	<u>Page No.</u>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 Scope.....	1
1.2 Objective.....	2
1.3 Test Report Overview.....	2
1.4 Customer.....	2
1.5 References.....	2
<b>2.0 SYSTEM IDENTIFICATION AND OVERVIEW.....</b>	<b>4</b>
2.1 System Overview.....	4
2.2 System Identification.....	4
2.2.1 Hardware.....	4
2.2.2 Software.....	5
2.3 Test Support Materials.....	7
2.4 Vendor Technical Data Package.....	7
2.5 Deliverable Materials.....	8
2.6 End User Documentation.....	8
<b>3.0 TEST BACKGROUND.....</b>	<b>8</b>
3.1 General Information.....	8
3.2 Testing Scope.....	9
3.3 Wyle Quality Assurance.....	9
3.4 Test Equipment and Instrumentation.....	9
3.5 Terms and Abbreviations.....	10
<b>4.0 TEST PROCEDURES AND RESULTS.....</b>	<b>12</b>
4.1 System Level Testing.....	12
4.1.1 Physical Configuration Audit.....	12
4.1.2 Functional Testing.....	13
4.2 Source Code Review.....	14
4.3 Witnessed Build.....	14
4.4 Technical Data Package Review.....	15
4.5 Engineering Change Order (ECO) Analysis.....	15
4.6 Anomalies and Resolutions.....	16

**APPENDICES**

<b>APPENDIX A PHOTOGRAPHS.....</b>	<b>A-1</b>
<b>APPENDIX B WYLE'S CERTIFICATION TEST PLAN AS RUN NO. T71372.01-01.....</b>	<b>B-1</b>
<b>APPENDIX C NOTICES OF ANOMALY.....</b>	<b>C-1</b>

## **1.0 INTRODUCTION**

### **1.1 Scope**

This report presents the test results for compliance testing of the Dominion Voting Systems Democracy Suite 4.14-B Voting System. Dominion Voting Systems submitted the voting system to Wyle Laboratories, Inc. for compliance testing to the Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG). The Democracy Suite 4.14-B Voting System is a modification to the Democracy Suite 4.14-A Voting System certified by the EAC on September 20, 2013 (Dem-Suite-4-14-A). All testing on the modifications to the voting system was conducted in accordance with the EAC 2005 VVSG.

Note: The Democracy Suite 4.14-A (DemSuite-4-14-A) Voting System is an upgrade to the Democracy Suite 4.14 (DemSuite-4-14) Voting System, which is itself an upgrade to the Democracy Suite 4.0 (DVS-40-G-10) Voting System.

The focus of this test campaign was to test the submitted modifications to the system since the last certification. Wyle Laboratories performed functional testing and Engineering Change Order (ECO) Analysis to verify all changes submitted for this upgrade.

This report is valid only for the system modifications identified below. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to the EAC to determine if this system modification requires a new application, or can be re-submitted as a newly-modified system. The scope of testing required was determined based upon the degree of modification.

The upgraded features submitted as part of the Democracy Suite 4.14-B Voting System modification are listed below:

1. Acclaimed Contest Behavior: ImageCast Evolution and ImageCast Precinct application software has been updated to change the system's behavior when handling "acclaimed contests."
2. Engineering Change Orders (ECOs): ECOs that have been integrated into the latest production build of the ImageCast Evolution (ICE) precinct ballot tabulator and the ImageCast Evolution ballot box.

This modification includes hardware changes to the ImageCast Evolution PCOS-410A precinct ballot counter and the ImageCast Evolution Plastic Ballot Box. The changes to the ImageCast Evolution precinct ballot counter include changes to the Approved Vendors List, design changes for ease of manufacturing such as changes in tolerances or removing material on a bend, drawing or production document changes, and part changes such as adding a tie wrap to a wire saddle to prevent cables from rubbing against metal edges. The changes to the ImageCast Evolution Plastic Ballot Box include changes to the Approved Vendor List, design changes for ease of manufacturing such as changes to materials and tolerances, and part changes such as changing the profile of a bracket or removing a return spring hole. These hardware changes are provided in their entirety in Appendix A of Wyle Laboratories' Certification Test Plan As Run No. T71372.01-01 located in Appendix B of this document.

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**1.0 INTRODUCTION (Continued)**

**1.2 Objective**

The Democracy Suite 4.14-B Voting System was tested to all applicable EAC 2005 Voluntary Voting Systems Guidelines (VVSG).

**1.3 Test Report Overview**

This test report consists of four main sections and appendices:

- 1.0 Introduction – Provides: the architecture of the National Certification Test Report (hereafter referred to as Test Report); a brief overview of the testing scope of the Test Report; a list of documentation, customer information, and references applicable to the voting system hardware, software and this test report.
- 2.0 System Identification and Overview – Provides information about the system tested that includes the system’s name and major subsystems, test support hardware, and specific documentation provided by the vendor used to support testing.
- 3.0 Test Background – Contains information about the certification test process and a list of terms and nomenclature pertinent to the Test Report and system tested.
- 4.0 Test Procedures and Results – Provides a summary of the procedures and results of the testing process.
- Appendices– Information supporting reviews and testing of the voting system are included as appendices to this report. These include Photographs, the as-run Certification Test Plan, and Notices of Anomaly.

**1.4 Customer**

Dominion Voting Systems  
1201 18<sup>th</sup> Street, Suite 210  
Denver, Colorado 80202

**1.5 References**

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, “Voting System Performance Guidelines,” and Volume II, Version 1.0, “National Certification Testing Guidelines,” dated December 2005
- Election Assistance Commission Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007
- Election Assistance Commission Voting System Test laboratory Program Manual, Version 1.0, effective date July 2008

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**1.0 INTRODUCTION (Continued)**

**1.5 References (Continued)**

- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, “NVLAP Procedures and General Requirements (NIST Handbook 150),” dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, “Voting System Testing (NIST Handbook 150-22),” dated May 2008
- United States 107<sup>th</sup> Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories’ Quality Assurance Program Manual, Current Revision
- Wyle Laboratories Quality Assurance Manual, Current Revision
- ANSI/NCSL Z540-1, “Calibration Laboratories and Measuring and Test Equipment, General Requirements”
- ISO 10012-1, “Quality Assurance Requirements for Measuring Equipment”
- EAC Requests for Interpretation (listed on [www.eac.gov](http://www.eac.gov))
- EAC Notices of Clarification (listed on [www.eac.gov](http://www.eac.gov))
- EAC Quality Monitoring Program residing on:  
[http://www.eac.gov/testing\\_and\\_certification/quality\\_monitoring\\_program.aspx](http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx)
- Dominion Voting Systems’ Democracy Suite 4.0 VSTL Certification Test Report Rev. A (listed on [www.eac.gov](http://www.eac.gov))
- Dominion Voting Systems Democracy Suite 4.0 Technical Data Package
- Dominion Voting Systems’ Democracy Suite 4.14 Modification VSTL Certification Test Report Rev. C (listed on [www.eac.gov](http://www.eac.gov))
- Dominion Voting Systems Democracy Suite 4.14 Technical Data Package
- Dominion Voting Systems’ Democracy Suite 4.14-A Modification VSTL Certification Test Report Rev. B (listed on [www.eac.gov](http://www.eac.gov))
- Dominion Voting Systems Democracy Suite 4.14-A Technical Data Package

A listing of the Democracy Suite 4.14-B Voting System Technical Data Package (TDP) Documents submitted for this test effort is listed in Section 2.4, “Vendor Technical Data Package.”

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## 2.0 SYSTEM IDENTIFICATION AND OVERVIEW

### 2.1 System Overview

The Democracy Suite 4.14-B Voting System is a modification to the certified Democracy Suite 4.14-A Voting System. The full Democracy Suite 4.14-A System description can be found in Section 2.0 of Wyle Laboratories' Test Report, Revision B for Dominion Voting Systems Democracy Suite 4.14-A National Certification. For the full Democracy Suite 4.14 System description, reference Section 2.0 of Wyle Laboratories' Test Report, Revision C for Dominion Voting Systems Democracy Suite 4.14 National Certification. The full Democracy Suite 4.0 System description can be found in Section 2.0 of Wyle Laboratories' Test Report, Rev A for Dominion Voting Systems Democracy Suite 4.0 National Certification. For the Democracy Suite 4.14-B Voting System, Wyle Laboratories tested the modifications listed in Section 1.1 of this report.

### 2.2 System Identification

The materials required for testing of the Democracy Suite 4.14-B Voting System included hardware and test materials shipped directly to Wyle Laboratories by Dominion Voting Systems. The materials documented in the following sections are the materials used during Wyle Laboratories' testing of the modifications.

#### 2.2.1 Hardware

This subsection categorizes the equipment the manufacturer submitted for testing listed in Table 2-1. Each test element is included in the list of equipment required for testing of that element, including system hardware and any required test instrumentation.

**Table 2-1 Democracy Suite 4.14-B Voting System Equipment Description**

Equipment	Manufacturer	Version/Model	Specifications	Serial Number
PC1	Dell	Latitude E6530	Intel Core i5 CPU M580 @ 2.67GHz 4.00 GB Installed RAM HD Capacity 250 GB	2779CW1

**Table 2-2 Democracy Suite 4.14-B COTS Voting System Support Equipment Description**

Test Material	Make	Model	Quantity	Serial Number
iButton (SHA-1) with USB Reader/Writer	Maxim	USB R/W: DS9490R iButton: DS1963S	1	51DFD
iButton (SHA-1)	Maxim	DS1963S	3	n/a
Compact Flash Card Reader	SanDisk	SDDR-92-A15	1	0171630
Compact Flash Cards	RiData	CFC-14A	10	n/a

**2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)**

**2.2.1 Hardware (Continued)**

**Table 2-3 Democracy Suite 4.14-B Voting System Equipment**

<b>Equipment</b>	<b>Description</b>	<b>Serial Numbers</b>
ImageCast Precinct (ICP)	Precinct Count Optical Scanner	AANAGCP0265
ImageCast Precinct (ICP)	Precinct Count Optical Scanner	WLDAFBH0023
ImageCast Evolution (ICE)	Precinct Count Optical Scanner	AAFEBDW0117
ImageCast Evolution (ICE)	Precinct Count Optical Scanner	ICE2P200004
ICE Plastic Ballot Box	Secure Plastic Ballot Box with applied ECO's	AAUCBDQ0074
ICE Metal Ballot Box	Secure Metal Ballot Box	BOX-57381-015
ICP Metal Ballot Box	Secure Metal Ballot Box	BOX-57381-014
ICP Metal Ballot Box	Secure Metal Ballot Box	BOX-57381-011

**2.2.2 Software**

Software evaluation of ImageCast Evolution Firmware Ver. 4.14.13 and ImageCast Precinct Firmware Ver. 4.14.9-US was included in the Democracy Suite 4.14-B test campaign. The software listed in Table 2-4 was utilized during the functional testing. Except for ImageCast Precinct Firmware Ver. 4.14.9-US and ImageCast Evolution Firmware Ver. 4.14.13, all other software was previously-certified during the Democracy Suite 4.14 and Democracy Suite 4.14-A test campaigns.

**Table 2-4 Democracy Suite 4.14-B EMS Software Platform Components**

<b>Software Required For Testing</b>	<b>Software Version</b>	<b>Filename</b>
Democracy Suite EMS EED Client Application	4.14.23	setup.exe, EED_FED_CERT.Setup_64b.msi
Democracy Suite EMS RTR Client Application	4.14.23	setup.exe, RTR_FED_CERT.Setup_x64.Setup.msi

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2.2 Software (Continued)

Table 2-5 Democracy Suite 4.14-B ImageCast Precinct Software Components

Software Required For Testing	Software Version	Filename
Election Firmware	4.14.9-US	cf2xx.sig
Firmware Updater	4.14.9-US	firmUp.enc
Firmware Extractor	4.14.9-US	FirmwareExtract.enc
Kernel (uClinux)	4.14.9-US	Image.bin.gz
Boot Loader (COLILO)	20040221	colilo.bin

Table 2-6 Democracy Suite 4.14-B ImageCast Evolution Software Components

Software Required For Testing	Software Version	Filename
Voting Machine	4.14.13	GApplication-4.14.13.vhd.7z
Election Application	4.14.13	dvs
Linux Kernel	2.6.30.9-dvs-21	uImage
Linux Device File	1.3	mpc8347dvs.dtb
Root File System	1.0.6	rfs
Ram Disk	1.0.1	initrd.img
Boot Startup Logo	4.0.0	logo_platform.bmp
Linux Startup Logo	4.0.0	logo_os.bmp
Boot Loader	1.3.4.29	u-boot.bin
Motherboard FPGA	1.1.5	ice2_mc_p1.bit
Scanner Board FPGA	1.1.2	ice2_scb_p2.bit
Logger Controller	1.0.11	logger.bin
Power Controller	2.0.7	power.bin
Integrated Printer	4.1.6	integratedPrinter.hex, printerFont.hex

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**2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)**

**2.3 Test Support Materials**

This subsection enumerates any and all test materials needed to perform voter system testing. The scope of testing determines the quantity of a specific material required.

The test materials in Table 2-7 are required to support the Democracy Suite 4.14-B certification testing:

**Table 2-7 Democracy Suite 4.14-B Test Support Materials**

<b>Test Material</b>	<b>Manufacturer/Description</b>	<b>Quantity</b>
ATI Handset	Dominion	2
Memory Flash Cards	RiData	10
Standard Paper Ballots	Dominion	30
Permanent Markers	p/n SHARPIE1 BK	2
Thermal Printer Rolls	ICP/ICE Paper Rolls	4
Election Tamper Evident Seals (Red)	NovaVision/2X9"	20
Election Tamper Evident Seals (Red)	NovaVision/.75X2.5"	20
Tamper Evident Tie Wrap	Dominion	10
Sanitary Headphone Cover	Dominion	2

**2.4 Vendor Technical Data Package**

The Technical Data Package (TDP) contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC 2005 VVSG requirements state, that at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

The document listed in Table 2-8 comprises the Democracy Suite 4.14-B Voting System TDP. This document is considered an addendum to the Democracy Suite 4.14 and Democracy Suite 4.14-A voting system's TDP, certified by the EAC on July 18, 2013 (Dem-Suite-4-14) and September 20, 2013 (DemSuite-4-14-A) respectively.

**Table 2-8 Democracy Suite 4.14-B Voting System TDP**

<b>Democracy Suite 4.14-B TDP Document</b>	<b>System</b>
Dominion Voting Systems Democracy Suite 4.14-B TDP Addendum	Democracy Suite 4.14-B

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## 2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

### 2.5 Deliverable Materials

The materials listed in Table 2-9 are identified by Dominion Voting Systems to be delivered as part of the Democracy Suite 4.14-B Voting System to the end users.

**Table 2-9 Democracy Suite 4.14-B Voting System Deliverables**

<b>Deliverable Material</b>	<b>Version</b>	<b>Description</b>
ImageCast Evolution (ICE), precinct ballot counter	PCOS-410A	ImageCast Evolution, precinct ballot counter with applied ECO's and Firmware ver. 4.14.13
ICE Plastic Ballot Box	BOX-410A	ImageCast Evolution Plastic Ballot Box with applied ECO's
ImageCast Precinct (ICP) Firmware	4.14.9-US	Firmware version 4.14.9-US, for the ImageCast Precinct ballot counter.

### 2.6 End User Documentation

The following document constitutes the deliverable to the end user at election central:

- Dominion Voting Systems Democracy Suite 4.14-B TDP Addendum

## 3.0 TEST BACKGROUND

Wyle Laboratories is an independent testing laboratory for systems and components under harsh environments, including dynamic and climatic extremes as well as the testing of electronic voting systems. Wyle Laboratories holds the following accreditations:

- ISO-9001:2000
- NVLAP Accredited ISO 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 845.01, 845.02, and 845.03)
- FCC Approved Contractor Test Site (Part 15, 18, 68)

### 3.1 General Information

All testing performed as part of the test effort was performed at Wyle Laboratories' Huntsville, Alabama facility. Certification testing included: the inspection and evaluation of voting system documentation, and operational tests verifying system performance and function under normal and abnormal conditions. Qualification/Certification testing was limited to the Dominion Voting Systems, Inc. Democracy Suite Version 4.14-B Voting System, which includes the items listed in Section 2.0 of this test report.

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### **3.0 TEST BACKGROUND (Continued)**

#### **3.2 Testing Scope**

To evaluate the system test requirements and the scope of the test campaign, each section of the EAC 2005 VVSG was analyzed to determine the applicable tests. The EAC 2005 VVSG Volume I Sections, along with the strategy for evaluation, are described below:

- Section 2: Functional Requirements – The requirements in this section were tested during the Functional Test utilizing test cases specially designed for the Democracy Suite 4.14-B Voting System.
- Section 3: Usability and Accessibility – The requirements in this section were deemed not applicable therefore were not tested during this test campaign.
- Section 4: Hardware Requirements – The requirements in this section were deemed not applicable therefore were not tested during this test campaign.
- Section 5: Software Requirements – The requirements in this section were tested during source code review, TDP review, and functional testing. A combination of review and functional testing was performed to ensure these requirements were met.
- Section 6: Telecommunication – The requirements in this section were deemed not applicable therefore were not tested during this test campaign.
- Section 7: Security Requirements – The requirements in this section were deemed not applicable therefore were not tested during this test campaign.
- Section 8: Quality Assurance (QA) Requirements – The QA requirements were spot checked and limited to only the changes included within this modification.
- Section 9: Configuration Management (CM) Requirements – The CM requirements were spot checked and limited to only the changes included within this modification.

#### **3.3 Wyle Quality Assurance**

All work performed on this program was in accordance with Wyle Laboratories' Quality Assurance Program and Wyle Laboratories' Quality Program Manual, which conforms to the applicable portions of International Standard Organization (ISO) Guide 17025.

The Wyle Laboratories, Huntsville Facility, Quality Management System is registered in compliance with the ISO-9001 International Quality Standard. Registration has been completed by Quality Management Institute (QMI), a Division of Canadian Standards Association (CSA).

#### **3.4 Test Equipment and Instrumentation**

All instrumentation, measuring, and test equipment used in the performance of this test program was calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL 2540-1, ISO 10012-1, and ISO/IEC 17025. Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards, or the basis for calibration is otherwise documented.

**3.0 TEST BACKGROUND (Continued)**

**3.5 Terms and Abbreviations**

Table 3-1 defines all terms and abbreviations applicable to this Test Report.

**Table 3-1 Terms and Abbreviations**

Term	Abbreviation	Definition
Americans with Disabilities Act of 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Audio Studio	AS	EMS application used to record audio files.
Audio Tactile Interface	ATI	Voter interface designed to not require visual reading of a ballot. The same ATI is utilized for both the ICP and ICE.
Conformité Européenne (European Conformity)	CE	---
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware devices (such as card readers, printers or personal computers) or software products (such as operating systems, programming language compilers, or database management systems)
Direct Record Electronic	DRE	An electronic voting system that utilizes electronic components for the functions of ballot presentation, vote capture, vote recording, and tabulation which are logically and physically integrated into a single unit. A DRE produces a tabulation of the voting data stored in a removable memory component and in printed hardcopy.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
EMS Election Event Designer	EED	EMS application used for election definition functionality.
Election Management System	EMS	An umbrella term for the software application used to define and report election projects.
Equipment Under Test	EUT	---

**3.0 TEST BACKGROUND (Continued)**

**3.5 Terms and Abbreviations (Continued)**

**Table 3-1 Terms and Abbreviations (Continued)**

<b>Term</b>	<b>Abbreviation</b>	<b>Definition</b>
Functional Configuration Audit	FCA	Exhaustive verification of every system function and combination of functions cited in the manufacturer's documentation.
Federal Communications Commission	FCC	---
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
ImageCast Precinct	ICP	Precinct-level optical scanner and tabulator with audio voting capabilities.
ImageCast Evolution	ICE	Precinct-level optical scanner, tabulator with audio voting and integrated Ballot-marking Device
ImageCast Central	ICC	COTS High-speed central ballot scan tabulator.
Physical Configuration Audit	PCA	Review by accredited test laboratory to compare voting system components submitted for certification testing to the manufacturer's technical documentation, and confirmation the documentation meets national certification requirements.
Quality Assurance	QA	---
EMS Results, Tally and Reporting	RTR	EMS application used to integrate election results and reporting.
System Under Test	SUT	---
Test Case Procedure Specifications	TCPS	Wyle-developed document that specifies test items, input specifications, output specifications, environmental needs, special procedural requirements, inter-case dependencies, and all validated test cases that were executed during the area under test.
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Underwriters Laboratories Inc.	UL	---
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Operating Procedure	WoP	Wyle Laboratories' Test Method or Test Procedure.

## **4.0 TEST PROCEDURES AND RESULTS**

The Dominion Voting Systems Democracy Suite 4.14-B Voting System, as identified in Section 2.0 of this report, was subjected to the tests as summarized in this section.

### **4.1 System Level Testing**

System Level Testing was performed to evaluate the operation of the modifications submitted for the Democracy Suite 4.14-B Voting System. The suite of tests that comprised the System level Testing included a Physical Configuration Audit and Functional testing.

An overview of the tests performed during System Level Testing is provided in the following paragraphs, along with the summary findings of each test.

#### **4.1.1 Physical Configuration Audit**

A Physical Configuration Audit (PCA) of the Democracy Suite 4.14-B Voting System was performed in accordance with Section 6.6 of Volume II of the VVSG. The PCA compares the voting system components submitted for certification with the vendor's technical documentation and confirms that the documentation submitted meets the requirements of the Guidelines. The PCA included the following activities:

- Establishing a configuration baseline of hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system
- Reviewing drawings, specifications, technical data, and test data associated with system hardware; and to establish a system baseline
- Reviewing manufacturer's documents of user acceptance test procedures and data against system's functional specifications, and resolve any deficiency or inadequacy in manufacturer's plan or data prior to beginning functional tests
- Subsequent changes to baseline hardware configuration made during testing that may produce a change in operation are subject to re-examination

The PCA performed on the Democracy Suite 4.14-B Voting System consisted of inspecting the following:

- The Democracy Suite 4.14-B ImageCast Evolution precinct ballot counter with applied ECOs
- The Democracy Suite 4.14-B ImageCast Evolution Plastic Ballot Box with applied ECOs

#### **Summary Findings**

A focused PCA was performed to baseline the system's hardware components that were used during the test campaign. No deficiencies were noted during the PCA.

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#### 4.0 TEST PROCEDURES AND RESULTS (Continued)

#### 4.1 System Level Testing (Continued)

#### 4.1.2 Functional Testing

Functional Tests were performed on the Democracy Suite 4.14-B Voting System in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the first functional test was to verify that ImageCast Precinct (ICP) and ImageCast Evolution (ICE) tabulators allow voters to make candidate selections in acclaimed contests when voting an audio ballot, verifying that the reports produced by both the Tabulator and EMS as well as the AuditMark feature correctly report undervotes in a contest where the Vote For value is larger than the number of selectable candidates, ensuring that the tabulators performed as documented in the Dominion-supplied technical documentation, and meet the requirements of the EAC 2005 VVSG. The second functional test was performed to verify that the ECO changes made to the ImageCast Evolution tabulator and the ImageCast Evolution Plastic Ballot Box did not affect the tabulator's ability to process ballots.

The components of the functional tests included the previously-certified Democracy Suite 4.14-A EMS, ImageCast Evolution tabulators, and ImageCast Precinct tabulators.

First, ImageCast Evolution Unit No. 1, loaded with firmware from the Dominion Democracy Suite 4.14-A trusted build, was used to mark and cast ballots in Audio Visual mode to verify that the voter was not able to select candidates when voting in Acclaimed Contests. Next, ImageCast Evolution Unit No. 2, loaded with the new version of the ICE firmware, was used to mark and cast ballots in Audio Visual mode to verify that the voter is prompted to make candidate selections when voting in Acclaimed Contest. The results from ImageCast Evolution Unit No. 2 were imported into the EMS. The results reports printed by the tabulator, results reports produced by the EMS, and the AuditMark attached to the ballot images were inspected to verify that undervotes were correctly reported. This process was then repeated using ImageCast Precinct Unit No. 1, loaded with firmware from the Dominion Democracy Suite 4.14-A trusted build and ImageCast Precinct Unit No. 2, loaded with the new version of the ICP firmware.

The second functional test was performed to ensure that the Engineering Change Order (ECO) changes made to the ImageCast Evolution precinct ballot counter and the ImageCast Evolution Plastic Ballot Box did not adversely affect the ICE units' ballot scanning and tabulation capabilities. The ImageCast Evolution Unit No. 2 with the new version of the ICE firmware was placed into "Shoeshine Mode" in which ballots are continuously cast by the tabulator. A total of 5,000 ballots were cast on the ICE unit then the results report was printed and the results were verified.

#### **Summary Findings**

Functional Tests were performed to ensure that the system functions and operates as described within the system's technical documentation and to ensure that Engineering Change Orders (ECOs) applied to the ImageCast Evolution precinct ballot counter and its associated Plastic Ballot Box did not affect the tabulator's ballot scanning and tabulation capabilities. Refer to Notice of Anomaly (NOA) No. 1 presented in Appendix C and Section 4.6 for further details. After resolution of the anomaly, the voting system successfully met the requirements of the functional tests. Through Functional Testing, it was demonstrated that the ICE and ICP precinct ballot counters successfully handled acclaimed contests and reporting of undervotes when voting audio ballots, and that ECOs applied to the ImageCast Evolution precinct ballot counter and the associated Plastic Ballot Box did not affect the tabulator's ballot scanning and tabulation capabilities. The photographs of the test setup are located in Appendix A of this test report.



#### **4.0 TEST PROCEDURES AND RESULTS (Continued)**

#### **4.2 Source Code Review**

The source code for the modifications made to the ImageCast Precinct (ICP) and ImageCast Evolution (ICE) precinct ballot tabulators for the Democracy Suite 4.14-B Voting System was reviewed for conformance with the requirements set forth in Section 5.4 of the EAC 2005 VVSG coding standards and the manufacturer-supplied coding standards (Dominion Coding Standards), which can be found within the vendor provided TDP. The review was conducted as part of the testing activities and was performed per the guidelines described in the following paragraphs. Wyle Laboratories used the source code from the EAC Certified Democracy Suite 4.14 and Democracy Suite 4.14-A Voting Systems as a baseline to compare against the modified source code for the ImageCast Precinct and ImageCast Evolution tabulators.

The manufacturer-supplied coding standards (Dominion Coding Standards) can be found within the manufacturer provided TDP. The review was conducted per the guidelines described in this section.

As the updated source code was received, an SHA1 hash value was created for each source code file. The source code team conducted a manual review of every line of modified source code. This was done to identify any violation of EAC 2005 VVSG coding standards or manufacturer supplied coding standards. The COTS tools utilized by the source code group were Beyond Compare and Crimson Editor. Each identified violation was then recorded by making notes of the standards violation along with directory name, file name, and line number.

#### **Summary Findings**

Other than the coding standards noted in the technical summary reports, no other deficiencies or significant problems were found during the source code review. A technical summary report of all identified standards violations was sent to Dominion for resolution. Dominion then corrected all standards violations and re-submitted the source code for re-review. This process was repeated as many times as necessary until all identified standards violations were corrected. Notice of Anomaly No. 2, documenting that source code discrepancies found, is included in Appendix C of this report.

#### **4.3 Witnessed Build**

A Witnessed/Trusted Build of the software was created using Dominion's trusted build documents. The Witnessed/Trusted Builds were performed by completing the following tasks in the order listed:

- Clear hard drive of existing data
- Retrieve the compliant source code
- Retrieve the installation media for OS, compilers, and build software
- Construct the build environment
- Create digital signatures of the pre-source build environment
- Create a disk image of the pre-source build environment
- Load the compliant source code into the build environment
- Create a digital signature of the post-source build environment
- Create a disk image of the post-source build environment
- Build the executable code
- Create the installation media
- Create a digital signature of the final build environment
- Create a disk image of the final build environment

#### 4.0 TEST PROCEDURES AND RESULTS (Continued)

##### 4.3 Witnessed Build (Continued)

- Create a digital signature of the installation media
- Install executable code onto the hardware and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media to the EAC Repository.

The Witnessed/Trusted Builds for the Dominion Democracy Suite 4.14-B include source code, data, and script files, in clear text form. The builds also include COTS software on commercially-available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by Dominion Voting Systems. The first step of the process was to clean the hard drives by writing data to every sector of the hard drive, so the drive is cleared of existing data. The designated operating system was then loaded and the applications from the VSTL-reviewed source along with the VSTL verified COTS software was built. The final step was installing the applications on the hardware.

##### Summary Findings

Wyle Laboratories performed Witnessed/Trusted Builds of the ImageCast Precinct (ICP) and ImageCast Evolution (ICE) precinct ballot counter firmware included in the Dominion Democracy Suite 4.14-B Voting System, on November 20, 2013 through December 4, 2013. A Technical Representative was present via a live video feed for each of the Witnessed/Trusted Builds. The outputs from the Witnessed/Trusted Builds have been supplied to the EAC as part of the certification effort.

##### 4.4 Technical Data Package Review

The Democracy Suite 4.14-B Voting System Technical Data Package (TDP) was reviewed to the 2005 VVSG. This review was performed as part of the pre-testing activities. The TDP documents were reviewed to ensure that all modifications to the system are described as applicable. The TDP documents were reviewed for accuracy, completeness, and compliance to the VVSG.

##### Summary Findings

No deficiencies or problems were found during the Technical Data Package (TDP) Review.

##### 4.5 Engineering Change Order (ECO) Analysis

Engineering Change Orders (ECOs) were submitted for both the ImageCast Evolution (ICE) Precinct Count Optical Scanner and the ImageCast Evolution Plastic Ballot Box. An engineering analysis of the submitted ECOs was performed and upon conclusion of the analysis, it was decided that no additional hardware testing was required. To ensure that the ECO changes did not affect the performance of the ICE precinct ballot counter and ICE Plastic ballot, a Functional Reliability test described in Section 4.1.2 of this document was performed. A listing of the submitted ECOs is included in Appendix A of Wyle Laboratories' Certification Test Plan As Run No. T71372.01-01, located in Appendix B of this test report.

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#### 4.0 TEST PROCEDURES AND RESULTS (Continued)

#### 4.6 Anomalies and Resolutions

A total of two Notices of Anomaly were issued throughout the test campaign upon occurrence of a verified failure, an unexpected test result, or any significant unsatisfactory condition. All anomalies encountered during testing were successfully resolved prior to test completion. The Notices of Anomaly generated are presented in their entirety in Appendix C of this test report and are summarized below along with their resolution.

Notice of Anomaly No. 1: Functional Testing:

Functional testing of acclaimed contest behavior on an ICE tabulator revealed that AuditMarks appended to ballot images by the ICE tabulator did not mention inherent undervotes resulting from an acclaimed contest in which the Vote For value was larger than the number of candidates available for selection.

Resolution to Anomaly No. 1:

Dominion Voting Systems made a source code change to the ICE firmware. Wyle Laboratories reviewed the source code and performed a Trusted Build of the updated firmware. A functional regression test was then performed to verify that the AuditMark appended to ballot images produced by ICE tabulators mentioned inherent undervotes in acclaimed contests.

Notice of Anomaly No. 2: Source Code:

Review of the submitted source code for the Democracy Suite Version 4.14-B Voting System revealed deviations from the standard. The deficiencies identified during source code review consist of the following: Three instances of header inputs or outputs being missing or inaccurate, four instances of header units called being missing or inaccurate, one instance of a unit size being greater than 240 lines, and one instance of inconsistent indenting. Upon completion of the review for each source code submission, a technical summary report of all identified standards violations was sent to Dominion Voting Systems for resolution.

Resolution to Anomaly No. 2:

Dominion Voting Systems corrected the reported violations and re-submitted the source code for re-review. This process was repeated as many times as necessary until all identified standards violations were corrected.

#### 4.7 Recommendation for Certification

Wyle Laboratories performed conformance/specification testing on the Dominion Voting Systems Democracy Suite 4.14-B to the EAC 2005 VVSG (Version 1.0). During the test campaign, all data from pre-testing and functional testing activities was combined to ensure all VVSG requirements that are supported by the Democracy Suite 4.14-B had been tested. Wyle Laboratories also used discretion as granted by the VVSG to design and exercise Functional Test Cases.

Wyle Laboratories concludes that the Democracy Suite 4.14-B, submitted by Dominion Voting Systems, meets all applicable requirements for certification as set forth in the Election Assistance Commission (EAC) 2005 Voluntary Voting Systems Guidelines, Version 1.0. As such, Wyle Laboratories recommends that the EAC grant the Dominion Voting Systems Democracy Suite 4.14-B certification to the VVSG.

**4.0 TEST PROCEDURES AND RESULTS (Continued)**

**4.7 Recommendation for Certification (Continued)**

This test report is valid only for the system identified in Section 2.0 of this test report. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to the EAC to determine if the modified system requires a new application, or can be submitted as a modified system. The scope of testing required will be determined based upon the degree of modification.

**Due to the varying requirements of individual jurisdictions, it is recommended by the VVSG that local jurisdictions perform pre-election logic and accuracy tests on all systems prior to their use in an election within their jurisdiction.**

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**APPENDIX A**  
**PHOTOGRAPHS**



**Photograph 1**  
**Functional Tests: ImageCast Evolution #1 S/N ICE2P200004**



**Photograph 2**  
**Functional Tests: ImageCast Evolution #2 S/N AAFEBDW0117 mounted on ICE Plastic Ballot Box S/N AAUCBDQ0074**





**Photograph 3**  
**Functional Tests: ImageCast Precinct #1 S/N WLDAFBH0023**





**Photograph 4**  
**Functional Tests: ImageCast Precinct #2 S/N AANAGCP0265**

**APPENDIX B**

**WYLE'S CERTIFICATION TEST PLAN AS RUN NO. T71372.01-01**



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Job No. T71372.01  
Test Plan No. T71372.01-01 Rev B  
December 12, 2013

## CERTIFICATION TEST PLAN


Prepared for:

<b>Manufacturer Name</b>	Dominion Voting Systems, Inc.
<b>Manufacturer System</b>	Democracy Suite Version 4.14-B
<b>EAC Application No.</b>	DVS1302
<b>Manufacturer Address</b>	1201 18 <sup>th</sup> Street, Suite 210 Denver, Colorado 80202



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			REPORT NO.    Test Plan T71372.01-01 Rev B
			DATE            December 12, 2013
REV	DATE	PAGE OR PARAGRAPH AFFECTED	DESCRIPTION OF CHANGES
---	11-26-13	Entire Document	Original Release
A	12-10-13	Section 1.1	Updated wording to sentence describing the "Acclaimed Contest Behavior" change for clarity, and added a sentence defining "acclaimed contest."
A	12-10-13	Section 1.5.1	Added abbreviation to Election Management System component name.
A	12-10-13	Section 1.5.1	Updated wording in description of ImageCast Central Workstation for clarity.
A	12-10-13	Section 3.1	Updated wording to sentence describing software change for clarity, and added a sentence defining "acclaimed contest."
A	12-10-13	Section 4.4	Replaced "visual scan of every line of source code for an initial review and" with "manual review of" in sentence describing source code review process.
A	12-10-13	Section 6.3.1	Updated section to address Regression Testing.
B	12-12-13	Entire Document	Updated to "As Run" Test Plan for Final Report

WYLE LABORATORIES, INC.  
 Huntsville Facilities

TABLE OF CONTENTS

**1.0 INTRODUCTION..... 1**

1.1 Scope..... 1

1.2 References..... 1

1.3 Terms and Abbreviations..... 2

1.4 Testing Responsibilities ..... 4

1.4.1 Test Case Development ..... 4

1.4.2 Test Procedure Development and Validation ..... 4

1.4.3 Third-Party Testing..... 4

1.5 Target of Evaluation Description..... 4

1.5.1 System Overview ..... 4

**2.0 PRE-CERTIFICATION TESTING AND ISSUES ..... 9**

2.1 Evaluation of Prior VSTL Testing..... 9

2.1.1 Known Field Issues..... 9

**3.0 MATERIALS REQUIRED FOR TESTING..... 9**

3.1 Software..... 9

3.2 Equipment..... 9

3.3 Test Tools/Material..... 10

3.4 Deliverable Materials..... 10

**4.0 TEST SPECIFICATIONS ..... 11**

4.1 Requirements (Strategy of Evaluation)..... 11

4.2 Hardware Configuration and Design ..... 12

4.3 Software System Functions..... 12

4.4 Source Code Review ..... 12

**5.0 TEST DATA..... 13**

5.1 Test Data Recording ..... 13

5.2 Test Data Reduction..... 14

**6.0 TEST PROCEDURE AND CONDITIONS..... 15**

6.1 Facility Requirements ..... 15

6.2 Test Set-Up ..... 15

6.3 Test Sequence ..... 16

6.3.1 System Testing..... 16

6.4 Test Operation Procedures ..... 17

**7.0 TEST OPERATIONS PROCEDURES ..... 17**

7.1 Proprietary Data ..... 17

APPENDICES

APPENDIX A - ENGINEERING CHANGE ORDERS (ECOs)..... A-1



## 1.0 INTRODUCTION

The purpose of this Test Plan is to document the procedures that Wyle Laboratories, Inc. will follow to perform certification testing of the Dominion Voting Systems Democracy Suite 4.14-B to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (EAC 2005 VVSG). Prior to submitting the System for certification testing, Dominion submitted an application to the EAC for certification of the Democracy Suite 4.14-B to the requirements of the EAC 2005 VVSG.

The full system details for the previous test campaigns including system, performance, security, usability, system verification, and TDP deliverables can be reviewed in the EAC test reports "Dominion Democracy Suite 4.0," "Dominion Democracy Suite 4.14 Modification," and "Dominion Democracy Suite 4.14-A Modification" (listed on [www.eac.gov](http://www.eac.gov)).

### 1.1 Scope

The purpose of this modification is to introduce the upgrade from the EAC certified Democracy Suite 4.14-A (DemSuite-4-14-A) Voting System to the Democracy Suite 4.14-B (DemSuite-4-14-B) Voting System.

\*Note: The Democracy Suite 4.14-A (DemSuite-4-14-A) Voting System is an upgrade to the Democracy Suite 4.14 (DemSuite-4-14) Voting System, which is itself an upgrade to the Democracy Suite 4.0 (DVS-40-G-10) Voting System.

The software utilized in the system will also be compared to versions that have been submitted for testing in previous EAC campaigns at Wyle Laboratories to determine the extent of the source code review required (annotated later in the test plan). All modified source code will be reviewed 100% by Wyle. Wyle Laboratories' personnel will perform functional testing to ensure that all applicable VVSG requirements are met and changes to the software do not adversely affect operational features of the voting system.

The upgraded features included in this modification are listed below:

1. **Acclaimed Contest Behavior:** ImageCast Evolution and ImageCast Precinct application software has been updated to change the system's behavior when handling "acclaimed contests," during voting of an audio ballot. An Acclaimed Contest is a contest where the number of candidates is equal to or less than the "Vote For" number.
2. **Engineering Change Orders (ECOs):** ECOs that have been integrated into the latest production build of the ImageCast Evolution (ICE) precinct ballot tabulator and the ImageCast Evolution ballot box. A listing of the ECOs included in this test campaign is provided in Appendix A of this document.

At test conclusion, the results of all testing performed as part of this test program will be submitted to the EAC in the form of a final report.

### 1.2 References

The documents listed below were used in the development of the Test Plan and are utilized to perform certification testing.

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- Election Assistance Commission Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007

**1.0 INTRODUCTION (Continued)**

**1.2 References (Continued)**

- Election Assistance Commission Voting System Test laboratory Program Manual, Version 1.0, effective date July 2008
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107<sup>th</sup> Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories' Quality Assurance Program Manual, Current Revision
- Wyle Laboratories Quality Assurance Manual, Current Revision
- ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (listed on [www.eac.gov](http://www.eac.gov))
- EAC Notices of Clarification (listed on [www.eac.gov](http://www.eac.gov))
- EAC Quality Monitoring Program residing on:  
[http://www.eac.gov/testing\\_and\\_certification/quality\\_monitoring\\_program.aspx](http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx)
- Dominion Voting Systems' Democracy Suite 4.14 Modification VSTL Certification Test Report Rev. A (listed on [www.eac.gov](http://www.eac.gov))
- Dominion Voting Systems Democracy Suite 4.14 Technical Data Package
- Dominion Voting Systems' Democracy Suite 4.14-A Modification VSTL Certification Test Report Rev. B (listed on [www.eac.gov](http://www.eac.gov))
- Dominion Voting Systems Democracy Suite 4.14-A Technical Data Package

**1.3 Terms and Abbreviations**

Table 1-1 defines all terms and abbreviations applicable to the development of this Test Plan.

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**1.0 INTRODUCTION (Continued)**

**1.3 Terms and Abbreviations (Continued)**

**Table 1-1 Terms and Abbreviations**

<b>Term</b>	<b>Abbreviation</b>	<b>Definition</b>
Americans with Disabilities Act of 1990 (Amended 2008)	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Audio Studio	AS	EMS application used to record audio files.
Audio Tactile Interface	ATI	Electronic voter interface that does not require visual reading of a ballot. Audio is used to convey information to the voter and sensitive tactile controls allow the voter to convey information to the system.
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware or software.
Direct Record Electronic	DRE	An electronic voting system that utilizes electronic components for the functions of ballot presentation, vote capture, vote recording, and tabulation which are logically and physically integrated into a single unit. A DRE produces a tabulation of the voting data stored in a removable memory component and in printed hardcopy.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
EMS Election Event Designer	EED	EMS application used for election definition functionality.
Election Management System	EMS	An umbrella term for the software application used to define and report election projects
Equipment Under Test	EUT	---
Functional Configuration Audit	FCA	Exhaustive verification of every system function and combination of functions cited in the manufacturer's documentation.
Federal Communications Commission	FCC	---
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
ImageCast Central	ICC	High-speed central ballot scan tabulator.
ImageCast Evolution	ICE	Precinct-level optical scanner, ballot marker, and tabulator with audio voting.
ImageCast Precinct	ICP	Precinct-level optical scanner and tabulator with audio voting capabilities.
System Under Test	SUT	---
Test Case Procedure Specifications	TCPS	Wyle Laboratories-developed document that specifies test items, input specifications, output specifications, environmental needs, special procedural requirements, inter-case dependencies, and all validated test cases that will be executed during the area under test.
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Underwriters Laboratories Inc.	UL	---
Uninterruptible Power Supply	UPS	---
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Laboratories Operating Procedure	WoP	Wyle Laboratories' Test Method or Test Procedure.

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**1.0 INTRODUCTION (Continued)**

**1.4 Testing Responsibilities**

All core and non-core software and hardware certification testing will be conducted under the guidance of Wyle Laboratories, Inc. by personnel verified by Wyle Laboratories to be qualified to perform the testing.

**1.4.1 Test Case Development**

Wyle Laboratories will utilize the "Wyle Baseline Test Cases" for the Functional Test. These will be augmented with specially-designed test cases tailored to the Dominion Democracy Suite 4.14-B.

**1.4.2 Test Procedure Development and Validation**

Wyle Laboratories will utilize the Wyle Operating Procedures (WoPs) during the duration of this test program. The validated WoPs have been previously submitted to the EAC for review.

**1.4.3 Third-Party Testing**

Wyle Laboratories will not utilize any 3rd party testing during the performance of the Dominion 4.14-B test campaign.

**1.5 Target of Evaluation Description**

The following sections address the design methodology and product description of the Democracy Suite 4.14-B Voting System, as taken from the Dominion Voting Systems technical documentation.

**1.5.1 System Overview**

The Dominion Voting Systems Democracy Suite 4.14-B System is a paper-based optical scan voting system, and a modification of the previously-certified Democracy Suite 4.14-A System.

The certified system consists of four major components: the Election Management System (EMS), ImageCast Evolution (ICE) precinct scanner and ballot marking device, ImageCast Precinct (ICP) precinct scanner with audio ballot, and ImageCast Central (ICC) central count scanner.

**Election Management System**

The EMS consists of eight components running as either a front-end/client application or as a back-end/server application. Below is an overview and brief description of each. This listing is for informational and verification purposes only and not all areas will be included in testing based on the limited modifications included in this test campaign.

- Election Event Designer (EED) client application - integrates election definition functionality and represents a main pre-voting phase end-user application.
- Results Tally and Reporting client application - integrates election results acquisition, validation, tabulation, reporting and publishing capabilities and represents a main post-voting phase end-user application.

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview (Continued)

Election Management System (Continued)

- Audio Studio client application - represents an end-user helper application used to record audio files for a given election project. As such, it is utilized during the pre-voting phase of the election cycle.
- Data Center Manager client application - represents a system level configuration application used in EMS back-end data center configuration.
- Application Server application - represents a server side application responsible for executing long running processes, such as rendering ballots, generating audio files and election files, etc.
- Network Attached Storage (NAS) Server application - represents a server side file repository for election project file based artifacts, such as ballots, audio files, reports, log files, election files, etc.
- Database Server application - represents a server side RDBMS repository of the election project database which holds all the election project data, including pre-voting and post-voting data.
- Election Data Translator (EDT) exports and imports data in a format suitable for usage in the Election Event Designer (EED) application.

Precinct Ballot Tabulator: ImageCast Evolution (ICE)

The Dominion Democracy Suite ImageCast Evolution System employs a precinct-level optical scan ballot counter (tabulator) in conjunction with ImageCast compatible ballot storage boxes. This tabulator is designed to mark and/or scan paper ballots, interpret voting marks, communicate these interpretations back to the voter (either visually through the integrated LCD display or audibly via integrated headphones), and upon the voter's acceptance, deposit the ballots into the ballot box. The unit also features an Audio Tactile Interface (ATI) which permits voters who cannot negotiate a paper ballot to generate a synchronously human and machine-readable ballot from elector-input vote selections. In this sense, the ImageCast Evolution acts as a ballot marking device.

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- 1.0 INTRODUCTION (Continued)
- 1.5 Target of Evaluation Description (Continued)
- 1.5.1 System Overview (Continued)

Precinct Ballot Tabulator: ImageCast Evolution (ICE) (Continued)



Photograph 1: ImageCast Evolution (ICE) on Plastic Ballot Box

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- 1.0 INTRODUCTION (Continued)
- 1.5 Target of Evaluation Description (Continued)
- 1.5.1 System Overview (Continued)

**Precinct Ballot Tabulator: ImageCast Precinct (ICP)**

The Dominion Democracy Suite ImageCast Precinct ballot counter is a precinct-based optical scan ballot tabulator that is used in conjunction with ImageCast compatible ballot storage boxes. The system is designed to scan marked paper ballots, interpret voter marks on the paper ballot and store and tabulate each vote from each paper ballot. The ICP contains a small touch-screen LCD to allow the poll worker to access diagnostic and configuration settings.

In addition, enhanced accessibility voting may be accomplished via optional accessories connected to the ImageCast unit. The ICP utilizes an ATI device to allow voters with disabilities to navigate and submit a voted ballot. This is accomplished by presenting the ballot to the voter in an audio format. The ATI is connected to the tabulator, and allows the voter to listen to an audio voting session consisting of contest and candidate names. The ATI also allows a voter to adjust the volume and speed of audio playback. The cast vote record is recorded electronically when the ATI is used to cast a ballot. There is no contemporaneous paper ballot or paper record produced when the ATI is utilized for voting. A ballot arising from the voter's choices may be printed from EMS at a later time.



Photograph 2: ImageCast Precinct (ICP) on Metal Ballot Box



1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview (Continued)

**Central Tabulator: ImageCast Central Count (ICC)**

The Dominion Democracy Suite ImageCast Central Count ballot counter system is a high-speed, central ballot scan tabulator based on COTS hardware, coupled with the custom-made ballot processing application software. It is used for high speed scanning and counting of paper ballots. Central Count scanning system hardware consists of a combination of two COTS devices used together to provide the required ballot scanning processing functionality:

- ImageCast Central Workstation: a COTS computer which hosts the ImageCast Central application used for ballot image processing, election rules processing, and results transfer to the EMS Datacenter.
- Canon DR-X10C Scanner: a COTS scanner used to provide ballot scanning and image transfers to the local ImageCast Central Workstation.



**Photograph 3: Canon DR-X10C Scanner and ImageCast Central Workstation**

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## 2.0 PRE-CERTIFICATION TESTING AND ISSUES

Wyle Laboratories has conducted a pre-certification test, and findings indicate that all system changes are consistent with the change items documented in the EAC application DVS-1302.

### 2.1 Evaluation of Prior VSTL Testing

Wyle Laboratories will reuse all testing from the previously-certified systems submitted by Dominion Voting Systems. The testing of these systems was conducted by Wyle Laboratories in accordance with the EAC 2005 VVSG, and the EAC Certification Numbers are DVS-40-G-10, DemSuite-4-14, and DemSuite-4-14-A.

#### 2.1.1 Known Field Issues

This system is a modification to previously-certified systems. There were no systemic or significant issues traceable to any of the previously certified systems.

## 3.0 MATERIALS REQUIRED FOR TESTING

The materials required for certification testing of the Democracy Suite 4.14-B Voting System include software, hardware, test materials, and deliverable materials, to enable the test campaign to occur, were shipped directly to Wyle Laboratories by Dominion Voting Systems. The equipment used during this test is the same equipment used during the original certification campaign.

### 3.1 Software

The Democracy Suite Version 4.14 software for the Election Event Designer, Results Tally and Reporting, and ImageCast Central will be utilized during the Democracy Suite 4.14-B modification as there were no changes to these software items for this modification. The software for the ImageCast Precinct and ImageCast Evolution precinct ballot tabulators will be updated to change the system's "acclaimed contest" behavior when voting an audio ballot. An acclaimed contest is a contest where the number of candidates is equal to or less than the "Vote For" number. This software is listed in Table 3-1.

Table 3-1 Software Utilized for Testing

Software Required For Testing	Software Version
Democracy Suite EMS EED Client Application	4.14.23
Democracy Suite EMS RTR Client Application	4.14.23
ImageCast Precinct (ICP)	4.14.9
ImageCast Evolution (ICE)	4.14.13

### 3.2 Equipment

This subsection categorizes the equipment the manufacturer submitted for testing listed in Table 3-2. Each test element is included in the list of equipment required for testing of that element, including system hardware, general purpose data processing and communications equipment, and any required test instrumentation.

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-2 Test Equipment

Equipment	Manufacturer	Serial Number
Laptop - Latitude E6530	Dell	2779CW1
ICP - Precinct Count Optical Scanner	Dominion Voting Systems	AANAGCP0265
ICP - Precinct Count Optical Scanner	Dominion Voting Systems	WLDAFBH0023
ICE - Precinct Count Optical Scanner	Dominion Voting Systems	AAFEBDW0117
ICE - Precinct Count Optical Scanner	Dominion Voting Systems	ICE2P200004
ICE Ballot Box	Dominion Voting Systems	AAUCBDQ0074
iButton (SHA-1) with USB Reader/Writer	Maxim	514DEFD
Compact Flash cards	RiData CFC-14A	N/A
Compact Flash Card Reader	SanDisk	0171630

3.3 Test Tools/Material

This subsection enumerates any and all test materials needed to perform voter system testing in Table 3-3. The scope of testing determines the quantity of a specific material required.

Table 3-3 Test Tools/Material

Test Tool/Material	Quantity
80 lb. Stock Ballot Paper	as required
Sharpie Markers	as required
Printer Thermal Paper Rolls	as required
Ballot Box Security Seals/Hasp Locks	as required

3.4 Deliverable Materials

At test conclusion, Wyle Laboratories shall deliver a final report to Dominion Voting Systems and the EAC that includes the following:

- A description of the functional testing results
- ECO analysis results
- TDP documentation showing changes
- A list of any anomalies discovered during testing on Wyle Laboratories form WH1066, Notice of Anomaly

All supplied equipment and software furnished to Wyle Laboratories for this modification shall be returned to the customer at the conclusion of testing unless otherwise agreed in writing.

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#### 4.0 TEST SPECIFICATIONS

Modification testing of the DVS 4.14-B is the configuration submitted in the EAC application DVS1302. Wyle Laboratories' qualified personnel will ensure that all certification testing performed on the manufacturer's voting system follows Wyle Laboratories' procedures for testing, and the specific test cases developed for this campaign meet the requirements of the EAC 2005 VVSG and EAC Testing and Certification Program Manual.

All RFIs and NOCs applicable as of the date of this document shall apply to this test campaign unless otherwise noted.

#### 4.1 Requirements (Strategy of Evaluation)

The strategy for evaluating the Democracy Suite 4.14-B System was to review the change log and the engineering changes submitted for the modified system. Wyle Laboratories has determined that functional tests will be required during this test campaign.

This test campaign includes the following tests:

- Technical Data Package review to ensure all modifications are documented as applicable.
- Source Code Review to ensure all modified software meets 2005 VVSG requirements.
- Functional tests targeted to validate proper behavior for "acclaimed contests" for the ICP and ICR precinct ballot tabulators
- Engineering Change Order (ECO) Review and Engineering Analysis of the ECOs applied to the ImageCast Evolution precinct ballot counter and the Image Cast Evolution ballot box

Wyle Laboratories' personnel shall maintain a test log of the procedure(s) employed. This log identifies the system and equipment by model and serial number.

In the event that the project engineer deems it necessary to deviate from Wyle Test Cases or Wyle Operating Procedures (WoPs) pertaining to the test environment, the equipment arrangement and the method of operation, the specified test procedure, or the provision of the test instrumentation and facilities, the deviation shall be recorded in the test log. (A discussion of the reasons for the deviation and the effect of the deviation on the validity of the test procedure shall also be provided and approved by the Project Engineer and Program Manager).

The designated WoPs for this program are listed below together with the identification and a brief description of the hardware to be tested, and any special considerations that affect the test design and procedure.

The specific WoPs to be used during testing include the following:

- WoP 1 – Operational Status Checks
- WoP 2 – Receipt Inspection
- WoP 3 – Technical Data Package Review
- WoP 4 – Test Plan Preparation
- WoP 5 – Source Code Review
- WoP 7 – Trusted Build
- WoP 25 – Physical Configuration Audit
- WoP 26 – Functional Requirements
- WoP 34 – Test Report



**4.0 TEST SPECIFICATIONS (Continued)**

**4.2 Hardware Configuration and Design**

Dominion Voting Systems submitted Engineering Change Orders (ECO's) for each of the changes submitted for the Democracy Suite 4.14-B test campaign. Wyle Laboratories will perform an engineering analysis of these documents, as well as a visual inspection of the changes, to determine if further testing is required for this test campaign due to the nature of the modifications.

The Democracy Suite 4.14-B EMS shall be configured as follows for functional testing:

EMS – A COTS laptop documented in Section 3.2 shall be loaded with version 4.14.23 build of the EMS. The CF Card Reader shall be attached as a peripheral.

ICP, ICE – Loaded with firmware built from source code reviewed by Wyle Laboratories, and mounted on an ImageCast compatible ballot box.

**4.3 Software System Functions**

The submitted changes for this test campaign are documented in Section 1.1. 100% of all modified software will be manually reviewed to the 2005 VVSG requirements. The modifications shall be tested using targeted functional tests designed to verify specific changes made to the voting system. Operational status checks will be performed before and after each test to confirm system readiness.

**4.4 Source Code Review**

The strategy for evaluating Dominion Democracy Suite 4.14-B will be based on the previously identified modification to the system. All changes from Democracy Suite 4.0 (DVS-40-G-10) will be reviewed to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards (Dominion Voting C/C++ Coding Standard).

As the source code is received, an SHA1 hash value will be created for each source code file. The source code team will conduct a manual review of every line of modified source code. This is done to identify any violation of EAC 2005 VVSG coding standards or manufacturer supplied coding standards. Each identified violation will be recorded by making notes of the standards violation along with directory name, file name, and line number.

All identified violations will be recorded by making notes of the standards violation along with the directory name, file name, and line number. A technical report of all identified violations will be sent to Dominion for resolution on a regular basis. All revised source code will be checked for corrections until the final issue is resolved. At the end of the Source Code review process, an Anomaly Report will be issued listing all non-compliance on an individual basis to the EAC and Dominion. The results will be included in the final test report.

The next step in the source code review will be to create a "Trusted Build" from the approved source code.

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#### 4.0 TEST SPECIFICATIONS (Continued)

#### 4.4 Source Code Review (Continued)

##### Trusted Build Process

- Clean the build machine of existing software
- Retrieve the compliant source code
- Construct the build environment
- Create digital signatures of the build environment
- Load the compliant source code into the build environment
- Create a digital signature of the pre build environment
- Create a disk image of the pre-build environment
- Build executable code
- Create a digital signature of executable code
- Create a disk image of the post-build environment
- Build installation media
- Create a digital signature of the installation media
- Install executable code onto the system and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media with signatures to the EAC Approved Repository.

The "Trusted Build" for the Dominion Democracy Suite 4.14-B includes source code, data, and script files, in clear text form. The build also includes COTS software on commercially available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by Dominion Voting Systems. The first step of the process is to clean the hard drives by writing data to every spot on the hard drive, so the drive is cleared of existing data. The appropriate operating system will then be loaded and the applications from the VSTL reviewed source along with the VSTL verified COTS software will be built. The final step is installing the applications on the hardware.

#### 5.0 TEST DATA

#### 5.1 Test Data Recording

All equipment utilized for test data recording shall be identified in the test data package. Additionally, the output test data shall be recorded in an appropriate manner as to allow for data analysis. For TDP reviews, results shall be compiled in output reports and submitted to Dominion Voting Systems for resolution. All test results, including functional test data, shall be recorded on the relevant WoPs and Test Cases.

Wyle Laboratories shall evaluate all test results against the technical documentation provided by Dominion Voting Systems, as well as the requirements set forth in the 2005 VVSG. The acceptable range for system performance and the expected results for each test case shall be derived from the Dominion Voting Systems Version 4.14-B documentation.

**5.0 TEST DATA (Continued)**

**5.1 Test Data Recording (Continued)**

Per the EAC 2005 VVSG, these parameters shall encompass the test tolerances and samples to define the minimum number of combinations or alternatives of input and output conditions that can be exercised to constitute an acceptable test of the parameters involved. The parameters will also include events which criteria define the maximum number of interrupts, halts, or other system breaks that may occur due to non-test conditions (excluding events from which recovery occurs automatically or where a relevant status message is displayed).

Wyle Laboratories will report all issues discovered during this test campaign to Dominion and the EAC. If Wyle Laboratories determine there is not enough data to ensure a requirement was met, the test plan will be altered and further testing will be done. The EAC has the final decision as to whether the system meets all the requirements for an EAC-certified system. Wyle Laboratories will either recommend approval, if the system meets all applicable sections of the VVSG or recommend disapproval if the system does not meet all applicable sections of the VVSG.

**5.2 Test Data Reduction**

Test data shall be processed and recorded in the relevant Wyle Laboratories' Operating Procedures and Test Cases. Results will also be recorded real-time in engineering log books.

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## 6.0 TEST PROCEDURE AND CONDITIONS

### 6.1 Facility Requirements

All testing shall be conducted at the Wyle Laboratories Huntsville, AL facility unless otherwise annotated. All instrumentation, measuring, and test equipment used in the performance of this test campaign shall be listed on the Instrumentation Equipment Sheet for each test and shall be calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL Z540-1 and ISO 10012-1. Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards or the basis for calibration is otherwise documented.

Unless otherwise specified herein, all remaining tests, including system level functional testing, shall be performed at standard ambient conditions:

- Temperature:  $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$  ( $77^{\circ}\text{F} \pm 18^{\circ}\text{F}$ )
- Relative Humidity: 20 to 90%
- Atmospheric Pressure: Local Site Pressure

Unless otherwise specified herein, the following tolerances shall be used:

- Time  $\pm 5\%$
- Temperature  $\pm 3.6^{\circ}\text{F}$  ( $2^{\circ}\text{C}$ )
- Vibration Amplitude  $\pm 10\%$
- Vibration Frequency  $\pm 2\%$
- Random Vibration Acceleration
  - 20 to 500 Hertz  $\pm 1.5$  dB
  - 500 to 2000 Hertz  $\pm 3.0$  dB
- Random Overall grms  $\pm 1.5$  dB
- Acoustic Overall Sound Pressure Level  $\pm 4/-2$  dB

Deviations to the above tolerances may be submitted by the responsible test laboratory with sufficient engineering information to substantiate the deviation request, but only when best effort technique and system limitations indicate the need for a deviation.

### 6.2 Test Set-Up

All voting machine equipment (hardware and software) shall be received and documented, utilizing Wyle Laboratories' Receiving Ticket (WL-218, Nov'85) and proper QA procedures. When voting system hardware is received, Wyle Laboratories' Shipping and Receiving personnel will notify Wyle Laboratories' QA personnel. With Wyle Laboratories' QA personnel present, each test article shall be unpacked and inspected for obvious signs of degradation and/or damage that may have occurred during transit. Noticeable degradation and/or damage, if present, shall be recorded, photographs shall be taken, and the Dominion Voting Systems' representative shall be notified.

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6.0 TEST PROCEDURE AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Wyle Laboratories' QA personnel shall record the serial numbers and part numbers. Comparison shall be made between those numbers recorded and those listed on the shipper's manifest. Any discrepancies noted shall be brought to the attention of the Dominion Voting Systems' representative for resolution. The Technical Data Package and all source code modules received shall be inventoried and maintained by Wyle Laboratories' Project Engineer assigned to testing.

Wyle Laboratories' QA personnel shall record the serial numbers and part numbers. Comparison shall be made between those numbers recorded and those listed on the shipper's manifest. Any discrepancies noted shall be brought to the attention of the Dominion Voting Systems' representative for resolution.

For hardware test setup, the system shall be configured as it would be for normal field use. This includes connecting all supporting equipment and peripherals. Wyle Laboratories' personnel shall properly configure and initialize the system and verify it is ready to be tested by following the procedures detailed in the Dominion Voting System's technical documentation. Wyle Laboratories shall develop an operational status test to be performed prior to and immediately following each hardware test. Wyle Laboratories shall develop the system performance levels to be measured during operational tests.

6.3 Test Sequence

There is no specific sequencing enforced for the execution of the required tests. The following section provides a brief description of each system test to be performed for the Democracy Suite 4.14-B test campaign.

6.3.1 System Testing

Technical Data Package (TDP) Review – The technical data package must be submitted as a precondition of national certification testing. These items are necessary to define the product and its method of operation; to provide technical and test data supporting the manufacturer's claims of the system's functional capabilities and performance levels; and to document instructions and procedures governing system operation and field maintenance. Any information relevant to the system evaluation shall be submitted to include source code, object code, and sample output report formats.

Physical Configuration Audit – The Physical Configuration Audit compares the voting system components submitted for qualification to the manufacturer's technical documentation, and shall include the following activities:

- Establish a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system
- Verify software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification
- Review drawings, specifications, technical data, and test data associated with system hardware, if non-COTS, to establish system hardware baseline associated with software baseline
- Review manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests

6.0 TEST PROCEDURE AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.1 System Testing (Continued)

- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination.
- Functional Tests – Test cases will be developed which target specific functional changes made to the Democracy Suite 4.14-B Voting System. Functional tests will then be performed which verify that the functional changes function as described by the manufacturer. Test Cases developed for the functional tests will be provided to the EAC.
- Regression Testing – Wyle analyzed the submitted changes and determined that regression testing of the system is not required due to the changes being limited to the ImageCast Precinct and ImageCast Evolution precinct ballot tabulators' handling of "acclaimed contests" when voting audio ballots and does not affect other operations.

The components of the Dominion Voting Systems' Version 4.14-B shall only undergo the tests described in Table 6-1.

Table 6-1 Dominion Voting Systems version 4.14-B Test Sequence

Test	Procedure/Description	Specimen
Technical Data Package (TDP) Review	Documentation review for compliance, correctness, and completeness	TDP package submitted for Democracy Suite 4.14-B
Physical Configuration Audit	Audit hardware and software models and versions	System hardware and test artifacts submitted for Democracy Suite 4.14-B
Functional Tests	Functional testing to the system documentation and EAC 2005 VVSG requirements	System hardware and test artifacts submitted for Democracy Suite 4.14-B

6.4 Test Operation Procedures

Wyle Laboratories shall provide the step-by-step procedures for each test case to be conducted. Each step is assigned a test step number. This step number, along with critical test data and test procedural information, shall be tabulated onto a Test Control Record for control and the recording of test results.

Any test failures shall be recorded on form WH1066, Notice of Anomaly. These anomalies shall be reported to the manufacturer and the EAC.

7.0 TEST OPERATIONS PROCEDURES

7.1 Proprietary Data

All proprietary data that is marked shall be distributed only to those persons that the manufacturer identifies as needing the information to conduct system testing. The manufacturer is required to mark all proprietary documents as such. All organizations and individuals receiving proprietary documents shall ensure those documents are not available to non-authorized persons.

APPENDIX A  
ENGINEERING CHANGE ORDERS (ECOs)

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## ImageCast Evolution PCOS-410A Engineering Change Orders

### Change Type Legend

Abbrev.	Description
AVL	Approved Vendors List Change
DFM	Design for Manufacturing Change
DOC	Drawing or Production Documentation Change
PART	Part Change

Item #	Description	Rev	ECO#	Primary Change Type	Comment
109-001149	BASE PLATE ASSEMBLY	2	100077	DFM	Changed 4 slots to 4 holes to improve alignment on forming fixture
110-001009	Inductance 1.4uH L10.4x10.4MM 12A 20%	2	100079	DOC	Released to production; added second vendor
109-000616	BRACKET, REAR BELT TENSIONER	2	100084	DFM	Changed profile to allow more travel for new spring
109-001087	FRAME, TRANSPORT RIGHT	13	100084	DFM	Update spring tab for new rear spring; add burr side note
109-001149	BASE PLATE ASSEMBLY	3	100084	DFM	Changed 5 holes to slots to improve manufacturability
120-000044	Roller - Idler Nip	2	100084	DOC	Update Material
120-001060	Keymat, CAST & RETURN, PCOS-400A	2	100084	DFM	Changed actuation force and snap force as suggested by vendor. Corrected finish as per DFM feedback.
120-001064	Mount, Paperpath Left-side	4	100084	DFM	Changed 2 holes from 8mm DIA to 8.18mm DIA based on DFM feedback
120-001067	Baffle, Upper Print path	4	100084	DFM	Increased depth of cut on boss from 2mm to 4mm per DFM feedback
120-001068	Baffle, CIS mount	4	100084	DFM	Increased depth of cut on boss from 2mm to 4mm per DFM feedback
128-000017	HANDLE: PCOS 410A	3	100084	DFM	Added DRAFT per vendor's suggestion for texture
128-000036	COVER PRIVACY FLAP RIGHT	3	100084	DFM	Removed material on a bend and moved parting line per DFM feedback
128-000037	COVER PRIVACY FLAP LEFT	3	100084	DFM	Removed material on a bend and moved parting line per DFM feedback
128-000044	COVER FRONT	3	100084	DFM	Increased draft for texture
128-000048	HANDLE LEFT	3	100084	DFM	Changed height of side handle from 28.8mm to 24.8mm to improve manufacturability

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Item #	Description	Rev	ECO#	Primary Change Type	Comment
128-000049	DOOR, JAM CLEARANCE	3	100084	DFM	Change screw boss for new delta PT screws for pilot
109-001113	BRACKET, CIS MOUNT	6	100116	DFM	Increased slot length to improve manufacturability
109-001127	BAFFLE ASSY, DIVERTER REAR	5	100116	DFM	Increased width of roller cutout from 9.51mm to 10.11mm to improve manufacturability
109-001128	Baffle Assy, Upper Front	5	100116	DFM	Increased width of roller cutout from 9.51mm to 10.11mm to improve manufacturability
101-001010	Precision Resistor, thick film 12K R0402 1/16W 1% TF	2	100121	AVL	Added a second (equivalent) part number from the same vendor (Panasonic)
101-001097	High Precision Thin Film 0603 11.5 kOhm +0.25% Paper 330mm (13") 25 ppm/K	2	100121	AVL	Added a second (equivalent) part number from the same vendor (Yageo) plus added three vendors
101-001098	High Precision Thin Film 0603 147 kOhm +0.25% Paper 330mm (13") 25 ppm/K	2	100121	AVL	Added a second (equivalent) part number from the same vendor (Yageo) plus added three vendors
103-001005	Ceramic Chip Capacitor 0.12uF C0603 10V 10% X5R	2	100121	AVL	Kept original Panasonic part, added a vendor
103-001013	Ceramic Chip Capacitor 10pF C0402 50V 5% CGO	2	100121	AVL	Kept original Panasonic part, added three vendors
103-001014	Standard Multilayer Ceramic Capacitor- Class 2 10nF C0201 6.3V 10% X5R	2	100121	AVL	Added three additional capacitor vendors
103-001015	Standard Multilayer Ceramic Capacitor- Class 2 0.1uF C0201 6.3V 10% X5R	2	100121	AVL	Kept original Panasonic part, added four vendors
103-001017	Ceramic Chip Capacitor 2.2nF C0402 10V 10% X7R	2	100121	AVL	Kept original Kemet part, added another Kemet part number plus three vendors
103-001021	Ceramic Chip Capacitor 100pF C0402 50V 5% COG	2	100121	AVL	Kept original Panasonic part, added four vendors
103-001022	Ceramic Chip Capacitor 18pF C0402 50V 5% COG	2	100121	AVL	Added four additional capacitor vendors
103-001029	Ceramic Chip Capacitor 9pF C0402 50V 0.5% CGO	2	100121	AVL	Kept original Panasonic part, added two vendors
103-001034	Multilayer Ceramic Chip Capacitor 8.2nF C0402 16V 10% X7R	2	100121	AVL	Kept original Panasonic part, added four vendors
103-001037	Capacitor 0402 820pF 50V 5% X7R	2	100121	AVL	Kept original Panasonic part, added three vendors
103-001039	Capacitor 0603 100nF 50V 5% X7R	2	100121	AVL	Added four additional capacitor vendors

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**Page No. B-25 of 35**  
**Test Report No. T71372.01-01**

Page No. A-4 of 14  
 Certification Test Plan T71372.01-01 Rev B

Item #	Description	Rev	ECO#	Primary Change Type	Comment
103-001048	Capacitor 0603 10uF 6.3V 20% X5R	2	100121	AVL	Kept original Panasonic part, added five vendors
103-001053	CAP 0603 10uF 10V 20% X5R	2	100121	AVL	Kept original Panasonic part, added three vendors
103-001059	Capacitor, 27pF, Ceramic Chip ,0402, 50V, 5%, COG	2	100121	AVL	Kept original Panasonic part, added four vendors
109-000522	EMI SHIELD MONITOR ASM	4	100121	AVL	Vendor change
109-001087	FRAME, TRANSPORT RIGHT	15	100121	AVL	Vendor change
109-001088	FRAME, TRANSPORT LEFT	11	100121	AVL	Vendor change
109-001099	Baffle assy, lower rear	7	100121	AVL	Vendor change
109-001108	EMI shield, front transport	5	100121	AVL	Vendor change
109-001114	BRACKET, DSD	6	100121	AVL	Vendor change
109-001122	Baffle Assy, Lower Front	10	100121	AVL	Vendor change
109-001127	BAFFLE ASSY, DIVERTER REAR	4	100121	AVL	Vendor change
109-001128	Baffle Assy, Upper Front	4	100121	AVL	Vendor change
109-001129	Baffle Assy, Upper Rear	5	100121	AVL	Vendor change
109-001131	EMI SHIELD ,MCB RIGHT	6	100121	AVL	Vendor change
109-001132	EMI SHIELD, MCB LEFT	8	100121	AVL	Vendor change
109-001139	BRACKET, CF CARD READER	5	100121	AVL	Vendor change
109-001143	BRIDGE, MONITOR	8	100121	AVL	Vendor change
109-001148	BAFFLE ASSY, DIVERTER FRONT	5	100121	AVL	Vendor change
136-000015	MYLAR, FRONT LOWER	4	100121	AVL	Vendor change
136-000016	MYLAR, REAR UPPER	2	100121	AVL	Vendor change
136-001016	Mylar, CIS	4	100121	AVL	Vendor change
136-001022	MYLAR, PRINTER LOOP ENTRANCE	6	100121	AVL	Vendor change

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Item #	Description	Rev	ECO#	Primary Change Type	Comment
108-000006	PAPER SENSOR	1	100125	DOC	General Item change, no change to part
109-001087	FRAME, TRANSPORT RIGHT	B	100125	DFM	Moved wire saddle hole needed for cable management to improve manufacturability
109-001134	DOOR, MCB BOTTOM ACCESS	C	100125	DFM	Added witness line for locating Mylar placement
131-001004	HARNESS, CAB-210, MCB TO SERVICE ON/OFF POWER SWITCH	9	100125	DFM	Adding heat-shrink to protect harness from sharp edges
136-001020	Mylar, MCB access	B	100125	DOC	Profile and adhesive change
103-001026	Ceramic Chip Capacitor 0.01uF C0402 6.3V 10% X5R	2	100127	AVL	Removed original Kemet part number, replaced with two new vendors
123-001001	Memory module Mem Module DDR2 PC2-4200 1GB ECC 240pin	2	100129	AVL	Kingston part obsolete, moved to Micron
120-001064	Mount, Paperpath Left-side	16	100131	DFM	Removed tab and increased chamfer in slot
120-001065	Mount, Paperpath Right-side	17	100131	DFM	Removed tab and increased chamfer in slot
128-000039	SUPPORT ARM, MONITOR	4	100131	DFM	Increased overall width to match current parts; increased diameter of boss by 0.05mm
117-001009	BATTERY, PCOS-410A, LITHIUM ION, 14.8V, 8.8AH WITH LED DISPLAY AND PLASTIC CASE	3	100139	AVL	Procedure changes to battery's monitoring program (internal to battery)
135-001010	Shaft assy, main drive	7	100146	DFM	Changed mfg note to allow either overmolding or press fit of roller to shaft, was only overmolding allowed
135-001016	Shaft ASSY, drive nip1	6	100146	DFM	Changed note for roller from overmolded to press fit
135-001020	SHAFT ASSY, EXIT	9	100146	DFM	Changed mfg note to allow either overmolding or press fit of roller to shaft, was only overmolding allowed
109-000514	BRACKET MONITOR RIGHT ASM	5	100151	DFM	Change true position tolerance from 0.2 to 0.5, change tolerance of form dimension, change material thickness tolerance, corrected material note
109-000520	BRACKET MONITOR LEFT ASM	5	100151	DFM	Change true position tolerance from 0.2 to 0.5, change tolerance of form dimension, change material thickness tolerance
109-000521	BRACKET MONITOR PCB ASM	5	100151	DFM	Relaxed tolerance for material thickness per McAlpin request

**Page No. B-27 of 35**  
**Test Report No. T71372.01-01**

Page No. A-6 of 14  
 Certification Test Plan T71372.01-01 Rev B

Item #	Description	Rev	ECO#	Primary Change Type	Comment
109-001084	Bracket, Print path	8	100151	DFM	Changed true position tolerance from 0.1 to 0.38. changed note about burr size
109-001086	BRACKET, PRESSURE PLATE SPRING SUPPORT	9	100151	DFM	Added tooling hole as requested by manufacturer
109-001091	BRACKET, FLAG SENSOR	7	100151	DFM	Changed corner radii note, changed material thickness tolerance, removed deburr note
109-001098	EMI Shield: Transport ASM	10	100151	DFM	Added semi perfs to item 5 and locating holes to EMI shield as requested by vendor
109-001108	EMI shield, front transport	7	100151	DFM	Changed width of cutouts, changed burr note as requested by vendor
109-001118	TAB, BAFFLE MOUNTING	24	100151	DFM	As requested by McAlpin: changed true position tolerance from 0.10 to 0.38 changed note 6 to include corner radii of 0.5mm
109-001121	Bracket, motor mount	6	100151	DFM	Increased width of bend relief as requested by manufacturer
135-001011	DIVERTER FINGERS AND SHAFT (FRONT) BUY ASSY	5	100151	DFM	Changed tolerance on sheet 2 from 0/-0.08 to 0/-0.05
135-001012	SHAFT ASSY DIVERTER REAR	5	100151	DFM	Changed tolerance on sheet 2 from 0/-0.08 to 0/-0.05
180-001002	PCOS-410A UNIT LEVEL ASSEMBLY	33	100160	DFM	PN 180-001002 is the top level fully assembled unit, so any change to a lower level item will rev this part number; replaced obsolete Screw, M1.91 x 12mm T6 drive thread forming for plastic
109-001098	EMI Shield: Transport ASM	11	100162	DOC	Opened up tolerance
109-001136	BRACKET, THERMAL PRINTER	6	100162	DOC	Opened up tolerance
117-001009	BATTERY, PCOS-410A, LITHIUM ION, 14.8V, 8.8AH WITH LED DISPLAY AND PLASTIC CASE	4	100162	DFM	Opened up tolerance on plastic tabs on battery cover
120-000080	COVER MONITOR CABLE BOTTOM	4	100162	DFM	Opened up tolerance
120-000081	MOUNT INTRUSION SWITCH	4	100162	DFM	Opened up tolerance
120-000139	SPACER HINGE LEFT	4	100162	DFM	Opened up tolerance
120-000141	PRESSURE PLATE	3	100162	DOC	Opened up tolerance
120-001010	LEVER, GATE SHAFT	7	100162	DFM	Opened up tolerance
120-001026	LEVER, NIP RELEASE SHAFT	5	100162	DFM	Opened up tolerance

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Item #	Description	Rev	ECO#	Primary Change Type	Comment
120-001028	EXTENDER 2 - SOLENOID	6	100162	DOC	Opened up tolerance
120-001064	Mount, Paperpath Left-side	17	100162	DOC	Opened up tolerance
120-001065	Mount, Paperpath Right-side	18	100162	DOC	Opened up tolerance
120-001066	Baffle, Jam clearance Print path	7	100162	DFM	Opened up tolerance
120-001067	Baffle, Upper Print path	16	100162	DFM	Opened up tolerance
120-001068	Baffle, CIS mount	17	100162	DOC	Opened up tolerance
120-001069	Baffle, Lower Print path	5	100162	DOC	Opened up tolerance
120-001078	SPACER, HINGE PCOS 410A	13	100162	DFM	Opened up tolerance
120-001085	BASE: THERMAL PRINTER ROLL GUIDE	8	100162	AVL	PEM AVL was added
120-001094	COVER, GUIDE	4	100162	DFM	Opened up tolerance
128-000017	Handle: PCOS 410A	4	100162	DFM	Opened up tolerance
128-000019	Adapter: Keymat	4	100162	DOC	Opened up tolerance
128-000034	COVER MONITOR BEZEL FRONT	4	100162	DOC	Added slot in plastic eliminate cable pinching
128-000035	COVER MONITOR REAR	4	100162	DOC	Opened up tolerance
128-000036	COVER PRIVACY FLAP RIGHT	4	100162	DOC	Opened up tolerance
128-000037	COVER PRIVACY FLAP LEFT	4	100162	DOC	Opened up tolerance
128-000038	COVER PRIVACY FLAP TOP	4	100162	DOC	Opened up tolerance
128-000039	SUPPORT ARM, MONITOR	5	100162	DOC	Opened up tolerance
128-000042	COVER MAIN	4	100162	DOC	Opened up tolerance
128-000043	COVER RIGHT	5	100162	DOC	Opened up tolerance
128-000044	COVER FRONT	4	100162	DOC	Opened up tolerance
128-000045	DOOR THERMAL PRINTER	5	100162	DOC	Opened up tolerance

Item #	Description	Rev	ECO#	Primary Change Type	Comment
128-000047	DOOR RIGHT LONG	4	100162	DOC	Opened up tolerance
128-000048	HANDLE LEFT	4	100162	DOC	Opened up tolerance
128-000049	DOOR, JAM CLEARANCE	4	100162	DOC	Opened up tolerance
180-001002	PCOS-410A UNIT LEVEL ASEMBLY	36	100170	DFM	Updated CFO card programming procedure; added Loctite to mounting foot screws
180-001002	PCOS-410A UNIT LEVEL ASEMBLY	37	100171	PART	Added tie wrap and wire saddle to prevent cables from rubbing on edge of side frame; added second label for base BoM revision number and IR firmware version
180-001002	PCOS-410A UNIT LEVEL ASEMBLY	39	100172	PART	Added pad printing to ballot input slot area to improve usability for voters; trimmed length of EMI gasket part by 2mm

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## ImageCast Evolution BOX-410A Engineering Change Orders

### Change Type Legend

Abbrev.	Description
AVL	Approved Vendors List Change
DFM	Design for Manufacturing Change
PART	Part Change

Item #	Description	Rev	ECO#	Primary Change Type	Comment
112-000750	HOOK BOLT	1	n/a	PART	Replaced 134-000009, CABLE ROUTING WIRE BRACKET with 112-000750 HOOK BOLT
165-000007	BALLOT BOX TUB ASSY, ICE	n/a	n/a	PART	Removed 3 tie wraps (112-000680); determined they were not needed in design
165-000030	BALLOT BOX ICE LID ASSY	n/a	n/a	PART	Removed light mast assy and created separate kit 172-000019
136-000031	MYLAR, AUX BIN	1	n/a	PART	Add part to AUX bin for improved paper stacking
112-000720	Velcro Loop, 3 in	1	n/a	PART	Add part to AUX bin for improved paper stacking
112-000715	Velcro Hook, 3 in	1	n/a	PART	Add part to AUX bin for improved paper stacking
136-000030	MYLAR, LID, AUX COMPARTMENT	3	n/a	PART	Add part to AUX compartment for improved paper stacking
112-000720	Velcro Loop, 8.5 in	1	n/a	PART	Add part to AUX compartment for improved paper stacking
112-000715	Velcro Hook, 8.5 in	1	n/a	PART	Add part to AUX compartment for improved paper stacking
112-000720	Velcro Loop, 4 in	1	n/a	PART	Add Velcro pair to aid in holding Diverter Bin in tub
112-000715	Velcro Hook, 3 in	1	n/a	PART	Add Velcro pair to aid in holding Diverter Bin in tub
112-000720	Velcro Loop, 4 in	1	n/a	PART	Add Velcro pair to aid in holding AUX Bin in tub
112-000715	Velcro Hook, 3 in	1	n/a	PART	Add Velcro pair to aid in holding AUX Bin in tub
109-000629	ICE LOCKING BRACKET	3	n/a	PART	Changed tab angle for usability
109-000629	ICE LOCKING BRACKET	4	n/a	PART	Changed profile to increase strength

**Page No. B-31 of 35**  
**Test Report No. T71372.01-01**

Page No. A-10 of 14  
 Certification Test Plan T71372.01-01 Rev B

Item #	Description	Rev	ECO#	Primary Change Type	Comment
109-000708	BRACKET: STRAIN RELIEF	2	n/a	PART	Changed profile for better fit with strain relief
109-000607	DOOR LOCK CAM	4	n/a	PART	Removed return spring hole; changed profile
134-000010	SPRING TORSION, DOOR LATCH, PLASTIC BALLOT BOX	1	n/a	PART	Removed part
109-000610	DOOR LOCK ANTI ROTATION RING	6	n/a	PART	Removed return spring hole
109-000568	SUPPORT BRACKET-LID LOCK	3	100150	PART	Prior to pilot: Remove center tab, not required
109-000717	EXTENSION, LIGHT POST	3	100150	PART	Prior to pilot: Remove slots, not required
109-000729	CAM COVER LOCK	4	100150	PART	Changed profile
165-000050	BALLOT BOX COVER ASSY	6	100168	PART	Changed tab (was 109-000778) to powder coated (109-000785)
120-000117	BALLOT BOX TUB	2	100168	PART	Add production drawing; changed material
165-000030	BALLOT BOX ICE LID ASSY	7	100169	PART	Replaced screw 112-000732 with screw 112-001027 (4 per)
120-000112	HANDLE, FRAME, BB	4	100180	PART	Color changed to 431C
120-000114	CASTER STAND-OFF	4	100180	PART	Color changed to 431C
120-000116	SWITCH BRACKET-MAIN BB DOOR INTRUSION	4	100180	PART	Color changed to 431C
120-000118	TUB LIP	5	100180	PART	Color changed to 431C
120-000111	DOOR FRAME-BB-INNER	5	100180	PART	Color changed to 431C
120-000125	FOOT, BALLOT BOX, LID	4	100180	PART	Color changed to 431C
120-000108	SIDING DOOR-AUX SLOT	4	100180	PART	Color changed to 431C
120-000107	AUX DOOR-PLASTIC	4	100180	PART	Color changed to 431C
120-000105	COVER-POWER CORD	4	100180	PART	Color changed to 431C
120-000104	BARBED TUBING HOOK V2	4	100180	PART	Color changed to 431C
120-000100	LOCKING SPRING LEVER	4	100180	PART	Color changed to 431C

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**Page No. B-32 of 35**  
**Test Report No. T71372.01-01**

Page No. A-11 of 14  
 Certification Test Plan T71372.01-01 Rev B

Item #	Description	Rev	ECO#	Primary Change Type	Comment
120-000098	LID HANDLE-MAIN	4	100180	PART	Color changed to 431C
120-000099	SIDE HANDLE-LID	4	100180	PART	Color changed to 431C
120-000097	HANDLE, COVER, PLASTIC BB	4	100180	PART	Color changed to 431C
120-000121	FIXED RAMP, WRITE-IN CHAMBER, ICE	4	100180	PART	Color changed to Natural
120-000122	DOOR-WRITE-IN BIN	4	100180	PART	Color changed to Natural
120-000113	DOOR, BALLOT BOX ACCESS	5	100180	PART	Color changed to 431C
120-000101	ICE WRITE-IN PP RIBS	4	100180	PART	Color changed to Natural
131-001072	HARNES, CAB-218B, MENICS LIGHT POLE CABLE ASSEMBLY	3	100126	AVL	Vendor p/n update
112-000692	RUBBER BUMPER, 1/2" DIA, 1/4" HT, 70A DUR	2	100128	AVL	Add vendor info
136-000023	FOAM STRIP-3/8"X1/2", ANTI-STUFFING	2	100128	AVL	Add vendor info
112-000681	RUBBER TUBING-LONG	3	100138	AVL	Add vendor info
123-000180	2" CASTER RIGID, - PLASTIC BB LID	2	100138	AVL	Add vendor info
112-000687	DRAW LATCH ASSY	2	100150	AVL	Add drawing and changed vendor info
123-000181	VELCRO STRAP 5/8" X 24" CINCH STRAP	2	100168	AVL	Changed vendor part#
165-000007	BALLOT BOX TUB ASSY, ICE	n/a	n/a	DEV	Stand-offs where changed to multipart design to correct vendor error
120-000113	DOOR, BALLOT BOX ACCESS	11	n/a	DFM	Increased thickness of door for moldability
120-000097	HANDLE, COVER, PLASTIC BB	5	n/a	DFM	Made handle shorter to improve in assembly
109-000778	SECURITY TAB, COVER PLASTIC BALLOT BOX	1	n/a	DFM	Add part to 165-000050, COVER ASSY, to aid in moldability of cover 128-000054
109-000568	SUPPORT BRACKET-LID LOCK	3	n/a	DFM	Changed material thickness as per vendor request
109-000586	PLATE: CAM LOCK-AUX DOOR	3	n/a	DFM	Changed material thickness and tolerance as per vendor request.
109-000720	CHANNEL-CASTER BRACKET	3	n/a	DFM	Removed insert and M6 Tapped hole

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**Page No. B-33 of 35**  
**Test Report No. T71372.01-01**

Page No. A-12 of 14  
 Certification Test Plan T71372.01-01 Rev B

Item #	Description	Rev	ECO#	Primary Change Type	Comment
112-000680	CABLE TIE	1	n/a	DFM	Removed insert and M6 Tapped hole
109-000528	PLATE: SUPPORT PART FRONT	3	n/a	DFM	ENLARGED HOLE DIA; CHANGED MATERIAL THICKNESS
109-000528	PLATE: SUPPORT PART FRONT	4	n/a	DFM	Add dimensions
109-000548	PLATE: SUPPORT PART BACK	4	n/a	DFM	ADDED LOCATING HOLE; ENLARGED HOLE DIA;CHANGED MATERIAL THICKNESS
109-000548	PLATE: SUPPORT PART BACK	5	n/a	DFM	Add dimensions
109-000597	DOOR ANTI-STUFFING BRACKET	5	n/a	DFM	Add dimensions
109-000714	HOOK BRACKET-FRONT LOCK AND BIN	3	n/a	DFM	Add slot
109-000715	CABLE GUARD-INTRUSION SWITCH	3	n/a	DFM	Add dimensions
120-000111	DOOR FRAME-BB-INNER	6	n/a	DFM	Increase door clearance
131-000550	HARNESS, CAB-236, PLASTIC BALLOT BOX DOCKING CONNECTOR TO DC POWER JACK AND ID EXTENSION	4	100126	DFM	Length adjustment to accommodate increased tolerances
131-000551	HARNESS, CAB-236E, PLASTIC BALLOT BOX ID SWITCH EXTENSION CABLE	4	100126	DFM	Length adjusted to accommodate increased tolerances. HST3 length and position corrected
131-001058	HARNESS, CAB-235, MCB TO ATI	4	100126	DFM	Length adjustment to accommodate increased tolerances
131-001071	HARNESS, CAB-218A, LIGHT POLE EXTENSION CABLE	5	100126	DFM	Length adjustment to accommodate increased tolerances. Referencing location of labels is corrected.
109-000528	PLATE, SUPPORT PART FRONT	2	100128	DFM	Changed material / tolerances as per vendor request
109-000548	PLATE, SUPPORT PART BACK	2	100128	DFM	Changed material / tolerances as per vendor request
109-000597	DOOR ANTI-STUFFING BRACKET	2	100128	DFM	Changed material / tolerances as per vendor request
109-000607	DOOR LOCK CAM	2	100128	DFM	Changed material / tolerances as per vendor request
109-000610	DOOR LOCK ANTI ROTATION RING	2	100128	DFM	Changed material / tolerances as per vendor request
109-000715	CABLE GUARD-INTRUSION SWITCH	2	100128	DFM	Changed material / tolerances as per vendor request
109-000586	PLATE, CAM LOCK-AUX DOOR	3	100138	DFM	Revised tolerances as per vendor request

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Item #	Description	Rev	ECO#	Primary Change Type	Comment
109-000607	DOOR LOCK CAM	3	100138	DFM	Revised tolerances as per vendor request
109-000729	CAM COVER LOCK	3	100138	DFM	Revised tolerances as per vendor request
128-000054	COVER, BALLOT BOX	3	100138	DFM	Changed Material for pilot
136-000030	MYLAR, LID, AUX COMPARTMENT	2	100138	DFM	Changed material as per vendor request
120-000113	DOOR, BALLOT BOX ACCESS	3	100147	DFM	PRIOR TO PILOT REMOVED FOUR RIBS; CHANGED PART THICKNESS TO IMPROVE MOLD FILLING AND TO PREVENT LOGO FROM CATCHING ON TUB FRAME; REMOVED 1.5 mm FROM TOP
120-000119	AUX BIN	3	100147	DFM	Add molding features (2 holes) as per vendor request
120-000118	TUB LIP	3	100147	DFM	Prior to pilot: CHANGED 4 HOLES TO SLOTS, ADDED 8 CHAMFERS TO IMPROVE FIT WITH TUB
109-000597	DOOR ANTI-STUFFING BRACKET	3	100147	DFM	Increased hole diameter for better fit with inner frame
128-000054	COVER, BALLOT BOX	4	100147	DFM	Increased clearances
120-000111	DOOR FRAME-BB-INNER	3	100147	DFM	Prior to pilot: Add location features
109-000720	CHANNEL-CASTER BRACKET	3	100150	DFM	Opened hole as per pilot build
109-000714	HOOK BRACKET-FRONT LOCK AND BIN	3	100150	DFM	Prior to pilot: Modified part as per vendor request
109-000713	BRACKET-LID CLAMP-INJ MOLDED TUB VERSION	3	100150	DFM	Prior to pilot: Modified part as per vendor request
109-000591	PLATE, LATCH ATTACHMENT	3	100150	DFM	Prior to pilot: Modified part as per vendor request
135-000013	SHAFT-AUX DOOR	3	100150	DFM	Prior to pilot: Modified part as per vendor request
109-000569	PRIVACY SCREEN BRACKET	3	100168	DFM	Add production drawing; add clearance, changed material
109-000629	ICE LOCKING BRACKET	3	100168	DFM	Add production drawing; add clearance, changed material
120-000111	DOOR FRAME-BB-INNER	4	100168	DFM	Add production drawing; changed material & color
120-000112	HANDLE, FRAME, BB	3	100168	DFM	Add production drawing; changed material & color
120-000114	CASTER STAND-OFF	3	100168	DFM	Add production drawing; changed material & color

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Item #	Description	Rev	ECO#	Primary Change Type	Comment
120-000116	SWITCH BRACKET-MAIN BB DOOR INTRUSION	3	100168	DFM	Add production drawing; changed material & color
120-000118	TUB LIP	4	100168	DFM	Add production drawing; changed material & color
120-000098	LID HANDLE-MAIN	3	100168	DFM	Add production drawing; changed material & color
120-000099	SIDE HANDLE-LID	3	100168	DFM	Add production drawing; changed material & color
120-000100	LOCKING SPRING LEVER	3	100168	DFM	Add production drawing; changed material & color
120-000101	ICE WRITE-IN PP RIBS	3	100168	DFM	Add production drawing; changed material & color
120-000104	BARBED TUBING HOOK V2	3	100168	DFM	Add production drawing; changed material & color
120-000105	COVER-POWER CORD	3	100168	DFM	Add production drawing; changed material & color
120-000107	AUX DOOR-PLASTIC	3	100168	DFM	Add production drawing; changed material & color
120-000108	SIDING DOOR-AUX SLOT	3	100168	DFM	Add production drawing; changed material & color
120-000121	FIXED RAMP, WRITE-IN CHAMBER, ICE	3	100168	DFM	Add production drawing; changed material & color
120-000122	DOOR-WRITE-IN BIN	3	100168	DFM	Add production drawing; changed material & color
120-000113	DOOR, BALLOT BOX ACCESS	4	100168	DFM	Add production drawing; changed material & color
120-000097	HANDLE, COVER, PLASTIC BB	3	100168	DFM	Add production drawing; changed material & color
120-000125	FOOT, BALLOT BOX, LID	3	100168	DFM	Add production drawing; changed material & color
180-000010	BOX-410A, PCOS-410A PLASTIC BALLOT BOX, INJECTION MOLDED	13	100186	PART	Key Tag needed to hold the keys together. Label Stickers for SN and BOM Revision labeling.

**APPENDIX C**  
**NOTICES OF ANOMALY**



<b>NOTICE OF ANOMALY</b>		<b>DATE: 11/27/2013</b>
Notice No: 1	P.O. Number: PO0005875	Contact No: N/A
Customer: Dominion Voting Systems	Wyle Job Number: T71372.01	
Notification Made To: Ian Piper	Notification Date: 11/27/2013	
Notification Made By: Ryan Wilson	Via: Email	
Category: <input checked="" type="checkbox"/> Specimen <input type="checkbox"/> Procedure <input type="checkbox"/> Test Equipment	Date of Anomaly: 11/26/2013	
Part Name: ImageCast Evolution, Firmware ver. 4.14.12	Part Number:	
Test: Functional Tests	Serial/ID Number: AAFEBDW0117	
Specification: 2005 VVSG Volume II	Paragraph/Section Number: 6.7	

**REQUIREMENTS:**

**2005 VVSG Volume II section 6.2.1**

A Functional Configuration Audit (FCA) of the voting system shall be performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA is to verify that the voting system performs as documented in the Dominion-supplied technical documentation during the Democracy Suite 4.14-B test campaign.

**DESCRIPTION OF ANOMALY:**

During Functional Testing, the ImageCast Evolution (ICE) unit #2 with Firmware ver. 4.14.12, did not handle Acclaimed Voting as expected. In the AuditMark appended to the ballot images, the ICE unit did not list the inherent undervotes related to an acclaimed contest in which the Vote For value is larger than the number of available candidates. The issue was documented and testing was completed.

**DISPOSITION \* COMMENTS \* RECOMMENDATIONS:**

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21  Yes  No

Responsibility to analyze anomalies and comply with 10 CFR PART 21  Customer  Wyle

CAR Required:  Yes  No CAR Number:

**VERIFICATION**

Test Witness: None	Project Engineer: <i>[Signature]</i> 11/27/13
Representing: N/A	Project Manager: <i>[Signature]</i> 11/27/13
Quality Assurance: <i>[Signature]</i> 12/08/13	



<b>NOTICE OF ANOMALY</b>		<b>DATE: 12/3/2013</b>	
Notice No: 2	P.O. Number: PO0005875	Contact No: N/A	
Customer: Dominion Voting Systems		Wyle Job Number: T71372.01	
Notification Made To: Ian Piper		Notification Date: 12/3/2013	
Notification Made By: Ryan Wilson		Via: Email	
Category: <input checked="" type="checkbox"/> Specimen <input type="checkbox"/> Procedure <input type="checkbox"/> Test Equipment	Date of Anomaly: 10/27/2013 - 12/3/2013		
Part Name: Democracy Suite 4.14-B	Part Number: --		
Test: Source Code Review	Serial/ID Number: --		
Specification: 2005 VVSG Volume I	Paragraph/Section Number: 5		

**REQUIREMENTS:**

**2005 VVSG Volume I section 5**

Software used in voting systems shall meet the essential design and performance characteristics detailed in Section 5 of the EAC 2005 VVSG.

**DESCRIPTION OF ANOMALY:**

Review of the submitted source code modules comprising the Democracy Suite 4.14-B system revealed deviations from the standard. These anomalies are documented in detail in the Wyle generated review reports on file as raw data.

**DISPOSITION \* COMMENTS \* RECOMMENDATIONS:**

Upon completion of the review for each source code submission, a technical summary report of all identified standards violations was sent to Dominion for resolution. Dominion then corrected the reported violations and re-submitted the source code for re-review. This process was repeated as many times as necessary until all identified standards violations were corrected.

Potential 10 CFR Part 21  Yes  No

Responsibility to analyze anomalies and comply with 10 CFR PART 21  Customer  Wyle

CAR Required:  Yes  No CAR Number:

**VERIFICATION**

Test Witness: None

Project Engineer: *Ryan Smith* 12/3/13

Representing: N/A

Project Manager: *Fred Pratt* 12/3/13

Quality Assurance: *Michael Lopez* 12/03/2013