wyle laboratories

Wyle Laboratories, Inc.
7800 Highway 20 West
Huntsville, Alabama 35806
Phone (256) 837-4411 • Fax (256) 721-0144
www.wyle.com

TEST REPORT

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NATIONAL CERTIFICATION TEST REPORT

CERTIFICATION TESTING OF THE DOMINION DEMOCRACY SUITE VERSION 4.14 VOTING SYSTEM

EAC CERTIFICATION NUMBER – DemSuite-4-14

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 9 day of July 20 13

Sandra A. Kahuel
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.

PREPARED BY: Michael L Walker 7-9-13
Michael L. Walker, Senior Project Engineer Date

APPROVED BY: Frank Padilla 7-9-13
Frank Padilla, Voting Systems Manager Date

WYLE Q. A.: Brenda Mace 7/9/13
For Raul Terceno, Q. A. Manager Date

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1.0 INTRODUCTION

1.1 Scope

This report presents the test results for the certification testing campaign of the Dominion Voting Systems Democracy Suite 4.14. The primary purpose of the Certification Testing was to demonstrate that the system meets or exceeds the requirements of the Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG). The certification test procedure was intended to discover non-conformities to the EAC 2005 VVSG for system operations which, should they occur in actual election use, could result in failure to complete election operations in a satisfactory manner. The tests were also intended to demonstrate system compliance with levels of design, performance, and quality claimed by the manufacturer.

The focus of this test campaign was to test all additions and modifications made to the Democracy Suite 4.0 Software, Hardware, and Firmware since the last certification, which was granted by the EAC on May 10, 2012. Wyle performed functional testing on the ImageCast Evolution (ICE), ImageCast Precinct (ICP), ImageCast Central (ICC), and the Election Management System (EMS) to verify all changes made by this upgrade.

This report is valid only for the system identified in Section 2.0 of this 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.

The following items listed encompass the modifications of the Democracy Suite 4.0 system.

1. Election Management System (EMS) – Software upgrades.

2. ImageCast Evolution (ICE) – Hardware and software upgrades and introduction of plastic ballot box.

3. ImageCast Precinct (ICP) – Hardware and software upgrades.

4. ImageCast Central (ICC) – Software upgrades.

Preliminary EMI Quick Scans were performed on the ICE and ICP tabulators for comparison to the baseline emissions noted during the prior test campaign. The outcome revealed improved emission levels for both tabulators, which resulted in the acceptance of the previous hardware tests as noted in tables 4-1 and 4-2.

The complete system was tested in a full system integration test to ensure all components interacted properly in the current system configuration listed in the Dominion 4.14 Voting System scope.

1.2 Objective

The objective of this system modification test program was to ensure that the Dominion Voting Systems Democracy Suite 4.14 complied with the hardware and software requirements of the EAC 2005 VVSG. The scope and detail of the requirements tested in certification were selected to correspond to the scope of the system detailed in the application submitted by Dominion Voting Systems. An in-depth examination of the system further confirmed the applicable requirements selected for compliance testing. This included the inspection and evaluation of system documentation, and the execution of functional tests to verify system performance and function under normal/abnormal conditions.

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 – 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 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, Notices of Anomaly, as-run Certification Test Plan, Deficiency Report, and Additional State-Level Testing.

1.4 Customer

Dominion Voting Systems
1201 18th 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
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006

1.5 References (Continued)

- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- Wyle Laboratories' Quality Assurance Program Manual, Revision 5
- 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 and Notices of Clarification (listed on www.eac.gov)
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation and Notices of Clarification (listed on www.eac.gov)

A listing of the Democracy Suite 4.14 Voting System Technical Data Package (TDP) Documents submitted for this test effort is listed in Section 2.5, "Vendor Technical Data Package."

2.0 SYSTEM IDENTIFICATION AND OVERVIEW

2.1 System Overview

The Dominion Democracy Suite 4.14 Voting System is a modification to the certified Democracy Suite 4.0 Voting System. The full Dominion Democracy Suite 4.0 Voting System description can be found in the EAC Certificate of Conformance, dated May 10, 2012. The Dominion Democracy Suite 4.14 Voting System includes modifications to all components listed below.

The Dominion Voting Systems Democracy Suite Version 4.14 Voting System is a paper-ballot based, optical scan voting system. The Democracy Suite Version 4.14 Voting System hardware consists of four major components:

1. The Election Management System (EMS)
2. ImageCast Evolution (ICE) precinct scanner with optional ballot marking capabilities
3. ImageCast Precinct (ICP) precinct scanner
4. ImageCast Central (ICC) central count scanner

The Dominion Voting System Technical Data Package was the source for much of the summary information that follows in this section.

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

The following paragraphs address the design methodology and product description of the Democracy Suite Version 4.14 Voting System as taken from the Dominion Voting Systems, Inc. Technical Documentation Package.

1. Election Management System

The Dominion Voting Systems Democracy Suite 4.14 EMS consists of eight components running as either a front-end/client application or as a back-end/server application. Below is a list and brief description of each.

- Democracy Suite 4.14 EMS Election Event Designer client application - integrates election definition functionality and represents a main pre-voting phase end-user application.
- Democracy Suite 4.14 EMS 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.
- Democracy Suite 4.14 EMS 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.
- Democracy Suite 4.14 EMS Data Center Manager client application - represents a system level configuration application used in EMS back-end data center configuration.
- Democracy Suite 4.14 EMS Application Server application - represents a server side application responsible for executing long running processes, such as rendering ballots, generating audio files and election files.
- Democracy Suite 4.14 EMS 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, and election files.
- Democracy Suite 4.14 EMS Database Server application - represents a server side RDBMS repository of the election project database which holds all the election project data, such as districts, precincts, candidates, contests, ballot layouts, tabulators, vote totals, and poll status.
- Democracy Suite 4.14 EMS Election Data Translator (EDT) – Exports and Imports data in a format suitable for rapid interaction with Election Event Designer (EED)

The EMS platform was tested in two deployable physical hardware configurations:

EMS Express hardware configuration - all EMS software components were installed on a single physical PC or laptop. This is a stand-alone configuration.

EMS Standard hardware configuration - the EMS server components were installed on a single physical server, in addition to the Local Area Network (LAN) switch devices, while the EMS client components were installed on one or more physical PCs or laptops. All system components were interconnected in a client-server local LAN environment.

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

2. ImageCast Evolution (ICE) Precinct Ballot Tabulator

The Dominion Democracy Suite ImageCast Evolution System employs a precinct-level optical scan ballot counter (tabulator) in conjunction with an external ballot box. 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 secure ballot box. The system also features binary input devices which permit voters who cannot negotiate a paper ballot to generate a synchronously human and machine-readable ballot from elector-input vote selections. The supported binary input devices include a Sip and Puff device, Foot Pedals, and Audio Tactile Interface (ATI). In this sense, the ImageCast Evolution acts as a ballot marking device. These devices are interchangeable and may be shared between the ICE and ICP units. In addition, ballots marked by the ImageCast Evolution may be subsequently scanned on the ImageCast Precinct or ImageCast Central if needed for a recount.

Figure No. 1
View of ICE Precinct Ballot Tabulator

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

3. ImageCast Precinct (ICP) Precinct Ballot Tabulator

The 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 safely store and tabulate each vote from each paper ballot. Like the ImageCast Evolution, the ImageCast Precinct also supports enhanced accessibility voting which may be accomplished by connecting the interchangeable Sip and Puff device, Foot Pedals, or Audio Tactile Interface (ATI).

Figure No. 2
View of ICP Precinct Ballot Counter with tabulator cover

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

4. Central Tabulator: ImageCast Central Count (ICC)

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

- Canon DR-X10C Scanner: used to provide ballot scanning and image transfers to the local ImageCast Central Workstation.
- ImageCast Central Workstation: a COTS computer used for ballot image and election rules processing and results transfer to the EMS Datacenter. The ImageCast Central Workstation is COTS hardware which executes software for both image processing and election rules application. An example of an Election Rule in this instance would be "Vote for 2."

Figure No. 3
Canon DR-X10C Scanner and ImageCast Central Workstation

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

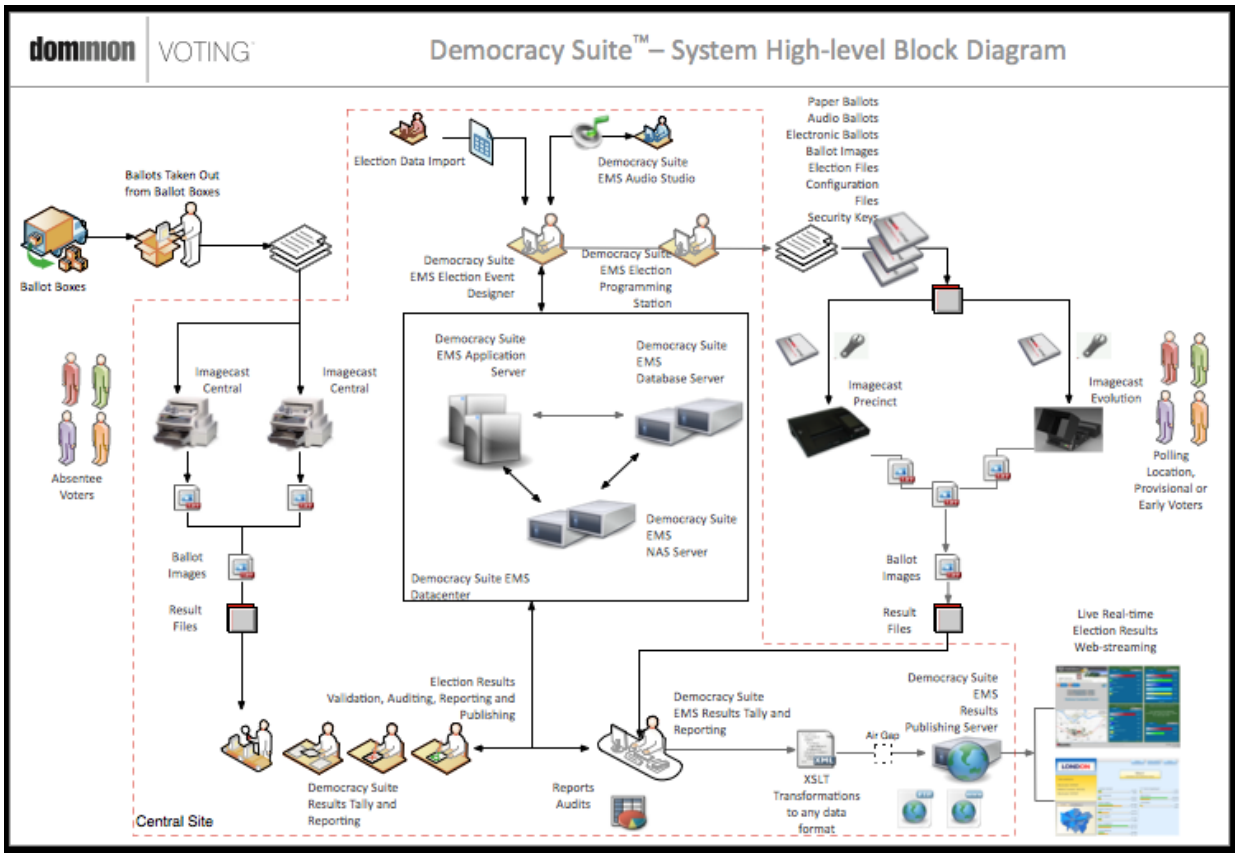

Figure 4
System Overview Diagram

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2 System Limits

Table 2-1 Democracy Suite 4.14 System Limits

Limit (Maximum Number of)	Value (by configuration)		Limiting Component
	Express	Standard	
Ballot Positions	462	462	22 Inch Portrait Ballot
Precincts in Election	250	1000	Memory
Contests in Election	250	4000	Memory
Candidates/Counters in Election	2500	40000	Memory
Candidates/Counters in Precinct	462	462	22 Inch Portrait Ballot
Candidates/Counters in Tabulator	2500	10000	Memory
Ballot Styles in Election	750	4000	Memory
Contests in a Ballot Style	156	156	22 Inch Portrait Ballot
Candidates in a Contests	231	462	22 Inch Portrait Ballot (Column Span 3)
Ballot Styles in a Precinct	5	5	Memory
Number of Parties	30	30	22 Inch Portrait Ballot
Vote For in Contest	30	30	22 Inch Portrait Ballot
Supported Languages per Election	5	5	Memory
Number of Write-ins	462	462	22 Inch Portrait Ballot

2.3 Software

This section defines the two types of software required for testing: software used for the testing of hardware, software, security and system integration; and supporting software required for the test environment (operating systems, compliers, assemblers, database managers, and any other supporting software). All COTS third-party software was downloaded or retrieved by Wyle Laboratories' qualified personnel. These products were verified not to have been modified and were built into the Democracy Suite for the entire test campaign. Wyle Laboratories believes these components to have proven performance in other commercial applications. The tables that follow list COTS and non-COTS software components used in this test program.

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-2 Democracy Suite 4.14 EMS Software Platform Components

Software Required For Testing	Software Version	Filename
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
Democracy Suite EMS File System Service Client Application	4.14.23	setup.exe, DemocracySuiteEMS_FSS_Setup.msi
Democracy Suite EMS Audio Studio Client Application	4.14.23	setup.exe, EMSAS2010Setup.msi
Democracy Suite EMS Data Center Manager	4.14.23	DemocracySuiteEMS_DCM.exe
Democracy Suite EMS Application Server	4.14.23	setup.exe, EMSApplicationServer_FED_CERT.Setup_x64.Setup.msi

Table 2-3 Democracy Suite 4.14 ImageCast Precinct Software Components

Software Required For Testing	Software Version	Filename
Election Firmware	4.14.5-US	cf2xx.sig
Firmware Updater	4.14.5-US	firmUp.enc
Firmware Extractor	4.14.5-US	FirmwareExtract.enc
Kernel (uClinux)	4.14.5-US	Image.bin.gz
Boot Loader (COLILO)	20040221	colilo.bin

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-4 Democracy Suite 4.14 ImageCast Evolution Software Components

Software Required For Testing	Software Version	Filename
Voting Machine	4.14.10	GApplication-4.14.10.vhd.7z
Election Application	4.14.10	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

Table 2-5 Democracy Suite 4.14 ImageCast Central Software Components

Software Required For Testing	Software Version	Filename
ImageCast Central Application	4.14.4	ImageCast Central.exe
Image-Analysis DLL	4.14.4	ImgProc.dll
Windows 7	Professional x64 or X86 with SP1	Operating System for COTS ICC computer when using Canon DR-X10C scanner

Table 2-6 Democracy Suite 4.14 EMS Software Platform Third Party Software Components

Software Required For Testing	Software Version	Filename
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi
TX Text Control Library for .NET	16.0	TX Text Control.NET for Windows Forms 16.0.exe

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-7 Democracy Suite 4.14 EMS Client Application Software Components

Software Required For Testing	Software Version	Filename
Microsoft Windows 7 x64	6.1	Microsoft DVD provided
Windows Server 2008 R2 x64	6.1	Microsoft DVD provided
Adobe Reader	10.1.1	AdbeRdr1011_en_US.exe
Microsoft .NET Framework 4.0	4.0	dotNetFx40_Full_x86_x64.exe
Microsoft SQL Server 2008 R2 x64	10.0	Microsoft DVD provided
Microsoft SQL Server 2008 Express R2 x64	10.50.4000.0	SQLEXPRADV_x64_ENU.exe
Microsoft SQL Server 2008 R2 SP1x64	10.50.4000.0	SQLServer2008R2SP2-KB2630458-x64-ENU.exe
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	vjredist64.exe
1-Wire Driver version 4.0.3b x64	4.0.3	install_1_wire_drivers_x64_v403beta.msi
Java Runtime Environment 6.0 x64	6.0.290	jre-6u29-windows-x64.exe
Microsoft Visual C++ 2010 SP1 Redistributable Package(x86)	10.0.40219	vcredist_x86.exe
Microsoft Access Database Engine 2010 Redistributable	1 (published 12/16/2010)	AccessDatabaseEngine.exe AccessDatabaseEngine_x64.exe

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-8 Democracy Suite 4.14 EMS Software Platform Unmodified COTS Components

Software Required For Testing	Software Version	Filename
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi (for details see document Components_3rdParty_1.0.xlsx)
TX Text Control Library for .NET	16.0	TX Text Control.NET for Windows Forms 16.0.exe (for details see document Components_3rdParty_1.0.xlsx)
Microsoft.Net Framework Library	4.0	dotNetFx40_Full_x86_x64.exe (for details see document Components_3rdParty_1.0.xlsx)
Sox	14.3.1	sox.exe,libgomp-1.dll,pthreadgc2.dll,zlib1.dll (for details see document Components_3rdParty_1.0.xlsx)
Log4net	1.2.10	log4net.dll, log4net.xml (for details see document Components_3rdParty_1.0.xlsx)
NLog	1.0.0.505	NLog.dll (for details see document Components_3rdParty_1.0.xlsx)
iTextSharp	5.0.5.0	itextsharp.dll (for details see document Components_3rdParty_1.0.xlsx)
OpenSSL	1.1.2	openssl.exe, lebeay32.dll, ssleay32.dll (for details see document Components_3rdParty_1.0.xlsx)
SQLite	1.0.65.0	System.Data.SQLite.DLL 32-bit and 64-bit (for details see document Components_3rdParty_1.0.xlsx)
Lame	3.99.4	lame.exe (for details see document Components_3rdParty_1.0.xlsx)
Speex	1.0.4	speexdec.exe and speexenc.exe (for details see document Components_3rdParty_1.0.xlsx)
Ghostscript	9.04	gsdll32.dll – both 32-bit and 64-bit (for details see document Components_3rdParty_1.0.xlsx)
PdfToImage	1.2	PdfToImage.dll (for details see document Components_3rdParty_1.0.xlsx)
SharpSSh package	1.1.1.13	Tamir.SharpSSH.dll, Diffie.Hellman.dll, Org.Mentalis.Security.dll (for details see document Components_3rdParty_1.0.xlsx)
One Wire API for .NET	4.0.2.0	OneWireAPI.NET.dll (for details see document Components_3rdParty_1.0.xlsx)
Avalon-framework-cvs-20020806	20020806	avalon-framework-cvs-20020806.jar (for details see document Components_3rdParty_1.0.xlsx)
Batik	0.20-5	batik.jar (for details see document Components_3rdParty_1.0.xlsx)
Fop	0.20-5	fop.jar (for details see document Components_3rdParty_1.0.xlsx)
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	vjc.dll,vjsjbc.dll,vjslibcw.dll,vjsnativ.dll,vjssupuilib.dll,vjsvwaux.dll (for details see document Components_3rdParty_1.0.xlsx)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-9 Democracy Suite 4.14 ImageCast Precinct Unmodified COTS Software Components

Software Required For Testing	Software Version	Filename
PNG Reference Library	1.2.24	libpng-1.2.24.tar.gz
OpenSSL	1.1.2	Openssl-fips-1.1.2.tar.gz
Zlib	1.2.3	Zlib-1.2.3.tar.gz

Table 2-10 Democracy Suite 4.14 ImageCast Evolution Unmodified COTS Software Components

Software Required For Testing	Software Version	Filename
busybox	1.20.2	busybox-1.20.2.tar.bz2
e2fsprogs	1.42.4	e2fsprogs-1.42.4.tar.gz
expat	2.1.0	expat-2.1.0.tar.gz
fontconfig	2.9.0	fontconfig-2.9.0.tar.gz
freetype	2.4.9	freetype-2.4.9.tar.bz2
i2c-tools	3.1.0	i2c-tools-3.1.0.tar.bz2
libjpeg	v8d	jpegsrc.v8d.tar.gz
libogg	1.3.0	libogg-1.3.0.tar.gz
libpng	1.5.10	libpng-1.5.10.tar.gz
libusb	1.0.8	libusb-1.0.8.tar.bz2
libusb-compat	0.1.3	libusb-compat-0.1.3.tar.bz2
linux	2.6.30.9	linux-2.6.30.9.tar.bz2
openssl-fips	1.2.3	openssl-fips-1.2.3.tar.gz
ppp	2.4.5	ppp-2.4.5.tar.gz
qt-everywhere	4.7.3	qt-everywhere-opensource-src-4.7.3.tar.gz
skell	1.19	skell-1.19.tar.gz
soundtouch	1.6.0	soundtouch-1.6.0.tar.gz
speex	1.2rc1	speex-1.2rc1.tar.gz
sqlite	3.7.13	sqlite-autoconf-3071300.tar.gz

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-10 Democracy Suite 4.14 ImageCast Evolution Unmodified COTS Software Components (Continued)

Software Required For Testing	Software Version	Filename
sysfsutils	2.1.0	sysfsutils-2.1.0.tar.gz
tiff	4.0.1	tiff-4.0.1.tar.gz
tzcode	2012b	tzcode2012b.tar.gz
tzdata	2012c	tzdata2012c.tar.gz
usb-modeswitch	1.2.4	usb-modeswitch-1.2.4.tar.bz2
usb-modeswitch-data	20120815	usb-modeswitch-data-20120815.tar.bz2
zlib	1.2.7	zlib-1.2.7.tar.bz2
log4cplus	1.0.4.1	log4cplus-1.0.4.1.tar.bz2
quazip	0.5	quazip-0.5.tar.gz

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-10 Democracy Suite 4.14 ImageCast Evolution Unmodified COTS Software Component (Continued)

Software Required For Testing	Software Version	Filename
u-boot-tools	1.1.6	u-boot-tools-1.1.6.tar.bz2
unifdef	1.0	unifdef-1.0.tar.gz
usb-modeswitch	1.2.4	usb-modeswitch-1.2.4.tar.bz2
usb-modeswitch-data	20120815	usb-modeswitch-data-20120815.tar.bz2
wget	1.9.1	wget-1.9.1.tar.gz
yaffs_utils	20060418	yaffs_utils-20060418.tar.gz
zlib	1.2.7	zlib-1.2.7.tar.bz2
rpm	4.0.4	rpm-4.0.4.tar.gz
log4cplus	1.0.4.1	Log4cplus-1.0.4.1.tar.bz2
quazip	0.5	quazip-0.5.tar.gz

Table 2-11 Democracy Suite 4.14 - ImageCast Central Build Environment Software Build Components (Unmodified COTS)

Software Required For Build	Software Version	Filename
Windows 7	Home Premium	OEM installed, or full CD from Microsoft
Visual Studio	2005	Full CD from Microsoft

Table 2-12 Democracy Suite 4.14 - ImageCast Central Build Environment Setup Software Utilities (Unmodified COTS)

Software Required For Build	Software Version	Filename
7-Zip	9.20	7z920.exe
Active Perl 64-bit	5.12.4.1205	ActivePerl-5.12.4.1205-MSWin32-x64-294981.msi
Nasm	2.09.07	nasm-2.09.07-win32.zip

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-13 Democracy Suite 4.14 - ImageCast Central Software Build Library Source Code (Unmodified COTS)

Software Required For Build	Software Version	Filename
OpenSSL	FIPS 1.2.3	openssl-fips-1.2.3.tar.gz

Table 2-14 Democracy Suite 4.14 - ImageCast Central Runtime Software Components (Unmodified COTS)

Software Required For Testing ICC application	Software Version	Filename
Imgcomp.dll	2.11	apiman.zip
1 Wire driver 64-bit	4.03	install_1_wire_drivers_x64_v403.msi
Kofax VRS	4.50	Full CD from Kofax
VCredist	4/10/2006	vcredist_x86.exe

Table 2-15 Democracy Suite 4.14 ImageCast Precinct Modified COTS Software Components

Software Required For Testing	Software Version	Filename
uClinux	20070130	uClinux-dist-20070130.tar.gz
COLILO Boot Loader	20040221	Colilo20040221.tar.gz

Table 2-16 Democracy Suite 4.14 ImageCast Evolution Modified COTS Software Components

Software Required For Testing	Software Version	Filename
Kernel	2.6.30.9-dvs-21	uImage
U-BOOT	1.3.4.29	u-boot.bin

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-17 Democracy Suite 4.14 EMS Software Build Environment Components

Software Required For Testing	Software Version	Filename
Microsoft Windows Server 2008 R2 x64	6.1	Microsoft DVD provided
7-Zip	9.20	7z920-x64.msi
Microsoft Visual Studio 2010	10.0	Microsoft DVD provided
Microsoft SDK for Windows 7	7.1	GRMSDKX_EN_DVD.iso
Microsoft.NET Framework Library	4.0	dotNetFx40_Full_x86_x64
Microsoft Visual Studio 2010 Service Pack 1	10.0 SP1	VS2010SP1dvd1.iso
Microsoft patch KB2286556	N/A	VS10-KB2286556-x86.exe
ImgBurn	2.5.7.0	SetupImgBurn_2.5.7.0.exe
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi
TX Text Control Library for .NET	16.0	TX Text Control.NET for Windows Forms 16.0.exe
Speex	1.0.4	speex_win32_1.0.4_setup.exe
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	vjredist64.exe
ActivePerl	5.14.3	ActivePerl-5.14.3.1404-MSWin32-x64-296513.msi

Table 2-18 Democracy Suite 4.14 ImageCast Precinct Election Firmware Compiler

Software Required For Testing	Software Version	Filename
g++ (GNU C++ compiler)	gcc3.4.0-20040603	m68k-uclinux-tools-c++-gcc3.4.0-20040603.sh

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-19 Democracy Suite 4.14 ImageCast Evolution Election Firmware Compiler

Software Required For Testing	Software Version	Filename
g++ (GNU C++ compiler)	gcc-4.5.38-eglibc-2.11.38	freescale-powerpc-linux-gnu-2011.03-38.i686.rpm

Table 2-20 Democracy Suite 4.14 ImageCast Precinct Firmware Build Environment Components

Software Required For Testing	Software Version	Filename
Ubuntu 10.04 LTS – Long-term support	10.04	ubuntu-10.04.4-desktop-i386.iso
Toolchain Installation Script	N/A	Toolchain.sh
m68k uClinux tools base gcc	3.4.0-20040603	m68k-uclinux-tools-base-gcc3.4.0-20040603.sh
m68k uClinux tools c++ gcc	3.4.0-20040603	m68k-uclinux-tools-c++-gcc3.4.0-20040603.sh
m68k uClinux tools gdb	20040603	m68k-uclinux-tools-gdb-20040603.sh
OpenSSL	1.1.2	Openssl-fips-1.1.2.tar.gz

Table 2-21 Democracy Suite 4.14 ImageCast Evolution Firmware Build Environment Components

Software Required For Testing	Software Version	Filename
Ubuntu	10.04 LTS	ubuntu-10.04.4-desktop-i386.iso
LTIB	10.1.1a	ltib-10-1-1a-sv.tar.gz
g++ (GNU C++ compiler)	gcc-4.5.38-eglibc-2.11.38	freescale-powerpc-linux-gnu-2011.03-38.i686.rpm
autoconf	2.57	autoconf-2.57.tar.bz2
bison	2.3	bison-2.3.tar.bz2
ccache	2.4	ccache-2.4.tar.gz
cksum	19990607	cksum-19990607.tar.gz
cramfs	20081121	cramfs-20081121.tar.gz
distcc	2.18.3	distcc-2.18.3.tar.bz2
dtc	1.2.0	dtc-1.2.0.tar.gz
flex	2.5.33	flex-2.5.33.tar.gz
genext2fs	1.4.1	genext2fs-1.4.1.tar.gz

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-21 Democracy Suite 4.14 ImageCast Evolution Firmware Build Environment Components (Continued)

Software Required For Testing	Software Version	Filename
gen_init_cpio	2.6.25-rc7	gen_init_cpio-2.6.25-rc7.tar.gz
genromfs	0.5.1	genromfs-0.5.1.tar.gz
git	1.5.6.5	git-1.5.6.5.tar.gz
libtool	1.5	libtool-1.5.tar.gz
lkc	1.4	lkc-1.4.tar.gz
mkspooflinks	3.4	mkspooflinks-3.4.tar.gz
mtd-utils	20060302	mtd-utils-20060302.tar.bz2
mux_server	1.0	mux_server.c
pkg-config	0.21	pkg-config-0.21.tar.gz
sparse	0.4	sparse-0.4.tar.gz
texinfo	4.8	texinfo-4.8.tar.bz2
tunctl	1.5	tunctl-1.5.tar.gz
u-boot-tools	1.1.6	u-boot-tools-1.1.6.tar.bz2
unifdef	1.0	unifdef-1.0.tar.gz
wget	1.9.1	wget-1.9.1.tar.gz
yaffs_utils	20060418	yaffs_utils-20060418.tar.gz
rpm	4.0.4	rpm-4.0.4.tar.gz

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Hardware

The system submitted by Dominion Voting Systems, Inc. for certification testing consisted of the following hardware, firmware, and software source code components.

Table 2-22 Democracy 4.14 Voting System Equipment Description

Equipment	Manufacturer	Version/Model	Specifications	Serial Number
PC1	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61VNNM1
PC2	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61TPNM1
PC3	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61YMNM1
PC4	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61TNNM1
PC5	Dell	Inspiron One 2305	Processor: AMD Athlon II X2 240e 2.8 GHz, Memory: 8GB Dual Channel 1333MHz DDR3, Hard Drive Capacity: 1 TB	564C3P1, 563F3P1
PC6	Dell	OptiPlex 9010	Processor: Intel Core i3-3220 3.30 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	627BRW1
LAPTOP1	Dell	Latitude E6530	Intel Core i5 CPU 3230M @ 2.5GHz 4.00 GB Installed RAM HD Capacity 500 GB	2779CW1
LAPTOP2	Dell	Latitude E6530	Intel Core i5 CPU 3230M @ 2.67GHz 4.00 GB Installed RAM HD Capacity 500 GB	1SD9CW1
SERVER1	Dell	PowerEdge R610	Processor: Intel Xeon E5620 2.4 GHz, Memory: 8x 2GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	5M9NNM1
SERVER2	Dell	PowerEdge R610	Processor:Intel Xeon E5620 2.4 GHz, Memory: 8x 2GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	5M8PNM1
SERVER3	Dell	PowerEdge R610	Processor: Intel Xeon E5620 2.4 GHz, Memory: 8x 2GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	5M8QNM1
SERVER4	Dell	PowerEdge T620	Processor: Intel Xeon E5620 2.0 GHz, Memory: 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	9J9NQW1
STORAGE1	Rocstor	Guardian 4RM Raid System	Disk space: 2 TB (Striped + Mirrored), Processor: 400 MHz storage I/O, Hot bus interface: eSATA, Drive bus interface: SATA II	ROC732621047/ SB09010154
STORAGE2	Rocstor	Guardian 4RM Raid System	Disk space: 2 TB, Processor: 400 MHz storage I/O, Hot bus interface: eSATA, Drive bus interface: SATA II	ROC732621045/ SB09010157
STORAGE3	Rocstor	Guardian 4RM Raid System	Disk space: 2 TB, Processor: 400 MHz storage I/O, Hot bus interface: eSATA, Drive bus interface: SATA II	ROC732621046/ SB09010161
STORAGE4	Rocstor	Commander 2UE Portable Hard Drive	Hard Drive Capacity: 500 GB	5VJ4DRJP
STORAGE5	Rocstor	Commander 2UE Portable Hard Drive	Hard Drive Capacity: 500 GB	5VJ48VFJ

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Hardware (Continued)

Table 2-23 Build Machine Description

Equipment	Manufacturer	Version/Model	Serial Number	COTS/ Non-COTS
Build 1	SuperMicro	SuperServer 7045	BM-57381-001	COTS

Table 2-24 Democracy 4.14 COTS Voting System Support Equipment Description

Test Material	Make	Model	Quantity	Serial Number
COTS Central High Speed Scanner	Canon	DR-X10C	2	ED300874, ED300880
iButton (SHA-1) with USB Reader/Writer	Maxim	USB R/W: DS9490R iButton: DS1963S	3	4D027C, 4C9CF5, 514DFD
iButton (SHA-1)	Maxim	DS1963S	20	n/a
LCD Monitor	Soyo	18.5" wide LCD	1	DYLM19R6-KLE-10202
LCD Monitor	Samsung	23" wide LCD	1	MY23HVMS701197B
LCD Monitor	Dell	1909W	4	07E-4EUS, 07F-071S, 07F-06US, 07F-074S
LCD Monitor	Dell	N445N	3	2TWC, 2UOC, 2U6C
Audio Adapter	Soundwave	USB Soundwave 7.1 Audio Adapter	2	SW-57381-001, SW-57381-002
PCI Software	Soundwave	Soundwave 7.1 PCI Software	2	n/a
USB Software	Soundwave	USB Soundwave 7.1 Software	1	n/a
Networking Switch	D-Link	D-Link DES-1105 5-Port Switch	1	DRL728A001397
Mouse	Dell	USB w/rollerball	4	G1A00M0M, 10203JTI, LZA30491960, 438027372
Mouse	Microsoft	USB w/rollerball	1	X800898
Keyboard	Kensington	USB	1	D0713000487
	Microsoft	USB	1	6968200717217
	IBM	USB	1	2162079
Compact Flash Reader	SanDisk	USB	3	0171618, 0201833, 0171631
	GGI Gear	USB	4	CFRW-57381-001 thru 004
Networking Switch	D-Link	DGS-2208 8-Port Switch	2	F36J69C004821, F36J69C004824
Headphones	Sony	MDR-G45LP-01	1	T70251-Sony-01
	Cyber Acoustics	ACM-70	2	DVS123-00048
eSATA PCI Card (Installed into Servers and PCs)	SIIG, Inc.	eSATA II PCIe Pro Card	7	n/a
Sip & Puff	Origin Instruments	Air Voter	7	AV-57381-001 thru 003, 002251, 002268, 002267; DVS 123-000096
Footswitch Pair	Enabling Devices	Rocker Paddle	4	RP-57381-001 thru 004; DVS 123-000100

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Hardware (Continued)

Table 2-24 Democracy 4.14 COTS Voting System Support Equipment Description (Continued)

Test Material	Make	Model	Quantity	Serial Number
Compact Flash Cards	SanDisk	1 GB		SDCFH-1024-388, DVS 123-000033
Compact Flash Cards	SanDisk	2 GB		SDCFH-2048-388; DVS 123-000093
Compact Flash Cards	SanDisk	4 GB		SDCFAA-004G; DVS 123-000119
Compact Flash Cards	SanDisk	8 GB		SDCFAA-008G; DVS 123-000189

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Hardware (Continued)

Table 2-25 Democracy 4.14 Voting System Equipment

Equipment	Description	Serial Numbers
ImageCast Precinct (ICP)	Precinct Count Optical Scanner PSOS 320A	WLDAFBH0005, WLDAFBH0023
ImageCast Precinct (ICP)	Precinct Count Optical Scanner PSOS 320C	WLDAFBH0002, WLDAFBH0018
ImageCast Evolution (ICE)	Precinct Count Optical Scanner PSOS 410A	ICE2P200002, ICE2P200004, CAFEBDB0008, CAFEBDC0015
ICP Ballot Box	Externally Secure Metal Ballot Box	Box-57381-011, Box-57381-012, Box-57381-014
	Externally Secure Plastic Ballot Box	T70251-01
ICE Ballot Box	Externally Secure Metal Ballot Box	Box-57381-015
	Externally Secure Plastic Ballot Box	T70251-Box-02, T70251-Box-03

2.5 Test Tools/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 following test materials are required to support the Democracy Suite 4.14 certification testing:

Table 2-26 Democracy 4.14 Test Support Materials

Test Material	Manufacturer/Description	Quantity
Disposable Mouthpieces	(Sip & Puff) p/n AC-310	20
ATI Handsets	Dominion	7
Black Ballot Privacy Sleeves	Dominion	2
White Ballot Privacy Sleeves	Dominion	4
Black Privacy Labels (set of 2 pieces)	Dominion	4
White Privacy Labels	Dominion	4
Combination Lock	MASTER Lock	1
Keyed Lock	MASTER Lock	2
Memory Flash Cards	SanDisk	50
Ballots	Dominion	6000
Dominion Cleaning Kit	Dominion	2
Permanent Markers	p/n SHARPIE1 BK	10
Thermal Printer Rolls	ICP/ICE Paper Rolls	100
Election Tamper Evident Seals (Silver)	Dominion	20
Tamper Evident Tie Wrap	Dominion	50
Sanitary Headphone Cover	Dominion	10

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.6 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 documents listed in Table 2-27 comprise the Democracy Suite Voting System TDP.

Table 2-27 Democracy Suite 4.14 Voting System TDP

Democracy Suite 4.14 TDP Documents	System	Version	Date	Document Number
Documents describing overall system performance*:*				
Democracy Suite System Configuration Overview	All	1.2.0::261	5/17/13	2.02
System Security Specification	All	1.1.0::326	5/17/13	2.06
Configuration Management Process	All	1.2.0::177	4/9/13	2.11
Quality Assurance Program	All	1.2.0::80	10/16/12	2.12
System Test and Verification	All	1.1.0::104	10/16/12	2.07
Democracy Suite System Test and Verification Test Suites	All	2.0.0::1	2/27/13	2.07
Democracy Suite Readiness Test Procedure	All	1.2.0::95	9/25/12	2.07
Personnel Training and Deployment Requirements	All	1.1.0::53	4/9/13	2.10
Documents describing functionality, hardware, software design, maintenance, and operation:				
EMS Functional Description	EMS	1.1.0::227	10/16/12	2.03
ICE Functional Description	ICE	1.2.0::70	3/27/13	2.03
ICP Functional Description	ICP	1.1.0::109	10/16/12	2.03
ICC Functional Description	ICC	1.1.0::63	4/9/13	2.03
ICE Tabulator System Hardware Specification	ICE	1.2.0::281	4/1/13	2.04
ICP Tabulator System Hardware Specification	ICP	1.1.0::81	3/28/13	2.04
ICE System Hardware Characteristics	ICE	1.2.0::84	10/16/12	2.04
ICP System Hardware Characteristics	ICP	1.1.0::44	10/16/12	2.04
EMS Software and Design Specification	EMS	1.0.0::207	2/19/13	2.05
ICE Software and Design Specification	ICE	1.0.0::102	2/12/13	2.05
ICP Software and Design Specification	ICP	1.1.0::101	10/16/12	2.05
ICC Software and Design Specification	ICC	1.0.0::34	11/30/12	2.05
ICP System Operation Procedures	ICP	1.1.0::169	3/18/13	2.08
EMS System Operation Procedures	EMS	1.2.0::448	3/27/13	2.08
ICE System Operation Procedures	ICE	1.0.0::120	4/19/13	2.08
ICC System Operation Procedures	ICC	1.1.0::103	5/15/13	2.08
ICP System Maintenance Manual	ICP	1.1.0::66	10/16/12	2.09
ICE System Maintenance Manual	ICE	1.1.0::115	10/16/12	2.09
EMS System Maintenance Manual	EMS	1.0.0::50	10/16/12	2.09
Election Event Designer Users Guide	EMS	1.0.1::154	5/16/13	N/A
Results Tally and Reporting Users Guide	EMS	1.0.0::91	5/16/13	N/A
Audio Studio Users Guide	EMS	1.0.0::24	10/16/12	N/A

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.6 Vendor Technical Data Package (Continued)

Table 2-27 Democracy Suite 4.14 Voting System TDP (Continued)

Democracy Suite 4.14 TDP Documents	System	Version	Date	Document Number
ImageCast Precinct Approved Parts List	ICP	Rev: 20	7/10/12	N/A
ImageCast Precinct Device Configuration Files	ICP	2.3.3	7/27/12	N/A
ImageCast Precinct Election Definition Files	ICP	1.0.0::9	9/25/12	N/A
ImageCast Precinct Firmware Build and Install	ICP	4.2.14	9/3/12	N/A
ImageCast Precinct Firmware Update	ICP	1.0.0::12	2/11/13	N/A
ImageCast Precinct Technical Guide	ICP	1.0.0::8	7/27/12	N/A
ICE Technical Guide	ICE	1.0.0::60	7/23/11	N/A
Engineering Product and Development Processes	ICP	P.03	7/23/11	N/A
Dominion Voting C C++ Coding Standard	All	1.0.0::8	7/27/12	N/A
ICE Build Procedure	ICE	1.0.0::44	2/11/13	N/A
ICE Firmware Installation Procedure	ICE	1.0.0::30	12/26/12	N/A
ImageCast Central Build Environment Setup	ICC	2.1.7::13	3/6/13	N/A
ImageCast Central Software Build Procedure	ICC	2.1.7::23	5/23/13	N/A
Dominion Voting Usability Study	ICP	1.0.0::26	7/27/12	N/A
EMS Build Environment Procedure	EMS	2.1.0::10	5/7/13	N/A
Dominion Voting Usability Study	ICE	1.0.0::36	7/13/12	N/A

2.7 Deliverable Materials

The materials listed in Table 2-28 are identified by Dominion Voting Systems to be delivered as part of the Democracy Suite Voting System to the end users.

Table 2-28 Democracy Suite 4.14 Voting System Deliverables

Deliverable Material	Version	Description
Election Event Designer	4.14.22	EMS client application
Results Tally and Reporting	4.14.22	EMS client application
Audio Studio	4.14.22	EMS client application
Application Server	4.14.22	EMS server application
Datacenter Manager	4.14.22	EMS server application
ImageCast Evolution	400A w/Firmware version 4.14.10	Precinct ballot scanner, BMD, and ADA accessible voting device
ImageCast Evolution	410A w/Firmware version 4.14.10	Precinct ballot scanner, BMD, and ADA accessible voting device
ImageCast Precinct	320A w/Firmware version 4.14.5	Precinct ballot scanner and ADA accessible voting device
ImageCast Precinct	320C w/Firmware version 4.14.5	Precinct ballot scanner and ADA accessible voting device
ImageCast Central Count	Canon DR-X10C w/ImageCast software version 4.14.4	Central ballot scanner

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.7 Deliverable Materials (Continued)

Table 2-28 Democracy Suite 4.14 Voting System Deliverables (Continued)

Deliverable Material	Version	Description
ImageCast Evolution Metal Ballot Box	Box-400A	ICE Metal Ballot box
ImageCast Evolution Plastic Ballot Box	Box-410A	ICE Plastic Ballot box
ImageCast Precinct Metal Ballot Box	Box-310A	ICP Metal Ballot box
ImageCast Precinct Plastic Ballot Box	Box-330A	ICP Plastic Ballot box
Rocstor Encrypted NAS	Dell PowerEdge R610	Encrypted Network Attached Storage module for server and data backup
Rocstor Portable Hard Drive	Rocstor Commander 2UE Portable Hard Drive	Encrypted and ruggedized external hard drive
iButton with Reader/Writer	Maxim USB R/W: DS9490R iButton: DS1963S	Security authentication token with programmer
ICE/ICP Headphones	Cyber Acoustics	Headphones used for audio voting
Sip/Puff Device	Origin Instruments Air Voter	Binary input device for disabled voters
Footswitch Pair	Enabling Devices	Binary input device for disabled voters
Compact Flash Cards	SDCFH, SDCFAA	Transport Media
ATI Handset	1.1.0	ADA voting device used in conjunction with Binary input devices
ICP System Operation Procedures	1.1.0::169	TDP Document
EMS System Operation Procedures	1.2.0::448	TDP Document
ICE System Operation Procedures	1.0.0::120	TDP Document
ICC System Operation Procedures	1.1.0::103	TDP Document
ICP System Maintenance Manual	1.1.0::66	TDP Document
ICE System Maintenance Manual	1.1.0::115	TDP Document
Election Event Designer User's Guide	1.0.1::154	TDP Document
Results Tally and Reporting User's Guide	1.0.0::91	TDP Document
Audio Studio User's Guide	1.0.0::24	TDP Document

2.8 End User Documentation

The following documents constitute the deliverables to the end user at election central:

- Democracy Suite EMS Audio Studio User Manual, Version: 1.0.0::24
- Democracy Suite Election Event User Manual, Version: 1.0.1::154
- Democracy Suite Results Tally and Reporting User Manual, Version: 1.0.0::91
- ImageCast Evolution Technical Guide, Version 1.0.0::59
- ICC User Guide, Canon DR-X10C User Manual
- ImageCast Precinct Technical Guide, Version 1.0.0::8

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 Voting System, which includes the items listed in Section 2.0 of this report.

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 FCA and System Integration test utilizing the "Wyle Baseline Test Cases" along with test cases specially designed for the Dominion Voting Systems Democracy Suite 4.14.

- Section 3: Usability and Accessibility – The requirements in this section were tested during the Usability Test, FCA, and System Integration test utilizing a combination of the "Wyle Baseline Test Cases" and the "Wyle Baseline Usability Test Cases."

- Section 4: Hardware Requirements – The requirements in this section were tested by trained Wyle personnel per sections 4.4 of this report.

- Section 5: Software Requirements – The requirements in this section were tested during source code review, TDP review, and FCA. A combination of review and functional testing was performed to ensure these requirements were met.

- Section 6: Telecommunication – These requirements were not tested because no changes were included in this modification to the Standard Networking Configuration from the original Democracy Suite 4.0 EAC-certified system.

- Section 7: Security Requirements – The requirements in this section were tested during source code review, FCA, System Integration, and Security Tests.

3.0 TEST BACKGROUND (Continued)

3.2 Testing Scope (Continued)

- Section 8: Quality Assurance (QA) Requirements – The requirements in this section were tested throughout the test campaign via various methods. TDP review was performed on the Dominion Voting Systems QA documentation to determine compliance to EAC 2005 VVSG requirements and the requirements stated in the Dominion Voting Systems QA Program document. All source code was checked to ensure that Dominion Voting Systems followed their internal documentation process. All equipment received for initial testing and follow up testing was checked against Dominion Voting Systems documentation to ensure their QA process is being followed.

- Section 9: Configuration Management (CM) Requirements – The requirements in this section were tested throughout the test campaign. TDP review was performed on the Dominion Voting Systems configuration management documentation to determine EAC 2005 VVSG compliance and to further determine whether Dominion Voting Systems is following its documented CM requirements within the TDP. During source code review, Wyle Laboratories' qualified personnel verified that Dominion was following EAC 2005 VVSG CM requirements as well as Dominion CM requirements. All equipment received for initial testing and follow-up testing was checked against Dominion's documentation to ensure their CM process was being followed.

The Dominion Voting Systems Democracy Suite 4.14 Voting System is a paper- based precinct counting system. All EAC 2005 VVSG requirements intended for DRE were excluded from this test campaign, such as 2005 VVSG Volume 1 sections 2.3.1.3, 2.3.2, and 2.3.3.3. The following requirements were also excluded from the campaign:

- Volume I Section 6 (Telecommunication Requirements)
- Volume I Section 7.5.2-7.5.4 (Telecommunications and Data Transmission)
- Volume I Section 7.6 (Use of Public Communication Networks)
- Volume I Section 7.7 (Wireless Communications)
- Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the Democracy Suite 4.14 Voting System to the requirements contained in the indicated sections of the EAC 2005 VVSG is described in Table 3-1.

Table 3-1 Not Applicable Requirements

EAC 2005 VVSG Volume I Section	Rationale for 'Not Applicable'
6, 7.5.2-7.5.4	These requirements are written for use on public networks. The Dominion Voting Systems Democracy Suite 4.14 Voting System does not use public networks.
7.6	This section pertains to "Voting systems that transmit data over public telecommunications…" The Dominion Voting Systems Democracy Suite 4.14 as configured for this certification does not permit transmission over public networks.
7.7	No wireless technology is present in the Dominion Voting Systems Democracy Suite 4.14 Voting System.
7.9	The Dominion Voting Systems Democracy Suite 4.14 Voting System is a paper based system.

3.0 TEST BACKGROUND (Continued)

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.

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3.0 TEST BACKGROUND (Continued)

3.5 Terms and Abbreviations

Table 3-2 defines all terms and abbreviations applicable to this Test Report.

Table 3-2 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 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	---
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	---

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3.0 TEST BACKGROUND (Continued)

3.5 Terms and Abbreviations (Continued)

Table 3-2 Terms and Abbreviations (Continued)

Term	Abbreviation	Definition
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. A trusted build of the executable system is performed to ensure the certified release is built from tested components.
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	---
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 Operating Procedure	WoP	Wyle Test Method or Test Procedure.

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4.0 TEST FINDINGS AND RECOMMENDATIONS

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

4.1 Source Code Review

As part of the testing activities, the Dominion Voting Systems Democracy Suite 4.14 Voting System received a 100% source code review to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards. The manufacturer-supplied coding standards (Dominion Coding Standards) can be found within the vendor provided TDP. The review was conducted per the guideline 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 then conducted a full 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. 3, documenting that source code discrepancies found, is included in Appendix B of this report.

4.2 Witnessed Build

A Witnessed Build of the software was created using Dominion's trusted build documents. The "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 FINDINGS AND RECOMMENDATIONS (Continued)

4.2 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 "Trusted Builds" for the Dominion Democracy Suite 4.14 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 performed Witnessed Builds for each system component of the Dominion Democracy Suite 4.14 on March 20, 2013 through March 23, 2013. A Technical Representative was present via a live video feed for each of the Witnessed Builds. The outputs from the Witness Builds have been supplied to the EAC as part of the certification effort.

4.3 Technical Data Package Review

The Dominion Voting Systems Democracy Suite 4.14 Voting System Technical Data Package (TDP) was reviewed to the VVSG. This review was performed as part of the pre-testing activities. The documents included in the TDP review are listed in Section 2.5 of this document.

The TDP contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC 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 TDP documents were reviewed for accuracy, completeness, and compliance to the VVSG. The TDP documentation served as the basis for design and development of the functional tests. Functional testing also identified text in the TDP that conflicted with the actual operation of the system. These discrepancies were reported to Dominion Voting Systems and tracked as test exceptions until verified that the applicable documents had been corrected.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.3 Technical Data Package Review (Continued)

Summary Findings

The review results were recorded in a worksheet that provided the pass/fail compliance to each applicable VVSG requirement. Dominion corrected nonconformance observations and resubmitted the associated documents for review. This process continued until the TDP complied with TDP Standards.

A summary of the TDP issues encountered is provided below:

- Documents that were not included in the submitted TDP package were referenced for information
- Some descriptive information included was inconsistent with descriptions in other TDP documents
- Placeholders within the some of the documents indicated information was not yet inserted
- Not all VVSG requirements were initially addressed in some of the documents
- Some of the individual user guides included information which conflicted with the actual information, presentation, or system behavior encountered when verified during the testing process

All noted TDP issues were resolved prior to the conclusion of the review process. Notice of Anomaly No. 4, documenting that TDP discrepancies were found, is included in Appendix B of this report.

4.4 Hardware Testing

The Dominion Voting Systems Democracy Suite 4.14 is a paper-ballot based optical scan voting system. The Democracy Suite system consists of four major components: the EMS, ICE precinct scanner and ballot marking device, ICP precinct scanner, and ICC central count scanner. The Democracy Suite is comprised of two proprietary pieces of hardware (ICE and ICP) and one piece of COTS hardware (ICC). All EMS functions are handled by proprietary software running on COTS PC/laptops/servers. Wyle determined that these COTS PC/laptops/servers are not subject to hardware testing per the EAC 2005 VVSG. The provided PC/laptops/servers documented in Section 3 Materials Required For Testing all contained CE, UL, and FCC labeling.

ICP – A PCA and quick scan was performed on the ICP component to verify the changes and effects caused by the changes to the unit. No additional hardware testing was required based on the findings of the evaluation. Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the Democracy Suite 4.0 approved certification testing (EAC CERTIFICATION NUMBER – DVS-40-G). Wyle utilized the data obtained during that test effort to satisfy requirements for this modification test campaign.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-1 ICP Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Usability/3.1	Measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users	ICP	Accept	N/A
Accessibility/3.2	Tests the voting system to ensure accessibility for individuals with disabilities to include, but not limited to visually impaired voters by providing the same access and participation opportunity.	ICP	Accept	N/A
Security/7	Tests the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified.	ICP	Accept	N/A
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	ICP	Accept	N/A
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	ICP	Accept	N/A
Safety/4.3.8	UL 60950-1 product safety review	ICP	Accept	N/A
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	ICP	Accept	N/A

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-1 ICP Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	ICP	Reject	7/13/2012
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	ICP	Accept	N/A
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	ICP	Accept	N/A
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	ICP	Accept	N/A
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4 degrees F	ICP	Accept	N/A
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	ICP	Accept	N/A
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	ICP	Accept	N/A
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	ICP	Accept	N/A
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	ICP	Accept	N/A
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (1995-01)	ICP	Accept	N/A
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	ICP	Accept	N/A

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-1 ICP Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	ICP	Accept	N/A
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	ICP	Accept	N/A
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	ICP	Accept	N/A

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

ICE - A PCA and quick scan was performed on the ICE component to verify the changes and effects caused by the changes to the unit. No additional hardware testing was required based on the findings of the evaluation. Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the Democracy Suite 4.0 approved certification testing (EAC CERTIFICATION NUMBER – DVS-40-G). Wyle utilized the data obtained during that test effort to satisfy requirements for this modification test campaign.

Each unit was loaded with the Operational Status Check election definition configured for early voting. This allowed all the data generated for the Pre-operational, Operational, and Post-operational test to be further analyzed, compiled and included in the Reliability and Availability Test results.

Table 4-2 ICE Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Usability/3.1	Measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users	ICE	Reject	2/27/2013
Accessibility/3.2	Tests the voting system to ensure accessibility for individuals with disabilities to include, but not limited to visually impaired voters by providing the same access and participation opportunity.	ICE	Accept	N/A
Security/7	Tests the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified.	ICE	Reject	4/9/2013
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	ICE	Accept	N/A

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-2 ICE Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	ICE	Accept	N/A
Safety/4.3.8	UL 60950-1 product safety review	ICE	Accept	N/A
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	ICE	Accept	N/A
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	ICE	Reject	1/31/2013
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	ICE	Accept	N/A
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	ICE	Accept	N/A
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	ICE	Accept	N/A
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4 degrees F	ICE	Accept	N/A

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-2 ICE Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	ICE	Accept	N/A
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	ICE	Accept	N/A
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	ICE	Accept	N/A
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	ICE	Accept	N/A
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (1995-01)	ICE	Accept	N/A
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	ICE	Accept	N/A
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	ICE	Accept	N/A
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	ICE	Accept	N/A
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	ICE	Accept	N/A

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

ICC - ICC consists of COTS scanners and COTS Workstation PCs. The Canon DR-X10C scanners and the Dell Inspiron One 2305 and Dell OptiPlex 9010 Workstation PCs contain CE, UL, and FCC labeling. The hardware testing for the Canon DR-X10C scanners was accepted from the original Democracy Suite 4.0 (EAC CERTIFICATION NUMBER – DVS-40-G).

Table 4-3 ICC Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	ICC	Accept	N/A
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	ICC	Accept	N/A
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	ICC	Accept	N/A
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	ICC	Accept	N/A

4.5 Electrical Tests

4.5.1 Electromagnetic Radiation Test (FCC Part 15 Emissions)

Electromagnetic Radiation emissions measurements were performed in accordance with Section 4.8 of Volume II of the VVSG. This testing was performed to ensure that emissions emanating from the unit do not exceed the limits of FCC Part 15, Class B emissions. The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing.

The ICE and ICP were found to comply with the required emissions limits.

4.6 System Level Testing

System Level Testing was performed to evaluate the integrated operation of the voting system hardware and software. The suite of tests that comprise the System level Testing includes: System Integration Test, Security Test, Usability and Accessibility Tests, Data Accuracy, as well as the Physical and Functional Configuration Audits.

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

4.6.1 System Integration Test

System Integration Testing was performed to test all system hardware, software, and peripherals. System Integration Testing focused on the complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals configured as a precinct count unit as described in the Dominion Voting Systems-submitted TDP for the Democracy Suite 4.14 Voting System. To perform the System Integration Testing, Wyle developed specific procedures and test cases designed to test the system as a whole. These procedures demonstrated compliance of the Democracy Suite 4.14 Voting System to Sections 2, 3, 4, 5, and 7 of Volume I of the VVSG.

The five election definitions exercised during the System Integration Testing are listed below:

- GEN-01
- GEN-02
- GEN-03
- PRIM-01
- PRIM-03

Summary Findings

Through System Integration Testing, it was demonstrated that the system performed as documented with all components performing their intended functions. One anomaly was opened during testing which addresses the removal of Open Primary elections from the test campaign. An additional tester error occurred upon the review of the voting results. Notice of Anomaly No. 7 is included in Appendix B of this report.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 System Level Testing (Continued)

4.6.2 Security Test

The Democracy Suite 4.14 was subjected to Security Testing in accordance with the requirements of Section 7.0 of Volume I and Section 6.4 of Volume II of the VVSG. The purpose of the Security Test was to verify the tamper evident tape and seals of the newly introduced ICE Plastic Ballot Box meet the requirements of the VVSG, and to confirm the Ballot storage device is secure. All other previously certified components of the Democracy Suite 4.0 system were unmodified and therefore accepted for the current test campaign.

The Security Test was performed by running a security test suite to provide verification of the access controls and the physical controls for the ICE Plastic Ballot Box documented by Dominion.

Summary Findings

The security tie straps/tamper evident seals and their documented installation were analyzed and found to be adequate. Wyle has determined the Dominion Democracy Suite 4.14 ICE Plastic Ballot Box to be compliant with the security requirements of the EAC 2005 VVSG.

4.6.3 Usability and Accessibility Test

The Democracy Suite 4.14 Voting System was subjected to Usability and Accessibility Tests in accordance with Volume I, Section 3 of the EAC 2005 VVSG. The purpose of this testing was to assess the newly introduced ICE Plastic Ballot Box's conformance to the usability and accessibility requirements in the EAC 2005 VVSG. Conformance to these requirements should result in quality interaction between the voter and the voting system and the effectiveness with which the system provides a comfortable and efficient voting session that provides confidence to the voter that their votes are cast correctly.

The Usability and Accessibility requirements set forth by the VVSG and the Help America Vote Act (HAVA) ensure that all eligible voters are provided the ability to vote without discrimination regardless of any disabilities. As stated in the VVSG, to meet the requirements of the Usability and Accessibility Test, the voting system shall: conform to the specified usability requirements of Volume I, Section 3.1; provide the capabilities required by Volume I, Section 3.2; and, operate consistently with vendor specifications and documentation.

The requirements identified for this campaign were EAC 2005 VVSG Vol. I, Section 3.2.4a and b. The newly introduced ICE Plastic Ballot box was tested to ensure the applicable mobility requirements were met.

Summary Findings

During test performance, no issues with the ICE Plastic Ballot Box were observed.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 System Level Testing (Continued)

4.6.4 Data Accuracy Test

The Democracy Suite 4.14 Voting System was subjected to a Data Accuracy Test in accordance with the requirements of Section 4.7.1.1 of Volume II of the VVSG.

Per the EAC 2005 VVSG, data accuracy is defined in terms of ballot position error rate. This rate applies to the voting functions and supporting equipment that capture, record, store, consolidate, and report the selections (or absence thereof) made by the voter for each ballot position. To meet the requirements of this test, the voting system must be subjected to the casting of a large number of ballots to verify vote recording accuracy, i.e., at least 1,549,703 ballot positions correctly read and recorded.

ICP - The ICP successfully met the requirements of the Data Accuracy Test by scanning and processing 1,558,980 ballot positions accurately; therefore, exceeding the minimum requirement.

ICE - The Accuracy test requirements for the ICE were met by the execution of two accuracy tests. Since Wyle considers the ICE as a paper-based scanner and a ballot marker, the first accuracy test for the ICE was performed by using both paper-based and audio ballots. The majority of the vote processing was utilizing the paper-based functionality, while audio votes were being cast at defined intervals between ballot scans. After analyzing the processes and researching past testing, Wyle Laboratories believes the architecture, data flow, and integration of the recording process of an audio ballot and the scanning of a paper ballot in an ICE unit are similar and use many of the same software modules. Based on this, Wyle Laboratories has concluded that the audio feature should not be subjected to the full requirement of Volume II, Section 4.7.1.1; therefore, during test performance, 5000 audio ballot positions were cast to satisfy the execution of the feature. The remaining ballot positions were captured with paper-based voting. All results were validated and verified against the election definition voting matrix for expected results. The ICE processed the minimum number of ballot positions without error and the test was accepted.

The second accuracy test consisted of the ICE Ballot Marking Device (BMD). Wyle utilized a maximum position ballot with the ICE, which was manually voted in order to verify the components correctly tabulated at least 1,549,703 ballot positions within the allowable target error rate. All three units under test utilized the ATI to input the vote selections. All results were validated and verified against the election definition voting matrix for expected results. The ICE processed the minimum number of ballot positions, during both tests, without error and the test were accepted.

ICC - The ICC accuracy test was exercised by using only paper-based ballots. All results were validated and verified against the election definition voting matrix for expected results. The ICC processed the minimum number of ballot positions without error and the test was accepted.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 System Level Testing (Continued)

4.6.4 Data Accuracy Test (Continued)

Table 4-4 Democracy Suite 4.14 Accuracy ICE and ICP

Ballot Size	No. of Ballots	No. Vendor Marked	No. Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	X Voted=	Total
11 inch	50	15	35	198	3	6	178,200
14 inch	50	15	35	270	3	6	243,000
17 inch	50	15	35	342	3	6	307,800
20 inch	50	15	35	414	3	6	372,600
22 inch	55	20	35	462	3	6	457,380
Total	**255**	**80**	**175**	**N/A**	**N/A**	**30**	**1,558,980**

Table 4-5 Democracy Suite 4.14 Accuracy ICC

Ballot Size	No. of Ballots	No. Vendor Marked	No. Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	X Voted=	Total
11 inch	50	15	35	198	2	9	178,200
14 inch	50	15	35	270	2	9	243,000
17 inch	50	15	35	342	2	9	307,800
20 inch	50	15	35	414	2	9	372,600
22 inch	55	20	35	462	2	9	457,380
Total	**255**	**80**	**175**	**N/A**	**N/A**	**45**	**1,558,980**

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 System Level Testing (Continued)

4.6.4 Data Accuracy Test (Continued)

Summary Findings

The Democracy Suite 4.14 Voting System successfully met the requirements of the Data Accuracy Test by scanning and processing at least 1,549,703 ballot positions without error.

4.6.5 Physical Configuration Audit

A Physical Configuration Audit (PCA) of the Democracy Suite 4.14 Voting System was performed as part of the pre-testing activities 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 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,
- Verifying 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,
- Reviewing drawings, specifications, technical data, and test data associated with system hardware, and to establish system baseline,
- Reviewing 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,
- 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

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

- The Democracy Suite Election Management System (EMS) software platform
- The Democracy Suite ImageCast Precinct (ICP) Precinct Count Optical Scanner
- ImageCast Evolution (ICE) Precinct Count Optical Scanner with optional ballot marking capabilities
- The Democracy Suite ImageCast Central (ICC) Optical Central Count High Speed Scanner
- All accessories, equipment and documentation used with the Democracy Suite 4.14 Voting System

Summary Findings

A focused PCA was performed to baseline the system's hardware and software components prior to commencement of the test campaign. No discrepancies were noted during the PCA.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 System Level Testing (Continued)

4.6.6 Functional Configuration Audit (FCA)

The functional configuration audit encompasses an examination of manufacturer's tests, and the conduct of additional tests, to verify that the system hardware and software perform all the functions described in the manufacturer's documentation submitted for the TDP. In addition to functioning according to the manufacturer's documentation, tests were conducted to ensure all applicable EAC 2005 VVSG requirements are met.

A Functional Configuration Audit (FCA) of the Dominion Democracy Suite 4.14 was performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify that the Democracy 4.14 performs as documented in the Dominion-supplied technical documentation during pre-voting, voting, and post-voting activities and validate that the Democracy 4.14 meets the requirements of the EAC 2005 VVSG. To perform the FCA, the Democracy 4.14 was subjected to a series of tests to simulate pre-voting, voting, and post-voting activities. These tests were performed to ensure compatibility of voting machine functions at the precinct level using the referenced firmware. During the FCA, both normal and abnormal data was input into the system to attempt to introduce errors and test for error recovery. The activities simulated were:

- Verification of hardware status via diagnostic reports prior to election
- Performing procedures required to prepare hardware for election operations
- Obtaining 'zero' machine report printouts on all contest fields
- Performing procedures to open the polling place and enable ballot counting
- Casting of ballots to demonstrate proper processing, error handling, and generation of audit data
- Performing hardware operations required to disable ballot counting and closing the polls
- Obtaining machine reports and verifying correctness
- Obtaining machine-generated audit logs and verifying correctness

The FCA was divided into three phases: pre-voting, voting, and post-voting. The three phases are described in greater detail in steps (1) through (3).

1. Pre-Voting

   Pre-Voting encompasses all activities performed to the point of loading the election data on a transport media. These activities include verifying roles, user administration, database administration, defining the political subdivisions, defining election types, defining voting variations, defining the ballot contents, audio ballot definition, election definition loading, auditing election creation process, producing pre- election reports, adding to existing elections, updating existing elections, modifying ballot styles, verifying alternative language translations, and loading an election on precinct count devices.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 System Level Testing (Continued)

4.6.6 Functional Configuration Audit (FCA) (Continued)

2. Voting

Voting encompasses all activities performed by poll workers, voters, and warehouse maintenance technicians after an election has been loaded, through the processing of special votes such as absentee and provisional ballots.

These activities include pre-election logic testing, diagnostic tests, opening the polls, activating ballots, voting and casting both normal and audio ballots, utilizing the usability and accessibility aspects of the accessible voting station, closing the polls, printing machine reports, performing post-election maintenance tasks, and executing special voting sessions such as the processing of absentee and provisional ballots.

3. Post-Voting

Post-Voting encompasses all activities performed from verification of machine reports to the EMS post-election activities. These activities include verifying election results, tabulation of results, consolidating voted data, Transport Media (TM) maintenance & cleaning, Transport Media logs, concluding an election, backing up results, retaining test data for 22 months, deleting elections, and auditing voting machine log.

Summary Findings

A Functional Configuration Audit was performed to ensure the system functions and operates as described within the system's technical documentation. A Notice of Anomaly was created to cover all discrepancies notated during the FCA. Further detail is located within Appendix D of this report. A total of 26 discrepancies were identified and corrected prior to the conclusion of the test campaign.

4.6.7 Availability

The voting system achieved at least 99 percent availability during normal operation for the applicable functions of the system.

4.7 Anomalies and Resolutions

Wyle performed compliance testing of the Dominion Voting Systems Democracy Suite 4.14 Voting System to the EAC 2005 VVSG. During the test campaign, all data from all "pre-testing", hardware testing, software testing, functional testing, security testing, volume testing, stress testing, usability testing, accessibility testing, and reliability testing activities was combined to ensure all applicable EAC 2005 VVSG requirements that are supported by the Democracy Suite 4.14 Voting System had been tested.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.7 Anomalies and Resolutions (Continued)

A total of eight 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 B of this report and are summarized below along with their resolution.

Notice of Anomaly No. 1: ICP Audio Tester Error: Two voting errors were discovered upon review of the voting result printouts for the ICP Audio Accuracy test. Each tester is provided an engineering notebook or tester log for the unit under test to document any issues or abnormalities noticed during testing. The tester logs were reviewed and no voting anomalies were annotated by the testers during execution of the test. Based on the additional units under test with the same elections and no issues during previous testing Wyle determined this to be an isolated instance of tester error. To ensure accuracy and confidence within the ICP unit an additional measure was implemented by Wyle to provide a voting log in order to facilitate a second confirmation that the intended candidate was selected for each voting contest. The test was restarted utilizing the new log to ensure any anomalies were logged accurately at the time of occurrence. The results of the second test indicated that all contests were accurately voted.

Notice of Anomaly No. 2: PhotoScribe Scanner: The Temperature and Power Variation test included 2 PhotoScribe PS900 scanners. The Pre-Operational Status checks were successfully completed on both units prior to starting the test. After the temperature of the chamber was lowered to 50 degree Fahrenheit, the first test deck was scanned on each unit in which 60 percent of the ballots were out-stacked as unreadable. At that time the test was halted and Dominion was notified of the issue. Electronic logs were then provided to Dominion for troubleshooting. After reviewing the logs, Dominion notified Wyle that the PhotoScribe units will be removed from the current Democracy Suite 4.14 test campaign.

Notice of Anomaly No. 3: Source Code: Review of the submitted source code comprising the Democracy Suite Version 4.14 Voting System revealed deviations from the standard as well as issues with the commenting. 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. Dominion Voting Systems 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.

Notice of Anomaly No. 4: Technical Data Package (TDP) Review: Review of the submitted documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Functional testing also identified text in the TDP that conflicted with the actual operation of the system. Each noted discrepancy was documented in detail in the Wyle-generated TDP review reports on file as raw data.

Notice of Anomaly No. 5: ICE BMD: During the Accuracy for ICE BMD test, the LCD touchscreen became frozen. Dominion was provided with the contents of the CF cards, and determined the issue to be related to a portion of guard code (code that checks bounds, arrays, resolves deadlocks, etc.) that was thought to be unnecessary and thus removed. As a result of this test anomaly, the code was added back in by Dominion, a Compliance Build was performed at Wyle, and the test was repeated without issues.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.7 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 6: ICE Audio: During the Accuracy test for ICE Audio, the following message was displayed on two of the three units under test after applying the key fob to the unit: "E170100 An unexpected error condition has occurred. Device error- Printer not ready (A possible reason for this error is that the ballot printer cartridge is missing)." The contents of the CF0 and CF1 cards were provided to Dominion who determined that the issue was related to a memory allocation conflict within the ICE firmware. Dominion re-submitted the ICE firmware with the correction, and Wyle performed a Compliance Build. Afterwards, the test was restarted and completed successfully.

Notice of Anomaly No. 7: System Integration: Two separate, unrelated administrative issues were identified during the execution of System Integration. (1) Actual voting results from Open Primary election Prim-01 did not match expected results for the ICC tabulator. For the ballots in question, the expected outcome was that no candidate should receive a vote due to the cross-over selections. Instead, all candidates presented on the ballots received a vote. After further discussion with Dominion, it was determined that the Open Primary election format is not fully supported for the DVS 4.14 system, therefore, Open Primary was removed from the declared functionality. (2) A voting error was discovered upon review of the voting results printouts for the System Integration Test for the ICP audio tabulator. Engineering Notebooks or tester logs were reviewed and no voting anomalies were annotated by the tester. Based on the additional units under test and engineering analysis from previous testing Wyle determined this to be an isolated instance of tester error. To ensure accuracy and confidence within the ICP unit an additional measure was implemented by Wyle to provide a voting log in order to facilitate a second confirmation that the intended candidate was selected for each voting contest. This resulted in a successful repeat of the test for the ICP tabulator. In addition to repeating the test, Wyle performed an internal test by casting a series of additional set of audio ballots on the ICP to further ensure the accuracy of voting audio ballots on the ICP tabulator. Results of this indicated all votes were accurately counted.

Notice of Anomaly No. 8: Functional Configuration Audit: System functional issues were noted during the execution of FCA, Accuracy testing, System Integration testing, usability testing, Security testing, or were noted during the general test campaign and not linked to a specific test or VVSG requirement. All deficiencies noted in Appendix D of this report were resolved prior to the conclusion of the test campaign.

4.8 Deficiencies and Resolutions

Deficiencies were discovered during the testing campaign as part of the FCA, Hardware Testing, System Integration, Usability, and Accuracy Testing. In addition, deficiencies that were not linked to a specific test or VVSG requirement were noted during the general test campaign. All deficiencies noted were corrected prior to the conclusion of the test campaign. The deficiencies are listed in Appendix D of this document.

4.9 Recommendation for Certification

Wyle performed conformance/specification testing on the Dominion Voting Systems Democracy Suite 4.14 to the EAC 2005 VVSG (Version 1.0). During the test campaign, all data from pre-testing, hardware testing, software testing, functional testing, security testing, usability testing, accessibility testing, and reliability testing activities was combined to ensure all VVSG requirements that are supported by the Democracy Suite 4.14 had been tested. Wyle also used discretion as granted by the VVSG to design and exercise FCA Test Cases, perform source code reviews, and perform Security Tests.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.9 Recommendation for Certification (Continued)

Wyle concludes that the Democracy Suite 4.14, 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 well as passes all additional tests performed at Wyle's discretion. As such, Wyle recommends that the EAC grant the Dominion Voting Systems Democracy Suite 4.14, certification to the VVSG.

This report is valid only for the system identified in Section 2 of this 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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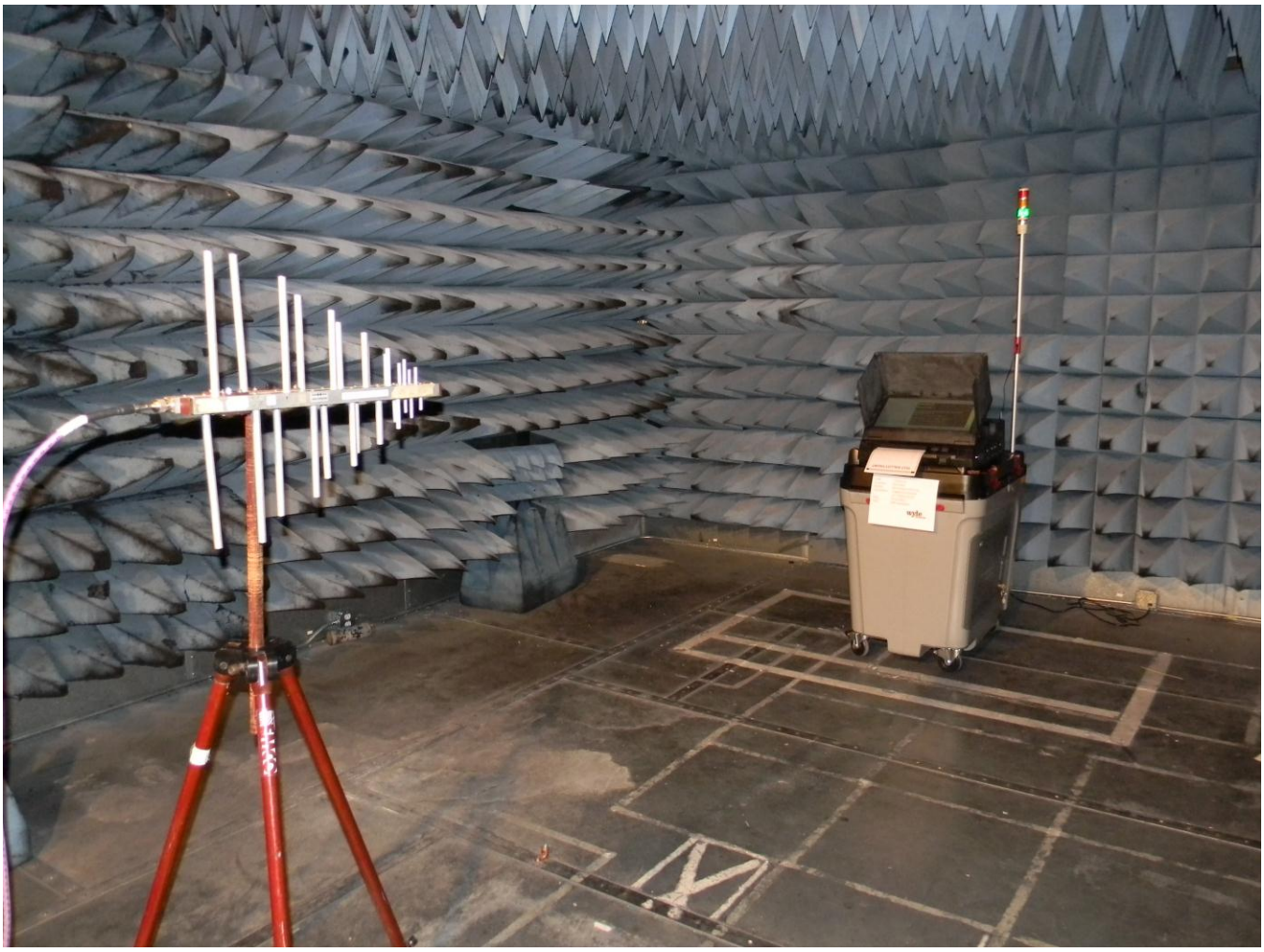
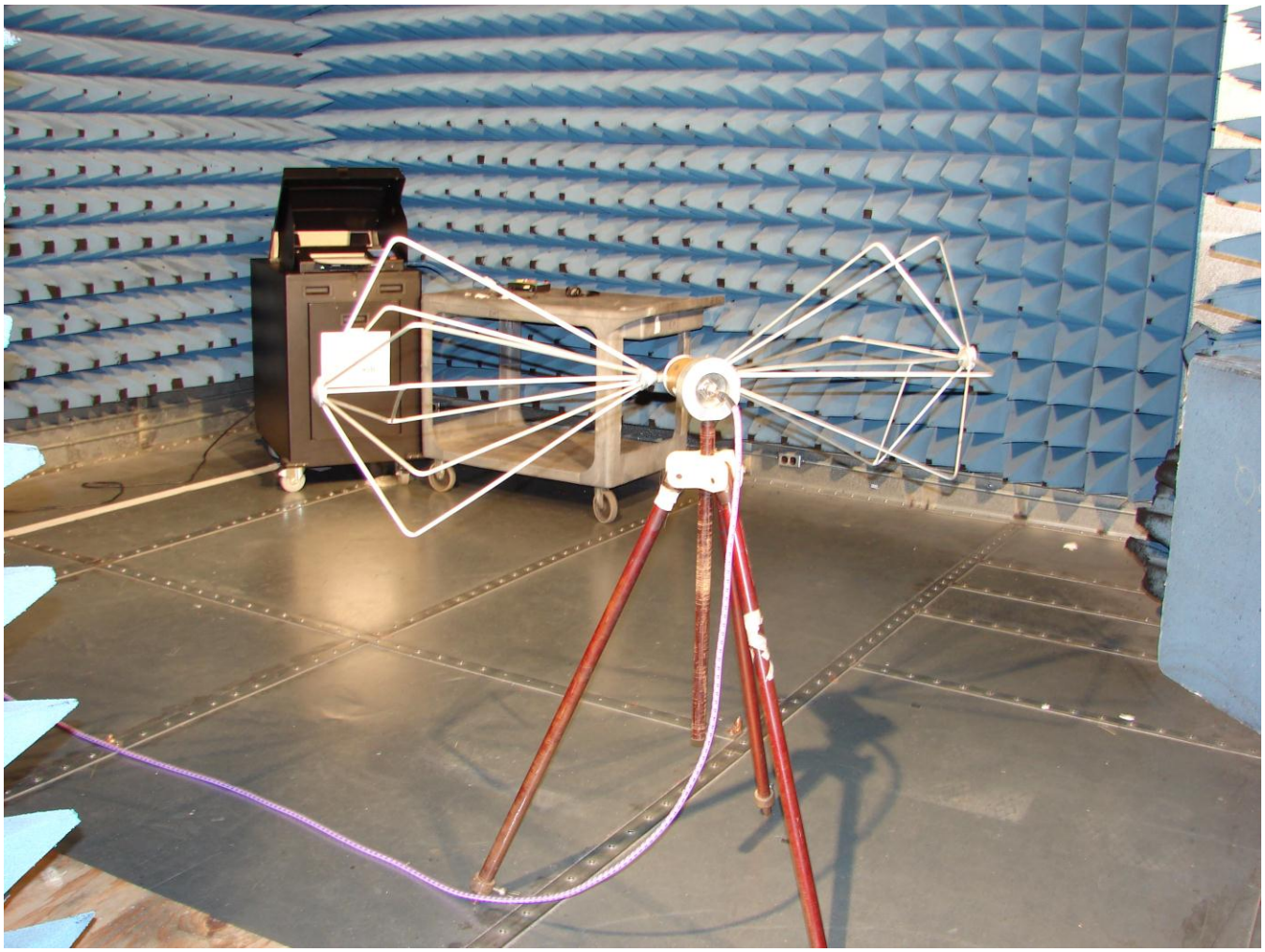
APPENDIX A

PHOTOGRAPHS



Photograph 1
ICE Electromagnetic Radiation Test Setup



Photograph 2
ICP Electromagnetic Radiation Test Setup

Photograph 3
ICE Plastic Ballot Box Usability Testing

Photograph 4
ICP Audio Accuracy Test Setup

Photograph 5
ICE BMD Accuracy Test Setup

Photograph 6
ICE Audio Accuracy Test Setup

Photograph 7
ICP Accuracy Test Setup

Photograph 8
ICE Accuracy Test Setup

Photograph 9
ICC Accuracy Test Setup

Photograph 10
ICP System Integration Test Setup

Photograph 11
ICE System Integration Test Setup

Photograph 12
ICC System Integration Test Setup

APPENDIX B

NOTICES OF ANOMALY NOS. 1 THROUGH 8

The Notices of Anomaly are documented when the anomalies are first discovered; Thus, final disposition of anomalies may not be recorded within the NOA document. Please refer to section 4.7 of the Test Report for a full description of the disposition.

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ORIGINAL

NOTICE OF ANOMALY

DATE: 03/20/2013

NOTICE NO: 1 P.O. NUMBER: PO0005146 CONTRACT NO: N/A

CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01

NOTIFICATION MADE TO: Ed Smith NOTIFICATION DATE: 03/20/2013

NOTIFICATION MADE BY: Jon Stevenson VIA: In Person

CATEGORY: [ ] SPECIMEN [x] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 03/20/2013

PART NAME: Audio Tactile Interface PART NO.

TEST: Accuracy Test for ICP Audio I.D. NO.

SPECIFICATION: 2005 VVSG Vol I PARA. NO. Section 4.1.1

REQUIREMENTS:

4.1.1 Accuracy Requirements

Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data. This rate is set at a sufficiently stringent level that the likelihood of voting system errors affecting the outcome of an election is exceptionally remote even in the closest of elections.

DESCRIPTION OF ANOMALY:

Two voting errors were discovered upon review of the voting results printouts for the ICP Audio Accuracy test. Test logs were reviewed and no voting anamolies were annotated by the testers.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

Develop a voting log to provide to each tester in order to facilitate a second confirmation that the intended candidate was selected for each voting contest. Restart test utilizing new log to ensure any anomalies are logged accurately at the time of occurrence.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING:

QUALITY ASSURANCE: 5/20/2013

PROJECT ENGINEER: Jon Stevenson 5/29/13

PROJECT MANAGER: Frank Padilla 5/20/13

INTERDEPARTMENTAL COORDINATION:

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ORIGINAL

NOTICE OF ANOMALY

DATE: 04/03/2013

NOTICE NO: 2 P.O. NUMBER: PO0005146 CONTRACT NO: N/A
CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01
NOTIFICATION MADE TO: Ed Smith NOTIFICATION DATE: 03/26/2013
NOTIFICATION MADE BY: Michael Walker VIA: E-mail

CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 03/26/2013
PART NAME: PhotoScribe PS900 Scanner PART NO. 9002547-25, 9002790-26
TEST: Temperature and Power Variation I.D. NO.
SPECIFICATION: 2005 VVSG Vol II PARA. NO. Section 4.7.1

REQUIREMENTS:

4.7.1 Temperature and Power Variation Tests
This test is similar to the low temperature and high temperature tests of MIL-STD-810-D, Method 502.2 and Method 501.2, with test conditions that correspond to the requirements of the performance standards. This procedure tests system operation under various environmental conditions for at least 163 hours. During 48 hours of this operating time, the device shall be in a test chamber. For the remaining hours, the equipment shall be operated at room temperature. The system shall be powered for the entire period of this test; the power may be disconnected only if necessary for removal of the system from the test chamber.

Operation shall consist of ballot-counting cycles, which vary with system type. An output report need not be generated after each counting cycle. The interval between reports, however, should be no more than 4 hours to keep to a practical minimum the time between the occurrence of a failure or data error and its detection.

DESCRIPTION OF ANOMALY:

The Temperature and Power Variation test included 2 PhotoScribe PS900 scanners. The Pre-Operational Status checks were successfully completed on both units prior to starting the test. After the temperature of the chamber was lowered to 50 degree Fahrenheit, the first test deck was scanned on each unit in which 60 percent of the ballots were outstacked as unreadable. At that time the test was halted and Dominion was notified of the issue. Electronic logs were then provided to Dominion for troubleshooting.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

Dominion notified Wyle that the PhotoScribe units will be removed from the current Democracy Suite 4.14 test campaign.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☒ NO ☐ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:
TEST WITNESS: N/A
REPRESENTING:
QUALITY ASSURANCE: 5/29/2013

PROJECT ENGINEER: Jon Stevenson 5/29/13
PROJECT MANAGER: Frank Padilla 5/29/13
INTERDEPARTMENTAL COORDINATION:

WH 1066, Rev. March '09

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ORIGINAL

NOTICE OF ANOMALY

DATE: 04/05/2013

NOTICE NO: 3 P.O. NUMBER: PO0005146 CONTRACT NO: N/A

CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01

NOTIFICATION MADE TO: Reed Bodwell NOTIFICATION DATE: 04/05/2013

NOTIFICATION MADE BY: Jon Stevenson VIA: E-mail

CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 08/27/2012 – 05/24/2013

PART NAME: Democracy Suite 4.14 PART NO. --

TEST: Source Code Review I.D. NO. Wyle Review Summaries

SPECIFICATION: EAC 2005 VVSG Vol I PARA. NO. Section 5

REQUIREMENTS:

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 m odules comprising the Democracy Suite 4.14 System revealed deviations from the standard as well as issues with the commenting. 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 Voting Systems for resolution. Dominion Voting Systems 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.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☒ NO ☐ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING: N/A

QUALITY ASSURANCE: Michael Cooper 5/29/2013

PROJECT ENGINEER: Jon Stevenson 5/29/13

PROJECT MANAGER: Frank Padilla 5/29/13

INTERDEPARTMENTAL COORDINATION:

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ORIGINAL

NOTICE OF ANOMALY

DATE: 04/05/2013

NOTICE NO: 4 P.O. NUMBER: PO0005146 CONTRACT NO: N/A

CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01

NOTIFICATION MADE TO: Devan Vanden Boomen NOTIFICATION DATE: 04/05/2013

NOTIFICATION MADE BY: Alan Simmons VIA: E-mail

CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 08/27/2012–05/24/2013

PART NAME: Democracy Suite 4.14 PART NO. --

TEST: TDP Review I.D. NO. --

SPECIFICATION: EAC 2005 VVSG Vol I PARA. NO. Section 2

REQUIREMENTS:

The Dominion Voting Systems Democracy Suite 4.14 System Techinical Data Package (TDP) shall be reviewed for accuracy, completeness, and compliance to the EAC 2005 VVSG.

DESCRIPTION OF ANOMALY:

Review of the submitted documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Functional testing also identified text in the TDP that conflicted with the actual operation of the system. Each noted discrepancy was documented in detail in the Wyle-generated TDP review reports on file as raw data.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

The review results were recorded in a worksheet that provided the pass/fail compliance in each applicable EAC 2005 VVSG requirement. Dominion Voting Systems corrected each nonconformance observation and resubmitted the associated documents for review. This process continued until the TDP complied with all applicable requirements.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING:

QUALITY ASSURANCE: 5/29/13

PROJECT ENGINEER: Jon Stevenson 5/29/13

PROJECT MANAGER: Frank Padilla 5/29/13

INTERDEPARTMENTAL COORDINATION:

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ORIGINAL

NOTICE OF ANOMALY

DATE: 04/03/2013

NOTICE NO: 5 P.O. NUMBER: PO0005146 CONTRACT NO: N/A
CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01
NOTIFICATION MADE TO: Ed Smith NOTIFICATION DATE: 03/25/2013
NOTIFICATION MADE BY: Frank Padilla VIA: E-mail

CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 03/25/2013
PART NAME: ImageCast Evolution PART NO.
TEST: Accuracy Test for ICE BMD I.D. NO.
SPECIFICATION: 2005 VVSG Vol I PARA. NO. Section 4.1.1

REQUIREMENTS:

4.1.1 Accuracy Requirements
Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data. This rate is set at a sufficiently stringent level that the likelihood of voting system errors affecting the outcome of an election is exceptionally remote even in the closest of elections.

DESCRIPTION OF ANOMALY:

The ICE unit became unresponsive while voting an accessible ballot utilizing the Audio Tactile Interface. The firmware version was 4.14.7, and the issue occurred while voting ballot 41 of 105.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

Provide the contents of the CF cards to Dominion for further analysis.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:
TEST WITNESS: N/A
REPRESENTING:
QUALITY ASSURANCE: 5/29/2013

PROJECT ENGINEER: Jon Stevenson 5/29/13
PROJECT MANAGER: Frank Padilla 5/28/13
INTERDEPARTMENTAL COORDINATION:

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ORIGINAL

NOTICE OF ANOMALY

DATE: 04/03/2013

NOTICE NO: 6 P.O. NUMBER: PO0005146 CONTRACT NO: N/A

CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01

NOTIFICATION MADE TO: Ed Smith NOTIFICATION DATE: 04/02/2013

NOTIFICATION MADE BY: Michael Walker VIA: E-mail

CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 04/02/2013

PART NAME: ImageCast Evolution PART NO.

TEST: Accuracy Test for ICE Audio I.D. NO.

SPECIFICATION: 2005 VVSG Vol I PARA. NO. Section 4.1.1

REQUIREMENTS:

4.1.1 Accuracy Requirements

Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data. This rate is set at a sufficiently stringent level that the likelihood of voting system errors affecting the outcome of an election is exceptionally remote even in the closest of elections.

DESCRIPTION OF ANOMALY:

The ICE unit became unresponsive while voting an audio ballot during the Accuracy for ICE Audio test utilizing firmware version 4.14.7.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

Provide the contents of the CF cards to Dominion for further analysis, and request an update to the Technical Data Package related to the error.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☒ NO ☐ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING:

QUALITY ASSURANCE: 5/29/13

PROJECT ENGINEER: Jon Stevenson 5/29/13

PROJECT MANAGER: Frank Padilla 5/29/13

INTERDEPARTMENTAL COORDINATION:

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ORIGINAL

NOTICE OF ANOMALY

DATE: 05/16/2013

NOTICE NO: 7 P.O. NUMBER: PO0005146 CONTRACT NO: N/A

CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01

NOTIFICATION MADE TO: Ed Smith NOTIFICATION DATE: 05/16/2013

NOTIFICATION MADE BY: Michael Walker VIA: E-mail

CATEGORY: [ ] SPECIMEN [x] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 05/16/2013

PART NAME: ImageCast Precinct and ImageCast Central PART NO. ---

TEST: System Integraton I.D. NO. ---

SPECIFICATION: 2005 VVSG Vol II PARA. NO. Section 6

REQUIREMENTS:

6.1 System Integration Testing
System level certification tests address the integrated operation of both hardware and software, along with any telecommunications capabilities. The system level certification tests shall include the tests (functionality, volume, stress, usability, security, performance, and recovery) indicated in the National Certification Test Plan, described in Appendix A. These tests assess the system's response to a range of both normal and abnormal conditions initiated in an attempt to compromise the system. These tests may be part of the audit of the system's functional attributes, or may be conducted separately.

DESCRIPTION OF ANOMALY:

1. Voting results from Open Primary election did not match expected results for the ImageCast Central tabulator.

2. A voting error was discovered upon review of the voting results printouts for the System Integration Test for the ICP audio tabulator. Test logs were reviewed and no voting anamolies were annotated by the tester.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

1. Request further clarification from Dominion Voting of Open Primary election support in the EAC 4.14 system.

2. Provide additional training to resources responsible for voting audio ballots on the ICP. Also, introduce an additional step in the process of having the voter verify selections, then restart this portion of the System Integration test.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☒ NO ☐ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

PROJECT ENGINEER: Jon Stevenson 5/29/13

TEST WITNESS: N/A

PROJECT MANAGER: Frank Padilla 5/29/13

REPRESENTING:

INTERDEPARTMENTAL COORDINATION:

QUALITY ASSURANCE: 5/29/13

WH 1066, Rev. March '09

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wyle laboratories

ORIGINAL

NOTICE OF ANOMALY

DATE: 02/15/2013

NOTICE NO: 8 P.O. NUMBER: PO0005146 CONTRACT NO: N/A

CUSTOMER: Dominion Voting Systems WYLE JOB NO: T70251.01

NOTIFICATION MADE TO: Ed Smith NOTIFICATION DATE: 02/15/2013

NOTIFICATION MADE BY: Jon Stevenson VIA: E-mail

CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 02/15/2013 – 03/15/2013

PART NAME: Election Management System (EMS) PART NO. v. 4.14

TEST: Functional Configuration Audit (FCA) I.D. NO. --

SPECIFICATION: EAC 2005 VVSG Vol II PARA. NO. Section 6.7

REQUIREMENTS:

A Functional Configuration Audit (FCA) of the EMS v4.14 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 EMS v4.14 performs as documented in the Domion-supplied technical documentation during the Democracy Suite 4.14 test campaign.

DESCRIPTION OF ANOMALY:

During performance of the FCA, issues were noted related to system functionality.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

A report of all identified issues was sent to Dominion for resolution. Dominion then corrected all noted issues and the tests were repeated with no anomalies.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☒ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING:

QUALITY ASSURANCE: 5/29/13

PROJECT ENGINEER: Jon Stevenson 5/29/13

PROJECT MANAGER: Frank Padilla 5/29/13

INTERDEPARTMENTAL COORDINATION:

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APPENDIX C

TEST PLAN – AS RUN

CERTIFICATION TEST PLAN

Prepared for:

Manufacturer Name	Dominion Voting Systems
Manufacturer System	Democracy Suite Version 4.14
EAC Application No.	**DVS1201**
Manufacturer Address	215 Spadina Avenue, Suite 200 Toronto, Ontario, Canada

wyle laboratories			**REPORT NO.** Test Plan T70251.01-01, Rev. B **DATE** June 3, 2013
REV	DATE	PAGE OR PARAGRAPH AFFECTED	DESCRIPTION OF CHANGES
---	1-10-13	Entire Document	Original Release
A	1-30-13	Section 3.1, Page 22	Removed blank rows from table
A	1-30-13	Section 4.4.1, Page 41	Reworded section for better description of COTS
A	1-30-13	Section 4.4.2, Page 41	Fixed spacing issue in paragraph
A	1-30-13	Section 4.5, Page 43	Removed reference to automated source code review
A	1-30-13	Section 4.7, Page 45	Changed from pre-testing to testing activities
A	1-30-13	Section 4.8, Page 46	Removed reference to ISO 9001
A	1-30-13	Section 6.3.2, Page 57	Removed reference to automated source code review
A	1-30-13	Section 6.3.2, Page 55	Updated verbiage to include reference for TDP location of the software design and specification documents
A	2-4-13	Section 2.1, Page 14	Updated verbiage to included reference to tables located in section 4.4.1 for further description
A	2-4-13	Section 4.1, Page 33	Updated verbiage removing requirements and replacing with Wyle Test Cases and WoP's
A	2-4-13	Section 4.4.1, Pages 37&38	Updated verbiage to include better description for PCA and Quick scan being performed
A	2-4-13	Section 1.3, Page 2	Updated abbreviation for ATI to include the same unit is utilized for both the ICP and ICE
A	2-4-13	Section 4.7, Page 45	Updated section to include 100% peer review on issues within code on initial pass
B	6-3-13	Entire Document	Updated to "As Run" Test Plan for Final Report

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APPENDICES

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1.0 INTRODUCTION

The purpose of this National Certification Test Plan (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 System, 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 Voting Systems submitted an application to the EAC for certification of the Democracy Suite 4.14 System to the requirements of the EAC 2005 VVSG.

1.1 Scope

The purpose of this modification is to introduce the upgrade from the Democracy Suite 4.0 to the Democracy Suite 4.14 system. The system modification will include both hardware and software upgrades from the previously certified system, as well as the introduction of new hardware:

5. Election Management System (EMS) – Software upgrades
6. ImageCast Evolution (ICE) – Hardware and software upgrades, and introduction of plastic ballot box
7. ImageCast Precinct (ICP) – Hardware and software upgrades
8. ImageCast Central (ICC) – Software upgrades, and introduction of an additional scanner

Preliminary EMI Quick Scans were performed on the ICE and ICP tabulators for comparison to the baseline emissions noted during the prior test campaign. The outcome revealed improved emission levels for both tabulators, which resulted in the acceptance of previous hardware tests as noted in tables 4-2 and 4-3.

The complete system shall be tested in a full system integration test to ensure all components interact properly in the current system configurations listed in the Dominion 4.14 Voting System scope.

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
- 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

1.0 INTRODUCTION (Continued)

1.2 References (Continued)

- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' Test Guidelines for Performing Electromagnetic Interference (EMI) Testing", and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- Wyle Laboratories' Quality Assurance Program Manual, Revision 4
- 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)
- EAC Notices of Clarification (listed on www.eac.gov)
- EAC Quality Monitoring Program residing on:

  http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx

A listing of the Democracy Suite 4.14 System Technical Data Package (TDP) Documents submitted for this certification test effort is listed in Section 3.4: Deliverable Materials.

1.3 Terms and Abbreviations

This subsection defines all terms and abbreviations applicable to the development of this Test Plan.

Table 1-1 Terms and Abbreviations

Term	Abbreviation	Definition
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.
EMS 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 or software

1.0 INTRODUCTION (Continued)

1.3 Terms and Abbreviations (Continued)

Direct Record Electronic	DRE	---
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	The Election Management System equivalent for the Democracy Suite System.
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.
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. A trusted build of the executable system is performed to ensure the certified release is built from tested components.
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 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	---

1.0 INTRODUCTION (Continued)

1.3 Terms and Abbreviations (Continued)

Table 1-1 Terms and Abbreviations (Continued)

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 Test Method or Test Procedure.

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 to be qualified to perform the testing.

1.4.1 Project Schedule

This information is contained in a Wyle-generated Microsoft Project schedule. This schedule is presented in Appendix A "Dominion Voting Systems Project Schedule". The dates on the schedule are not firm dates but planned estimates presented for informational purposes.

1.4.1.1 Owner Assignments

This information is contained in a Wyle generated Microsoft Project schedule. This schedule is presented in Appendix A "Dominion Voting Systems Project Schedule".

1.4.1.2 Test Case Development

Wyle will utilize the "Wyle Baseline Test Cases" for the Functional Configuration Audit (FCA), Usability and System Integration Tests. These will be augmented with specially designed test cases tailored to the Dominion Voting Systems Democracy Suite 4.14. Wyle has designed specific election definitions for the Operational Status Check and Accuracy Tests.

1.4.1.3 Test Procedure Development and Validation

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

1.4.1.4 Third-Party Testing

Wyle will not utilize any 3rd party testing during performance of the Dominion Democracy Suite 4.14 System test campaign.

1.4.1.5 EAC and Manufacturer Dependencies

This information is contained in a Wyle generated Microsoft Project schedule. This schedule is presented in Appendix A "Dominion Voting Systems Project Schedule".

1.5 Target of Evaluation Description

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

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview

The Dominion Voting Systems Democracy Suite 4.14 System is a paper-based optical scan voting system. The Democracy Suite 4.14 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 Dominion Voting Systems Democracy Suite 4.14 EMS consists of seven components running as either a front-end/client application or as a back-end/server application. Below is a list and brief description of each.

- Democracy Suite 4.14 EMS Election Event Designer client application - integrates election definition functionality and represents a main pre-voting phase end-user application.
- Democracy Suite 4.14 EMS 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.
- Democracy Suite 4.14 EMS 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.
- Democracy Suite 4.14 EMS Data Center Manager client application - represents a system level configuration application used in EMS back-end data center configuration.
- Democracy Suite 4.14 EMS 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.
- Democracy Suite 4.14 EMS 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.
- Democracy Suite 4.14 EMS 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.

Precinct Ballot Tabulator: ImageCast Evolution (ICE)

The ICE Ballot Counter device is a precinct-level, optical scan, ballot counter (tabulator) designed to perform six major functions**:**

- Ballot scanning
- Tabulation
- Ballot review
- Second chance voting
- Accessible voting
- Ballot marking

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview (Continued)

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 an external plastic ballot box. 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.

Photograph 1: ImageCast Evolution (ICE)

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)

1.0 INTRODUCTION (Continued)

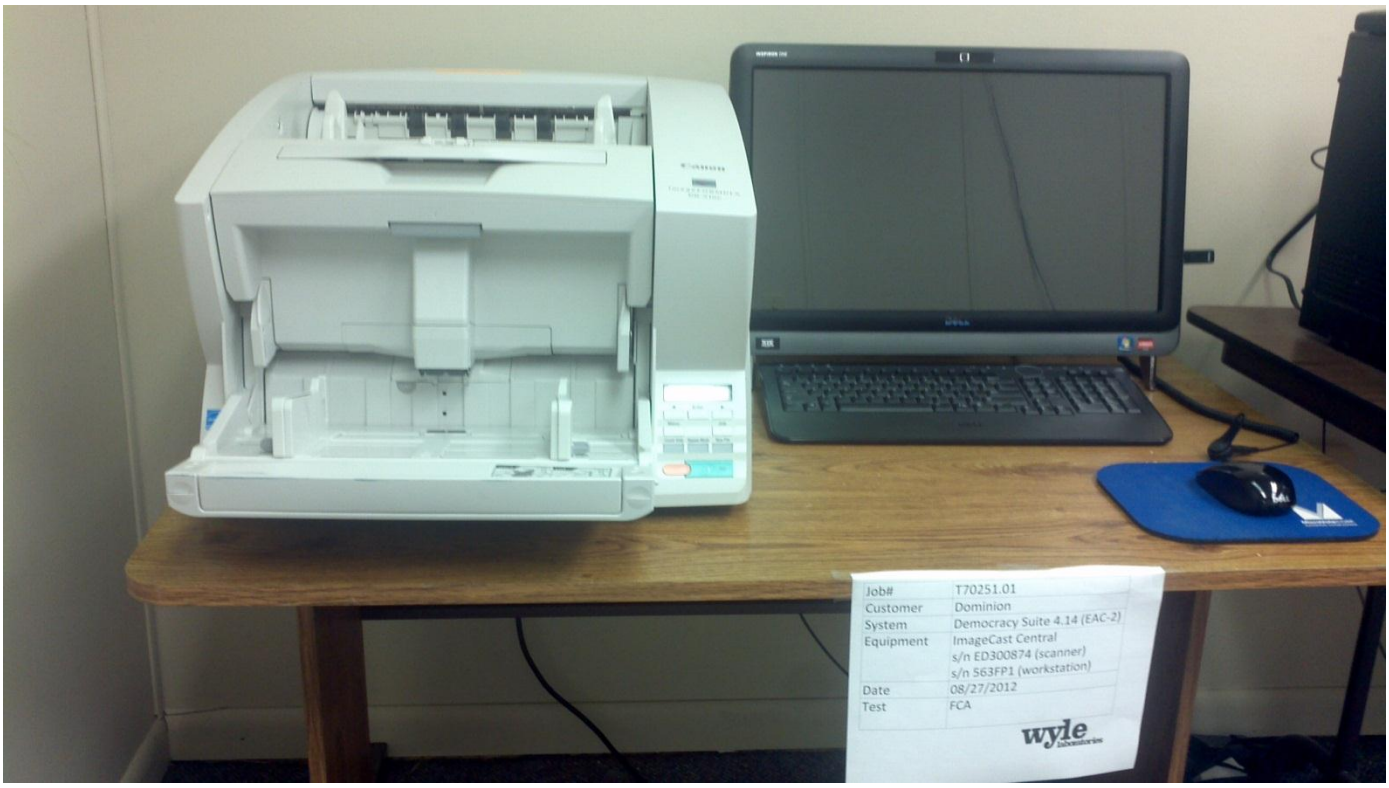
1.5 Target of Evaluation Description (Continued)

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 used for ballot image and election rules processing and results transfer to the EMS Datacenter. The ImageCast Central Workstation is hardware which executes the image processing and election rules software application.
- 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

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.2 Block Diagram

The entire system diagram is presented in Figure 1-1.

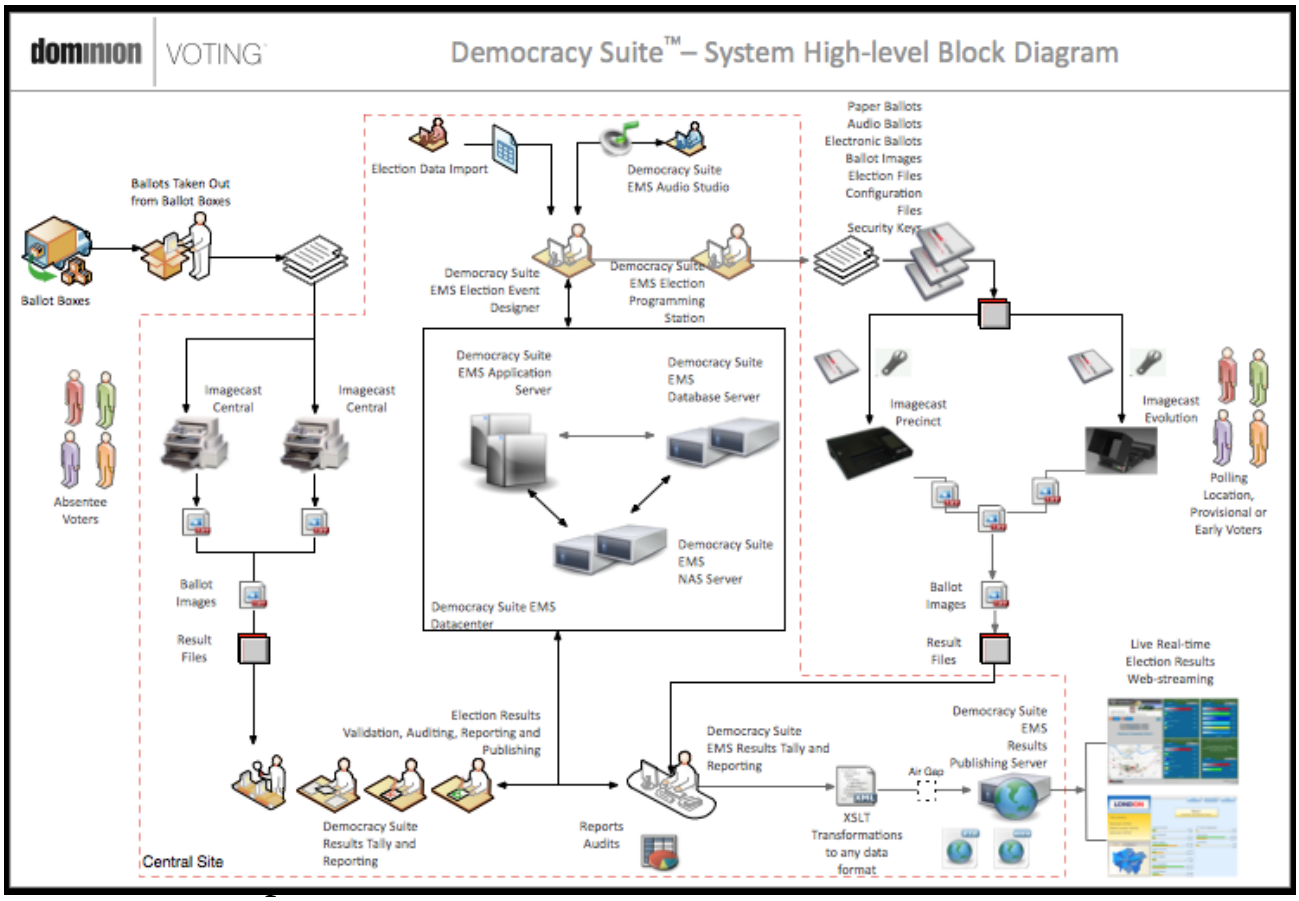


Figure 1-1 System Overview Diagram

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.3 System Limits

The EMS platform will be tested in both deployable physical hardware configurations:

- EMS Express hardware configuration - all EMS software components are installed on a single physical PC or laptop. This is a standalone configuration.
- EMS Standard hardware configuration - the EMS server components are installed on a single physical server, in addition to the Universal Power Supply (UPS) and Local Area Network (LAN) switch devices, while the EMS client components are installed on one or more physical PCs or laptops. All system components are interconnected in a client-server local LAN environment.

The system limits that Dominion Voting Systems has stated to be supported by the Democracy Suite 4.14 are compiled in the table below.

Table 1-4 Democracy Suite 4.14 System Limits for Portrait Ballot Style

Limit (Maximum Number of)	Value (by configuration)		Limiting Component
	Express	Standard	
Ballot Positions	462	462	22 Inch Portrait Ballot
Precincts in Election	250	1000	Memory
Contests in Election	250	4000	Memory
Candidates/Counters in Election	2500	40000	Memory
Candidates/Counters in Precinct	462	462	22 Inch Portrait Ballot
Candidates/Counters in Tabulator	2500	10000	Memory
Ballot Styles in Election	750	4000	Memory
Contests in a Ballot Style	156	156	22 Inch Portrait Ballot
Candidates in a Contest	231	462	22 Inch Portrait Ballot (Column Span 3)
Ballot Styles in a Precinct	10	5	Memory
Number of Parties	30	30	22 Inch Portrait Ballot
Vote For in Contest	30	30	22 Inch Portrait Ballot
Supported Languages per Election	8	5	Memory
Number of Write-ins	462	462	22 Inch Portrait Ballot

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.3 System Limits (Continued)

Table 1-5 Democracy Suite EMS 4.14/ImageCast Ballot Target Limits for Portrait Ballot Style

Ballot Length	Maximum Positions (Row x Column)
11 Inch	33 x 2
14 inch	45 x 3
17 Inch	57 x 3
20 Inch	69 x 3
22 Inch	77 x 3

1.5.4 Supported Languages

The following languages have been stated by Dominion Voting Systems to be supported by the Democracy Suite 4.14:

- Alaska Native
- Aleut
- Athabascan
- Eskimo
- Chinese
- Filipino
- French
- English
- Japanese
- Korean
- Vietnamese
- Spanish
- Native (other group specified)
    - Apache, Jicarilla, Keres, Navajo, Seminole, Towa, Ute, Yuman

Dominion Voting Systems also states that any language that has an ISO definition file can be supported by the Democracy Suite voting System.

Note: All stated languages will be verified to be supported; however, only English and Spanish ballots will be cast during functional testing. Wyle will test English, Spanish, and one character based language (Chinese) during System Integration Testing. Wyle will not be testing the accuracy of the translation of English to Spanish or English to Chinese.

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.5 Supported Functionality

The Democracy Suite 4.14 is designed to support the following voting variations:

- General Election
- Closed Primary
- Early Voting
- Partisan offices
- Non-Partisan offices
- Write-in voting
- Primary presidential delegation nominations
- Straight Ticket voting
- Split Precincts
- Ballot Rotation (equal time only)
- Vote for N of M
- Audio Ballot

1.5.6 VVSG

The Democracy Suite 4.14 will be tested to all applicable EAC 2005 VVSG requirements.

1.5.7 Beyond VVSG

Based on the scope of this modification, no additional test results have been submitted for consideration as part of this test campaign.

2.0 PRE-CERTIFICATION TESTING AND ISSUES

Currently, no pre-certification testing has been completed. Per EAC Notice of Clarification (NOC) 09-001, Wyle views the Certification Test Plan as a living document. It will be updated with "As Run" testing and resubmitted to the EAC as major areas of testing have been completed.

Wyle has performed the first pass review for all source code submitted by Dominion for the Democracy Suite version 4.14 voting system. The issues with compliance to the EAC 2005 VVSG were reported back to the manufacturer for resolution. Subsequent submissions will be reviewed by comparing the new submission against the last submission to ensure all documented issues are resolved before the source code review is completed.

2.0 PRE-CERTIFICATION TESTING AND ISSUES (Continued)

An initial Technical Data Package (TDP) review was performed on the Dominion Democracy Suite version 4.14 voting system documents submitted as their TDP to determine compliance with the EAC 2005 VVSG and EAC requirements. Wyle found some documents were missing or included partial information, and the existing documentation contained information which was not consistent throughout the Dominion TDP. The results were reported to Dominion for resolution. Dominion has subsequently revised and resubmitted the TDP. Wyle is performing a review of these documents and will submit the results to Dominion as documented in Section 4.6 TDP Evaluation. Any incidences of non-certification issues (editing issues such as spelling or formatting) will be noted to Dominion as informational comments for them to decide whether to address them.

2.1 Evaluation of Prior VSTL Testing

Wyle will reutilize all previous testing from the approved Democracy Suite 4.0 (EAC CERTIFICATION NUMBER – DVS-40-G) where applicable or otherwise documented. A breakdown of this information is provided in the tables located in section 4.4.1.

2.3 Known Field Issues

This system has never been fielded in the configuration submitted for EAC 2005 VVSG certification testing. The ImageCast Precinct has been utilized in a small number of elections in New York State. There were no systemic or significant issues traceable to voting system performance.

3.0 MATERIALS REQUIRED FOR TESTING

The materials required for certification testing of the Democracy Suite 4.14 voting system include software, hardware, test materials, and deliverable materials to enable the test campaign to occur will be delivered by Dominion Voting Systems to Wyle.

3.1 Software

The tables below list the software the manufacturer must submit for testing. This section lists all software required for operation and testing of the voting system being certified. This includes the software used for testing security and system integration; as well as supporting software required for the test environment including compilers, assemblers, and database managers, etc. Both COTS and non-COTS software components are listed in this section.

Table 3-1 Democracy Suite 4.14 EMS Software Platform Components

Software Required For Testing	Software Version	Filename
Democracy Suite EMS EED Client Application	4.14	setup.exe, EED_FED_CERT.Setup_64b.msi
Democracy Suite EMS RTR Client Application	4.14	setup.exe, RTR_FED_CERT.Setup_x64.Setup.msi

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-1 Democracy Suite 4.14 EMS Software Platform Components (Continued)

Software Required For Testing	Software Version	Filename
Democracy Suite EMS File System Service Client Application	4.14	setup.exe, DemocracySuiteEMS_FSS_Setup.msi
Democracy Suite EMS Audio Studio Client Application	4.14	setup.exe, EMSAS2010Setup.msi
Democracy Suite EMS Data Center Manager	4.14	DemocracySuiteEMS_DCM.exe
Democracy Suite EMS Application Server	4.14	setup.exe, EMSApplicationServer_FED_CERT.Setup_x64.Setup.msi

Table 3-2 Democracy Suite 4.14 ImageCast Precinct Software Components

Software Required For Testing	Software Version	Filename
Election Firmware	4.14.1-US	cf2xx.sig
Firmware Updater	4.14.1-US	firmUp.enc
Firmware Extractor	4.14.1-US	FirmwareExtract.enc
Kernel (uClinux)	4.14.1-US	Image.bin.gz
Boot Loader (COLILO)	20040221	colilo.bin

Table 3-3 Democracy Suite 4.14 ImageCast Evolution Software Components

Software Required For Testing	Software Version	Filename
Voting Machine	4.14.4	GApplication-4.14.4.vhd.7z
Election Application	4.14.4	dvs
Linux Kernel	2.6.30.9-dvs-21	uImage
Linux Device File	1.3	mpc8347dvs.dtb

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-3 Democracy Suite 4.14 ImageCast Evolution Software Components (Continued)

Software Required For Testing	Software Version	Filename
Root File System	1.0.1	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	1.3.4.26	u-boot.bin
Motherboard FPGA	1.1.2	ice2_mc_p1.bit
Scanner Board FPGA	1.1.1	ice2_scb_p2.bit
Logger Controller	1.0.11	logger.bin
Power Controller	2.0.3	power.bin
Integrated Printer	4.1.6	integratedPrinter.hex, printerFont.hex

Table 3-4 Democracy Suite 4.14 ImageCast Central Software Components

Software Required For Testing	Software Version	Filename
ImageCast Central Application	4.14.4	ImageCast Central.exe
Image-Analysis DLL	4.14.4	ImgProc.dll
Windows 7	COTS	Operating System for COTS ICC computer when using Canon DR-X10C scanner

Table 3-5 Democracy Suite 4.14 EMS Software Platform Third Party Software Components

Software Required For Testing	Software Version	Filename
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi
TX Text Control Library for .NET	16.0	TX Text Control.NET for Windows Forms 16.0.exe

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-6 Democracy Suite 4.14 EMS Client Application Software Components

Software Required For Testing	Software Version	Filename
Microsoft Windows 7 x64	6.1	Microsoft DVD provided
Windows Server 2008 R2 x64	6.1	Microsoft DVD provided
Adobe Reader	10.1.1	AdbeRdr1011_en_US.exe
Microsoft .NET Framework 4.0	4.0	dotNetFx40_Full_x86_x64.exe
Microsoft SQL Server 2008 R2 x64	10.0	Microsoft DVD provided
Microsoft SQL Server 2008 Express R2 x64	10.50.2500.0	SQLEXPRADV_x64_ENU.exe
Microsoft SQL Server 2008 R2 SP1x64	10.51.2500.0	SQLServer2008R2SP1-KB2528583-x64-ENU.exe
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	vjredist64.exe
1-Wire Driver version 4.0.3b x64	4.0.3	install_1_wire_drivers_x64_v403beta.msi
Java Runtime Environment 6.0 x64	6.0.290	jre-6u29-windows-x64.exe
Microsoft Visual C++ 2010 SP1 Redistributable Package(x86)	10.0.40219	vcredist_x86.exe

Table 3-7 Democracy Suite 4.14 EMS Software Platforms Unmodified COTS Components

Software Required For Testing	Software Version	Filename
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi (for details see document Components_3rdParty_1.0.xlsx)
TX Text Control Library for .NET	16.0	TX Text Control.NET for Windows Forms 16.0.exe (for details see document Components_3rdParty_1.0.xlsx)
Microsoft.Net Framework Library	4.0	dotNetFx40_Full_x86_x64.exe (for details see document Components_3rdParty_1.0.xlsx)
Sox	14.3.1	sox.exe,libgomp-1.dll,pthreadgc2.dll,zlib1.dll (for details see document Components_3rdParty_1.0.xlsx)
Log4net	1.2.10	log4net.dll, log4net.xml (for details see document Components_3rdParty_1.0.xlsx)

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-7 Democracy Suite 4.14 EMS Software Platforms Unmodified COTS Components (Continued)

Software Required For Testing	Software Version	Filename
NLog	1.0.0.505	NLog.dll (for details see document Components_3rdParty_1.0.xlsx)
iTextSharp	5.0.5	itextsharp.dll (for details see document Components_3rdParty_1.0.xlsx)
OpenSSL	1.2	openssl.exe, lebeay32.dll, ssleay32.dll (for details see document Components_3rdParty_1.0.xlsx)
SQLite	1.0.65.0	System.Data.SQLite.DLL 32-bit and 64-bit (for details see document Components_3rdParty_1.0.xlsx)
Lame	3.99.4	lame.exe (for details see document Components_3rdParty_1.0.xlsx)
Speex	1.0.4	speexdec.exe and speexenc.exe (for details see document Components_3rdParty_1.0.xlsx)
Ghostscript	8.71	gsdll32.dll – both 32-bit and 64-bit (for details see document Components_3rdParty_1.0.xlsx)
PdfToImage	1.2	PdfToImage.dll (for details see document Components_3rdParty_1.0.xlsx)
SharpSSh package	1.1.1.13	Tamir.SharpSSH.dll, Diffie.Hellman.dll, Org.Mentalis.Security.dll (for details see document Components_3rdParty_1.0.xlsx)
One Wire API for .NET	4.0.2.0	OneWireAPI.NET.dll (for details see document Components_3rdParty_1.0.xlsx)
Avalon-framework-cvs-20020806	20020806	avalon-framework-cvs-20020806.jar (for details see document Components_3rdParty_1.0.xlsx)
Batik	0.20-5	batik.jar (for details see document Components_3rdParty_1.0.xlsx)

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-7 Democracy Suite 4.14 EMS Software Platforms Unmodified COTS Components (Continued)

Software Required For Testing	Software Version	Filename
Fop	0.20-5	fop.jar (for details see document Components_3rdParty_1.0.xlsx)
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	vjc.dll,vjsjbc.dll,vjslibcw.dll,vjsnativ.dll,vjssupuilib.dll,vjsvwaux.dll (for details see document Components_3rdParty_1.0.xlsx)

Table 3-8 Democracy Suite 4.14 ImageCast Precinct Unmodified COTS Software Components

Software Required For Testing	Software Version	Filename
PNG Reference Library	1.2.24	libpng-1.2.24.tar.gz
OpenSSL	1.1.2	Openssl-fips-1.1.2.tar.gz
Zlib	1.2.3	Zlib-1.2.3.tar.gz

Table 3-9 Democracy Suite 4.14 ImageCast Evolution Unmodified COTS Software Components

Software Required For Testing	Software Version	Filename
autoconf	2.57	autoconf-2.57.tar.bz2
bison	2.3	bison-2.3.tar.bz2
busybox	1.20.2	busybox-1.18.5.tar.bz2
ccache	2.4	ccache-2.4.tar.gz
cksum	19990607	cksum-19990607.tar.gz
cramfs	20081121	cramfs-20081121.tar.gz
distcc	2.18.3	distcc-2.18.3.tar.bz2
dtc	1.2.0	dtc-1.2.0.tar.gz
e2fsprogs	1.42.2	e2fsprogs-1.41.14.tar.gz
expat	2.0.1	expat-2.0.1.tar.gz
flex	2.5.33	flex-2.5.33.tar.gz
fontconfig	2.9.0	fontconfig-2.8.0.tar.gz
freetype	2.4.9	freetype-2.4.4.tar.bz2
genext2fs	1.4.1	genext2fs-1.4.1.tar.gz
gen_init_cpio	2.6.25-rc7	gen_init_cpio-2.6.25-rc7.tar.gz
genromfs	0.5.1	genromfs-0.5.1.tar.gz

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-9 Democracy Suite 4.14 ImageCast Evolution Unmodified COTS Software Components (Continued)

Software Required For Testing	Software Version	Filename
Git	1.5.6.5	git-1.5.6.5.tar.gz
i2c-tools	3.1.0	i2c-tools-3.0.3.tar.bz2
jpegsrc	v8d	jpegsrc.v8c.tar.gz
libogg	1.3.0	libogg-1.2.2.tar.gz
Libpng	1.5.10	libpng-1.5.4.tar.gz
libtool	1.5	libtool-1.5.tar.gz
libusb	1.0.8	libusb-1.0.8.tar.bz2
libusb-compat	0.1.3	libusb-compat-0.1.3.tar.bz2
linux	2.6.30.9	linux-2.6.30.9.tar.bz2
lkc	1.4	lkc-1.4.tar.gz
mkspooflinks	3.4	mkspooflinks-3.4.tar.gz
mtd-utils	20060302	mtd-utils-20060302.tar.bz2
mux_server		mux_server.c
openssl-fips	1.2.3	openssl-fips-1.2.3.tar.gz
pkg-config	0.21	pkg-config-0.21.tar.gz
ppp	2.4.5	ppp-2.4.5.tar.gz
qt-everywhere	4.7.3	qt-everywhere-opensource-src-4.7.3.tar.gz
skell	1.19	skell-1.19.tar.gz
soundtouch	1.5.0	soundtouch-1.5.0.tar.gz
sparse	0.4	sparse-0.4.tar.gz
speex	1.2rc1	speex-1.2rc1.tar.gz
sqlite	3.7.13	sqlite-autoconf-3070701.tar.gz
sysfsutils	2.1.0	sysfsutils-2.1.0.tar.gz
texinfo	4.8	texinfo-4.8.tar.bz2
tiff	4.0.1	tiff-3.9.5.tar.gz
tunctl	1.5	tunctl-1.5.tar.gz
tzcode	2012b	tzcode2011g.tar.gz
tzdata	2012c	tzdata2011h.tar.gz
u-boot-tools	1.1.6	u-boot-tools-1.1.6.tar.bz2
unifdef	1.0	unifdef-1.0.tar.gz
usb-modeswitch	1.1.7	usb-modeswitch-1.1.7.tar.bz2
usb-modeswitch-data	20110227	usb-modeswitch-data-20110227.tar.bz2
wget	1.9.1	wget-1.9.1.tar.gz
yaffs_utils	20060418	yaffs_utils-20060418.tar.gz

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-9 Democracy Suite 4.14 ImageCast Evolution Unmodified COTS Software Components (Continued)

Software Required For Testing	Software Version	Filename
zlib	1.2.7	zlib-1.2.5.tar.bz2
rpm	4.0.4	rpm-4.0.4.tar.gz

Table 3-10 Democracy Suite 4.14 - ImageCast Central Build Environment Software Build Components (Unmodified COTS)

Software Required For Build	Software Version	Filename
Windows 7	Home Premium	OEM installed, or full CD from Microsoft
Windows XP	Professional	OEM installed, or full CD from Microsoft
Visual Studio	2005	Full CD from Microsoft

Table 3-11 Democracy Suite 4.14 - ImageCast Central Build Environment Setup Software Utilities (Unmodified COTS)

Software Required For Build	Software Version	Filename
7-Zip	9.20	7z920.exe
Active Perl 64-bit	5.12.4.1205	ActivePerl-5.12.4.1205-MSWin32-x64-294981.msi
Nasm	2.09.07	nasm-2.09.07-win32.zip

Table 3-12 Democracy Suite 4.14 - ImageCast Central Software Build Library Source Code (Unmodified COTS)

Software Required For Build	Software Version	Filename
OpenSSL	FIPS 1.2.3	openssl-fips-1.2.3.tar.gz

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-13 Democracy Suite 4.14 - ImageCast Central Runtime Software Components (Unmodified COTS)

Software Required For Testing ICC application	Software Version	Filename
Imgcomp.dll	2.11	apiman.zip
1 Wire driver 64-bit	4.03	install_1_wire_drivers_x64_v403.msi
Kofax VRS	4.50	Full CD from Kofax
VCredist	4/10/2006	vcredist_x86.exe

Table 3-14 Democracy Suite 4.14 ImageCast Precinct Modified COTS Software Components

Software Required For Testing	Software Version	Filename
uClinux	20070130	uClinux-dist-20070130.tar.gz
COLILO Boot Loader	20040221	Colilo20040221.tar.gz

Table 3-15 Democracy Suite 4.14 ImageCast Evolution Modified COTS Software Components

Software Required For Testing	Software Version	Filename
Kernel	2.6.30.9-dvs-21	uImage
U-BOOT	1.3.4.26	u-boot.bin

Table 3-16 Democracy Suite 4.14 EMS Software Build Environment Components

Software Required For Testing	Software Version	Filename
Microsoft Windows Server 2008 R2 x64	6.1	Microsoft DVD provided
7-Zip	9.20	7z920-x64.msi
Microsoft Visual Studio 2010	10.0	Microsoft DVD provided

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-16 Democracy Suite 4.14 EMS Software Build Environment Components (Continued)

Software Required For Testing	Software Version	Filename
Microsoft SDK for Windows 7	7.1	GRMSDKX_EN_DVD.iso
Microsoft.NET Framework Library	4.0	
Microsoft Visual Studio 2010 Service Pack 1	10.0 SP1	VS2010SP1dvd1.iso
Microsoft patch KB2286556	N/A	VS10-KB2286556-x86.exe
ImgBurn	2.5.7.0	SetupImgBurn_2.5.7.0.exe
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi
TX Text Control Library for .NET	16.0	TX Text Control.NET for Windows Forms 16.0.exe
Speex	1.0.4	speex_win32_1.0.4_setup.exe
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	vjredist64.exe
ActivePerl	5.12.4	ActivePerl-5.12.4.1205-MSWin32-x64-294981.msi

Table 3-17 Democracy Suite 4.14 ImageCast Precinct Election Firmware Compiler

Software Required For Testing	Software Version	Filename
g++ (GNU C++ compiler)	gcc3.4.0-20040603	m68k-uclinux-tools-c++-gcc3.4.0-20040603.sh

Table 3-18 Democracy Suite 4.14 ImageCast Evolution Election Firmware Compiler

Software Required For Testing	Software Version	Filename
g++ (GNU C++ compiler)	gcc-4.5.38-eglibc-2.11.38	freescale-powerpc-linux-gnu-2011.03-38.i686.rpm

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-19 Democracy Suite 4.14 ImageCast Precinct Firmware Build Environment Components

Software Required For Testing	Software Version	Filename
Ubuntu 10.04 LTS – Long-term support	10.04	ubuntu-10.04.2-desktop-amd64.iso
Toolchain Installation Script	N/A	Toolchain.sh
m68k uClinux tools base gcc	3.4.0-20040603	m68k-uclinux-tools-base-gcc3.4.0-20040603.sh
m68k uClinux tools c++ gcc	3.4.0-20040603	m68k-uclinux-tools-c++-gcc3.4.0-20040603.sh
m68k uClinux tools gdb	20040603	m68k-uclinux-tools-gdb-20040603.sh
OpenSSL	1.1.2	Openssl-fips-1.1.2.tar.gz

Table 3-20 Democracy Suite 4.14 ImageCast Evolution Firmware Build Environment Components

Software Required For Testing	Software Version	Filename
Ubuntu	10.04 LTS	ubuntu-10.04.3-desktop-i386.iso
LTIB	10.1.1a	ltib-10-1-1a-sv.tar.gz
g++ (GNU C++ compiler)	gcc-4.5.38-eglibc-2.11.38	freescale-powerpc-linux-gnu-2011.03-38.i686.rpm

3.2 Equipment

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

Every effort is made to verify that the COTS equipment has not been modified for use. Wyle will perform research using the COTS equipment manufacturers' websites based on the serial and service tag numbers for each piece of equipment and will evaluate COTS hardware, system software and communications components for proven performance in commercial applications other than elections. For PCs, laptops, and servers, the service tag information is compared to the system information found on each machine. Physical external and internal examination is also performed to the best of Wyle's abilities when the equipment is easily accessible without the possibility of damage. Hard drives, RAM memory, and other components are examined to verify that the components match the information found on the COTS equipment manufacturers' websites.

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

The manufacturer provided the hardware listed in Table 3-21 for the purpose of testing two documented system configurations: Standard and Express. This hardware consists of PCs, Application/Database Servers, encrypted Network Attached Storage (NAS) servers, and ruggedized encrypted portable hard drives.

The system configurations consist of:

- **Standard:** (1) PC, (1) Application Server/ Database Server, (1) encrypted NAS for Application/Database Server
- **Express:** (1) PC and (1) Portable Hard Drive

Table 3-21 Democracy 4.14 Voting System Equipment Descriptions

Equipment	Manufacturer	Version/Model	Specifications	Serial Number
PC1	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61VNNM1
PC2	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61TPNM1
PC3	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61YMNM1
PC4	Dell	Precision T1500	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB	61TNNM1
PC5	Dell	Inspiron One 2305	Processor: AMD Athlon II X2 240e 2.8 GHz, Memory: 8GB Dual Channel 1333MHz DDR3, Hard Drive Capacity: 1 TB	564C3P1
LAPTOP1	Dell	Latitude E6530	Intel Core i5 CPU 3230M @ 2.5GHz 4.00 GB Installed RAM HD Capacity 500 GB	2779CW1
LAPTOP2	Dell	Latitude E6530	Intel Core i5 CPU 3230M @ 2.67GHz 4.00 GB Installed RAM HD Capacity 500 GB	1SD9CW1
SERVER1	Dell	PowerEdge R610	Processor: Intel Xeon E5620 2.4 GHz, Memory: 8x 2GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	5M9NNM1
SERVER2	Dell	PowerEdge R610	Processor: Intel Xeon E5620 2.4 GHz, Memory: 8x 2GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	5M8PNM1
SERVER3	Dell	PowerEdge R610	Processor: Intel Xeon E5620 2.4 GHz, Memory: 8x 2GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	5M8QNM1
SERVER4	Dell	PowerEdge T620	Processor: Intel Xeon E5620 2.0 GHz, Memory: 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500 GB	9J9NQW1

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-21 Democracy 4.14 Voting System Equipment Descriptions (Continued)

Equipment	Manufacturer	Version/Model	Specifications	Serial Number
STORAGE1	Rocstor	Guardian 4RM Raid System	Disk space: 2 TB (Striped + Mirrored), Processor: 400 MHz storage I/O, Hot bus interface: eSATA, Drive bus interface: SATA II	ROC7326210 47/SB090101 54
STORAGE2	Rocstor	Guardian 4RM Raid System	Disk space: 2 TB, Processor: 400 MHz storage I/O, Hot bus interface: eSATA, Drive bus interface: SATA II	ROC7326210 45/SB090101 57
STORAGE3	Rocstor	Guardian 4RM Raid System	Disk space: 2 TB, Processor: 400 MHz storage I/O, Hot bus interface: eSATA, Drive bus interface: SATA II	ROC7326210 46/SB090101 61
STORAGE4	Rocstor	Commander 2UE Portable Hard Drive	Hard Drive Capacity: 500 GB	5VJ6V8HL
STORAGE5	Rocstor	Commander 2UE Portable Hard Drive	Hard Drive Capacity: 500 GB	5VJ48VFJ

In order to perform the software Witness and Trusted Builds, one Personal Computer has been provided as a build machine. The build machine is described in the table below:

Table 3-22 Build Machine Description

Equipment	Manufacturer	Version/Model	Serial Number	COTS/ Non-COTS
Build 1	Super Micro PC w/4 Hard Drives	PC w/4 Hard Drives	BM-57381-001	COTS

To support the test program, Dominion has provided additional supporting hardware for the provided Personal Computers. A list of these items is provided in Table 3-23.

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-23 Democracy 4.14 COTS Voting System Support Equipment

Test Material	Make	Model	Quantity	Serial Number
COTS Central High Speed Scanner	Canon	DR-X10C	2	ED300874, ED300880
iButton (SHA-1) with USB Reader/Writer	Maxim	USB R/W: DS9490R iButton: DS1963S	3	4D027C, 4C9CF5, 514DFD
iButton (SHA-1)	Maxim	DS1963S	2	4CE4C9, 4D064A
LCD Monitor	Soyo	18.5" wide LCD	1	DYLM19R6-KLE-10202
LCD Monitor	Samsung	23" wide LCD	1	MY23HVMS701197B
LCD Monitor	Dell	1909W	4	07E-4EUS, 07F-071S, 07F-06US, 07F-074S
LCD Monitor	Dell	N445N	3	2TWC, 2UOC, 2U6C
Audio Adapter	Soundwave	USB Soundwave 7.1 Audio Adapter	2	SW-57381-001, SW-57381-002
PCI Software	Soundwave	Soundwave 7.1 PCI Software	2	n/a
USB Software	Soundwave	USB Soundwave 7.1 Software	1	n/a
Networking Switch	D-Link	D-Link DES-1105 5-Port Switch	1	DRL728A001397
Mouse	Dell	USB w/rollerball	4	G1A00M0M, 10203JTI, LZA30491960, 438027372
Mouse	Microsoft	USB w/rollerball	1	X800898
Keyboard	Kensington	USB	1	D0713000487
Keyboard	Microsoft	USB	1	6968200717217
Keyboard	IBM	USB	1	2162079
Compact Flash Reader	SanDisk	USB	3	0171618, 0201833, 0171631
Networking Switch	D-Link	DGS-2208 8-Port Switch	2	F36J69C004821, F36J69C004824
Headphones	Radio Shack	33-276-01	1	Headphones
eSATA PCI Card (Installed into Servers and PCs)	SIIG, Inc.	eSATA II PCIe Pro Card	7	n/a
Card Reader	GGI Gear	Compact Flash Card Reader	4	CFRW-57381-001 thru 004
Sony	Headphone	MDR-G45LP-01	1	Sony

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-23 Democracy 4.14 COTS Voting System Support Equipment (Continued)

Test Material	Make	Model	Quantity	Serial Number
Cyber Acoustics Headphone	Cyber Acoustics	ACM-70	2	DVS23000048
Sip & Puff	Origin Instruments	Air Voter	7	AV-57381-001 thru 003, 002251, 002268, 002267
Footswitch Pair	4	Kinesis	4	FS-57381-001 thru 004
#970 Armrest Sip & Puff Attachment	6	Enabling Devices	6	AR-57381-001 thru 006
Compact Flash	RiData	CFC-14A	50	Wyle-assigned numbers: CF-XXX

The table below provides the serial numbers of the equipment submitted for testing:

Table 3-24 Democracy 4.14 Voting System Equipment

Equipment	Description	Serial Number
ICP	Precinct Count Optical Scanner PCOS 320A	WLDAFBH0005, WLDAFBH0023
	Precinct Count Optical Scanner PCOS 320C	WLDAFBH0002, WLDAFBH0018
	Precinct Count Optical Scanner PCOS 410A	ICE2P200002, ICE2P200004, CAFEBDB0008, CAFEBDC0015
ICP Ballot Box	Externally secure plastic ballot box	T70251-01
	Externally secure metal ballot box	Box-57381-011, Box-57381-012, Box-57381-014
ICE Ballot Box	Externally secure plastic ballot box	T70251-Box-02, T70251-Box-03
	Externally secure metal ballot box	Box-57381-015

3.3 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 following test materials are required to support the Democracy Suite 4.14 certification testing:

Table 3-25 Democracy Suite 4.14 Test Support Materials

Test Material	Quantity	Make	Model
Hasp Locks (red)	50	N/A	N/A
Tamper Evident Seals	50	N/A	SE-37
Disposable Gloves	3	N/A	N/A
Gloves and Mouthpiece Kit	17	N/A	N/A
Green and White Mouthpiece Kit	5	N/A	N/A
Black and Clear Mouthpiece	2	N/A	N/A
ATI Handsets	12	Dominion	ATI-57381-001 thru 012

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-25 Democracy Suite 4.14 Test Support Materials (Continued)

Test Material	Quantity	Make	Model
Black Ballot Privacy Sleeves	4	Dominion	N/A
White Ballot Privacy Sleeves	4	Dominion	N/A
Black Privacy Panels (set of 2 pieces)	4	Dominion	N/A
White Privacy Panels	4	Dominion	N/A
Thermal Printer Rolls	100	N/A	N/A
Combination Lock	2	MASTER Lock	646T
Keyed Lock	4	MASTER Lock	121Q
Security Keys	50	Maxim	N/A
Ballots	6000	Dominion	N/A
Dominion Cleaning Kit	2	Dominion	N/A
Permanent Markers	20	p/n SHARPIE1 BK	N/A

The materials listed below are to be delivered as part of the Democracy 4.14 System to the users:

Table 3-26 Deliverable Materials

Deliverable Material	Version	Description
Election Event Designer	4.14.22	EMS client application
Results Tally and Reporting	4.14.22	EMS client application
Audio Studio	4.14.22	EMS client application
Application Server	4.14.22	EMS server application
Datacenter Manager	4.14.22	EMS server application
ImageCast Evolution	400A w/Firmware version 4.14.10	Precinct ballot scanner and ADA accessible voting device
ImageCast Evolution	410A w/Firmware version 4.14.10	Precinct ballot scanner and ADA accessible voting device
ImageCast Precinct	320A w/Firmware version 4.14.5	Precinct ballot scanner and ADA accessible voting device
ImageCast Precinct	320C w/Firmware version 4.14.5	Precinct ballot scanner and ADA accessible voting device
ImageCast Central Count	Canon DR-X10C w/Firmware version 4.14.4	Central ballot scanner
ImageCast Evolution Ballot Box	BOX-400A	ICE Metal Ballot box
	BOX-410A	ICE Plastic Ballot box
ImageCast Precinct Ballot Box	BOX-310A	ICP Metal Ballot box
	BOX-330A	ICP Plastic Ballot box

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-26 Deliverable Materials (Continued)

Deliverable Material	Version	Description
Rocstor Encrypted NAS	Dell PowerEdge R610	Encrypted Network Attached Storage module for server and data backup
Rocstor Portable Hard Drive	Rocstor Commander 2UE Portable Hard Drive	Encrypted and ruggedized external hard drive
iButton with Reader/Writer	Maxim USB R/W: DS9490R iButton: DS1963S	Security authentication token with programmer
Gigabit Network Switch	D-Link DGS-2208 8-Port Switch	Network switch for standard or enterprise configuration
ICE/ICP Headphones	Cyber Acoustics	Headphones used for audio voting
Sip/Puff Device	Origin Instruments Air Voter	Binary input device for disabled voters
ICP System Operation Procedures	1.1.0::169	TDP Document
EMS System Operation Procedures	1.2.0::448	TDP Document
ICE System Operation Procedures	1.0.0::120	TDP Document
ICC System Operation Procedures	1.1.0::103	TDP Document
ICP System Maintenance Manual	1.1.0::66	TDP Document
ICE System Maintenance Manual	1.1.0::115	TDP Document
EMS System Maintenance Manual	1.0.1::154	TDP Document
Election Event Designer User's Guide	1.0.0::91	TDP Document
Results Tally and Reporting User's Guide	1.0.0::24	TDP Document
Audio Studio User's Guide	1.1.0::169	TDP Document

4.0 TEST SPECIFICATIONS

Modification testing of the Democracy Suite 4.14 is the configuration submitted in the EAC application DVS-1201. Wyle qualified personnel will ensure that all certification testing performed on the manufacturer's voting system follows Wyle's procedures for testing and the specific test cases to ensure the requirements of the EAC 2005 VVSG and EAC Testing and Certification Program Manual are met.

Below is a list of EAC Request for Interpretations (RFI) and Notice of Clarifications (NOC) that will be incorporated in the test campaign:

4.0 TEST SPECIFICATIONS (Continued)

Interpretations

2012-06 EAC Decision on Use of Public Telecommunications Networks and Data Transmission

2012-05 EAC Decision on Public Telecommunications and Cryptography

2012-04 EAC Decision on Software Setup Validation

2012-03 EAC Decision on Configuration of COTS Products

2012-02 EAC Decision on Transmission of Results (Official and Unofficial Results)

2012-01 EAC Decision on Ballot Handling – Multi-feed

2010-08 EAC Decision on Calling Sequence

2010-07 EAC Decision on Module Length

2010-06 EAC Decision on DRE Accessibility Requirements and Other Accessible Voting stations

2010-05 EAC Decision on Testing of Modifications to a Certified System

2010-04 EAC Decision on Functional Requirements with Respect to Security

2010-03 EAC Decision on Database Coding Conventions

2010-01 EAC Decision on Voltage Levels and ESD Test

2009-06 EAC Decision on Temperature and Power Variation

2009-05 EAC Decision on T-Coil Requirements

2009-04 EAC Decision on Audit Log Events

2009-03 EAC Decision on Battery Backup for Central Count Systems

2009-02 EAC Decision on Alternate Languages

2009-01 EAC Decision on VVPAT Accessibility New

2008-12 AC Decision on Ballot Marking Device/Scope of Testing

2008-10 EAC Decision on Electrical Fast Transient

2008-09 EAC Decision on Safety Testing

2008-08 EAC Decision on Automatic Bar Code Readers

2008-07 EAC Decision on Zero Count to Start Election

2008-06 EAC Decision on Battery Backup for Central Count

2008-05 EAC Decision on Durability

2008-04 EAC Decision on Supported Languages

2008-03 EAC Decision on OS Configuration

2008-02 EAC Decision on Battery Backup for Optical Scan Voting Machines

2008-01 EAC Decision on Temperature and Power Variation

2007-06 EAC Decision on Recording and Reporting Undervotes

2007-05 EAC Decision on Testing Focus and Applicability

2007-04 EAC Decision on Presentation of Alternative Language

4.0 TEST SPECIFICATIONS (Continued)

2007-03 EAC Decision on Summative Usability Testing

2007-02 EAC Decision on Variable Names

2007-01 EAC Decision on Accessible Design

Notice of Clarifications

NOC 2012-02 – Clarification of System Identification Tool Functionality

NOC 2012-01 – Clarification of COTS Product Equivalency for De Minimis Change

NOC 2011-01 – Clarification of De Minimis Change Determination Requirements Related to Data

NOC 09-005 – Development and Submission of Test Plans for Modifications to EAC Certified Systems

NOC 09-004 – Development and Submission of Test Reports

NOC 09-003 – De Minimis Change Determination Requirement

NOC 09-002 -- Laboratory Independence Requirement

NOC 09-001 -- Requirements for Test Lab Development and Submission of Test Plans

NOC 08-003 -- EAC Conformance Testing Requirements

NOC 08-002 -- EAC Mark of Certification

NOC 08-001 -- Validity of Prior Non-core Hardware Environmental and EMC Testing

NOC 07-005 -- Voting System Test Laboratory Responsibilities in the Management and Oversight of Third Party Testing

NOC 07-004 -- Voting System Manufacturing Facilities

NOC 07-003 -- State Testing Done in Conjunction with Federal Testing within the EAC Program

NOC 07-002 -- VSTL Work with Manufacturers Outside of Voting System Certification Engagements

NOC 07-001 -- Timely Submission of Certification Application

4.1 Requirements (Strategy of Evaluation)

To evaluate the system test requirements, each section of the EAC 2005 VVSG will be 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 will be tested during the FCA and System Integration test utilizing the "Wyle Baseline Test Cases" along with test cases specially designed for the Dominion Democracy Suite 4.14 per sections 4.4.3 and 4.4.4. The data input during these tests will be the predefined election definitions submitted as part of the Test Plan Package.
- **Section 3: Usability and Accessibility** – The requirements in this section will be tested during the Usability Test utilizing a combination of the "Wyle Baseline Test Cases" and the "Wyle Baseline Usability Test Cases". The data input during this test will be the predefined election definitions submitted as part of the Test Plan Package.

4.0 TEST SPECIFICATIONS (Continued)

4.1 Requirements (Strategy of Evaluation)

- **Section 4: Hardware Requirements** – The requirements in this section will be tested and/or evaluated by trained Wyle personnel per sections 4.4.2 and the table in section 6.
- **Section 5: Software Requirements** – The requirements in this section will be tested during source code review, TDP review, and FCA. A combination of review and functional testing will be performed to ensure these requirements are met.
- **Section 6: Telecommunication** – A test of the telecommunication technologies utilized by the Dominion Democracy Suite 4.14 will be tested for data accuracy and correctness by analyzing the packet level information being transmitted. Section 6.2.6 will be excluded since the Democracy Suite 4.14 does not support the use of public networks.
- **Section 7: Security Requirements** – The requirements in this section will be tested during source code review, FCA, System Integration, and Security Tests.
- **Section 8: Quality Assurance (QA) Requirements** – The requirements in this section will be tested throughout the test campaign via various methods. TDP review will be performed on the Dominion QA documentation to determine compliance to EAC 2005 VVSG requirements and the requirements stated in the Dominion Voting Systems QA Program document. All source code will be checked to ensure that proper QA documentation has been completed. All equipment received for initial testing and follow up testing will be checked against Dominion documentation to ensure their QA process is being followed. Wyle personnel will complete the requirements of EAC 2005 VVSG Vol. 2 Section 7, Quality Assurance Testing and Section 1.3.1.5, Focus of Vendor Documentation that requires Wyle personnel to physically examine documents at Dominion's location or conduct an external evaluation utilizing equipment, documents and support information provided by Dominion during the test campaign.
- **Section 9: Configuration Management (CM) Requirements** – The requirements in this section will be tested throughout the test campaign. TDP review will be performed on the Dominion configuration management documentation to determine EAC 2005 VVSG compliance and to further determine whether Dominion is following its documented CM requirements within the TDP. During source code review, Wyle qualified personnel will verify that Dominion Voting Systems is following EAC 2005 VVSG CM requirements as well as Dominion CM requirements. Any anomalies will be formally reported to Dominion and the EAC. All equipment received for testing will be checked against Dominion documentation to ensure their CM process is being followed.

Wyle 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 WoP's pertaining to the test environment, the equipment arrangement and method of operation, the specified test procedure, or the provision of test instrumentation and facilities, 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.)

Wyle utilizes an internal bug tracking system in order to capture and track all issues and discrepancies found during the testing campaign. This allows for all issues and discrepancies to be monitored for reoccurrence, tracks the root cause analysis, and provides a resolution status. Wyle shall verify all items logged into the bug tracking system are resolved prior to the completion of testing and before any recommendation may be made for certification.

4.0 TEST SPECIFICATIONS (Continued)

4.1 Requirements (Strategy of Evaluation) (Continued)

The designated Wyle Operating Procedures (WoP's) for this program are listed below together with the identification and a brief description of the hardware and software to be tested and any special considerations that affect the test design and procedure.

The specific Wyle WoP's to be used during testing include the following:

- WoP 1 Operations Status Checks
- WoP 2 Receipt Inspection
- WoP 3 Technical Data Package Review
- WoP 4 Test Plan Preparation *(This document)*
- WoP 5a-d Source Code Review
- WoP 6a-d Security
- WoP 7 Trusted Build
- WoP 9 Electromagnetic Emissions
- WoP 21 Environmental Operating_Accuracy_Reliability (Temp/Power)
- WoP 24 1 – 1g Usability
- WoP 24 2 – 2h Accessibility
- WoP 25 Physical Configuration Audit
- WoP 26 Functional Configuration Audit
- WoP 27 Maintainability
- Wop 28 Availability
- Wop 29 Electrical Supply
- WoP 30 System Integration Test
- WoP 31 Telecommunications
- WoP 34 Test Report
- WoP 36 Vote Recording Requirements
- WoP 41 Logic & Accuracy

4.1.1 Rationale for 'Not Applicable' Requirements

The Dominion Voting Systems Democracy Suite 4.14 is a paper-based precinct counting system that supports a closed network (does not support transmission over public networks). Therefore, all EAC 2005 VVSG requirements, with the exceptions listed below, will be evaluated as part of this test campaign.

4.0 TEST SPECIFICATIONS (Continued)

4.1.1 Rationale for 'Not Applicable' Requirements (Continued)

- Volume I Section 6.2.6 (Telecommunication Requirements)
- Volume I Section 7.5.2 – 7.5.4 (Telecommunications and Data Transmission)
- Volume I Section 7.6 (Use of Public Communication Networks)
- Volume I Section 7.7 (Wireless Communications)
- Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the Democracy Suite 4.14 to the requirements contained in the indicated sections of the EAC 2005 VVSG is described below.

Table 4-1 Not Applicable Requirements

EAC 2005 VVSG Volume I Section	Rationale for 'Not Applicable'
6.2.6, 7.5.2, and 7.5.3	These requirements are written for use of public networks. The Dominion Democracy Suite 4.14 does not use public networks.
7.5.4	This section was intended for a shared operating environment on ballot recording and vote counting equipment. The ICE and ICP use dedicated operating environments and will be excluded from this requirement. The EMS and ICC components do use a shared operating environment and will be tested to this VVSG clause.
7.6	This section pertains to "Voting systems that transmit data over public telecommunications…" The Dominion Democracy Suite 4.14 does not support transmission over public networks.
7.7	No wireless technology is present in the Dominion Democracy Suite 4.14.
7.9	The Dominion Democracy Suite 4.14 is a paper based system.

4.2 Hardware Configuration and Design

The Dominion Voting Systems Democracy Suite is a paper-based optical scan voting system. The Democracy Suite system consists of four major components: the EMS, ICE precinct scanner and ballot marking device, ICP precinct scanner, and ICC central count scanner. The Democracy Suite is comprised of two proprietary pieces of hardware (ICE and ICP) and one piece of COTS hardware (ICC). All EMS functions are handled by proprietary software running on COTS PC/laptops/servers. Wyle has determined that these COTS PC/laptops/servers are not subject to hardware testing per the EAC 2005 VVSG. The provided PC/laptops/servers documented in Section 3 Materials Required For Testing all contained CE, UL, and FCC labeling.

ICP – A PCA and quick scan was performed on the ICP component to verify the changes and effects caused by the changes to the unit. No additional hardware testing will be required based on the findings of the evaluation. Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the Democracy Suite 4.0 approved certification testing (EAC CERTIFICATION NUMBER – DVS-40-G). Wyle will be utilizing the data obtained during that test effort to satisfy requirements for this modification test campaign.

4.0 TEST SPECIFICATIONS (Continued)

4.2 Hardware Configuration and Design (Continued)

ICE - ICE will be set on the ballot box to simulate the actual election configuration. During operational tests the unit will be in auto feed mode ("Shoe-Shine") and scan test ballots for the duration of the operational test.

Each unit will be loaded with the Operational Status Check Hardware election definition configured for early voting. This will allow all the data generated for the Pre-operational, Operational, and Post-operational test to be further analyzed, compiled and included in the Reliability and Availability Test results.

ICC - ICC consists of COTS scanners and COTS Workstation PCs. The Canon DR-X10C scanners and the Dell Inspiron One 2305 Workstation PCs contain CE, UL, and FCC labeling.

4.3 Software System Functions

The Dominion Democracy Suite 4.14 System software is written in the C, C++, C# (C Sharp) programming languages. The system software is broken into three areas: EMS, Precinct tabulator software acting as firmware, and central count application running on a COTS workstation.

The Democracy Suite EMS software consists of the seven components listed below:

- Election Event Designer
- Results Tally and Reporting
- Audio Studio
- Datacenter Manager
- Application Server
- Network Attached Storage Server
- Database Server

The Democracy Suite 4.14 contains two precinct tabulators. Both tabulators run software that is treated as firmware. The software applications are ICP and ICE. The Democracy Suite 4.14 has an independent workstation running proprietary software. The ICC application provides the central tabulation function for the system.

4.4 Test Case Design

Wyle uses the V-Model Life Cycle as defined by the Institute of Electrical and Electronics Engineers (IEEE). The IEEE definition of the V-Model Life Cycle uses two concepts "Verification" and "Validation". Wyle's test approach is to use both "Verification" and "Validation" to some degree. There are four basic levels of testing in the V-Model Life Cycle: Component, Integration, System, and Acceptance. Wyle will be evaluating the Dominion Democracy Suite 4.14 to all four levels.

4.4.1 Hardware Qualitative Examination Design

ICP Testing

A PCA and quick scan was performed on the ICP component to verify the changes and effects caused by the changes to the unit therefore no additional hardware testing will be required based on the findings of the evaluation. Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the Democracy Suite 4.0 approved certification testing (EAC CERTIFICATION NUMBER – DVS-40-G). Wyle will be utilizing the data obtained during that test effort to satisfy requirements for this modification test campaign.

The summary of acceptable testing is provided in the table below. The details of those tests are presented in Section 6.0.

Table 4-2 ICP Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Usability/3.1	Measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users	ICP	Accept
Accessibility/3.2	Tests the voting system to ensure accessibility for individuals with disabilities to include, but not limited to visually impaired voters by providing the same access and participation opportunity.	ICP	Accept
Security/7	Tests the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified.	ICP	Accept
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	ICP	Accept
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	ICP	Accept
Safety/4.3.8	UL 60950-1 product safety review	ICP	Accept*
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	ICP	Accept
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	ICP	Wyle 7/13/12
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	ICP	Accept
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	ICP	Accept
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	ICP	Accept
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4 degrees F	ICP	Accept

4.0 TEST SPECIFICATIONS (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Table 4-2 ICP Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	ICP	Accept
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	ICP	Accept
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	ICP	Accept
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	ICP	Accept
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (1995-01)	ICP	Accept
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	ICP	Accept
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	ICP	Accept
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	ICP	Accept
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	ICP	Accept

*Safety testing was witnessed by Wyle at a third party laboratory

ICE Testing

The Dominion Democracy Suite 4.14 ICE hardware will be tested by the Wyle Laboratories' EMI, Dynamics, and Environmental test facilities for testing to the hardware requirements in accordance with Wyle Laboratories A2LA certifications 845.01-.03. All EMI testing will be performed per the following Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' Test Guidelines for Performing Electromagnetic Interference (EMI) Testing", and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products". These proprietary documents shall be submitted under separate cover for reference. All hardware testing will be performed per the guidelines of ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements", and ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" and the governing MIL-STD to which the test is required. All pre-voting and post-voting tests will be conducted by Wyle qualified personnel at the Wyle Huntsville, AL facility.

A PCA and quick scan was performed on the ICE component to verify the changes and effects caused by the changes to the unit. Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the Democracy Suite 4.0 approved certification testing (EAC CERTIFICATION NUMBER – DVS-40-G). Wyle will be utilizing a portion of the data obtained during that test effort to satisfy requirements for this modification test campaign. Additional testing as documented in table 4-3 will be required based on the introduction of a new plastic ballot box.

The summary of acceptable testing is provided in the table below. The details of those tests are presented in Section 6.0.

4.0 TEST SPECIFICATIONS (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Table 4-3 ICE Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Usability/3.1	Measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users	ICE	Reject
Accessibility/3.2	Tests the voting system to ensure accessibility for individuals with disabilities to include, but not limited to visually impaired voters by providing the same access and participation opportunity.	ICE	Reject
Security/7	Tests the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified.	ICE	Reject
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	ICE	Accept
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	ICE	Accept
Safety/4.3.8	UL 60950-1 product safety review	ICE	Accept*
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	ICE	Accept
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	ICE	Wyle 7/13/12
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	ICE	Accept
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	ICE	Accept
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	ICE	Accept
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4 degrees F	ICE	Accept
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4” drops on each edge totaling 24 drops	ICE	Accept
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	ICE	Accept
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	ICE	Accept

4.0 TEST SPECIFICATIONS (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Table 4-3 ICE Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	ICE	Accept
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (1995-01)	ICE	Accept
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	ICE	Accept
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	ICE	Accept
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	ICE	Accept
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	ICE	Accept

*Safety testing was witnessed by Wyle at a third party laboratory

ICC Testing

ICC - ICC consists of COTS scanners and COTS Workstation PCs. The Canon DR-X10C scanners and the Dell Inspiron One 2305 Workstation PCs contain CE, UL, and FCC labeling.

Table 4-4 ICC Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	ICC	Accept
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	ICC	Accept
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	ICC	Accept
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	ICC	Accept

4.0 TEST SPECIFICATIONS (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Support Equipment

Wyle has determined that these COTS PC/Laptops and Servers are not subject to the hardware test requirements per the EAC 2005 VVSG per "2007-05 Decision on Testing Focus and Applicability." The provided PC/Laptops documented in Section 3, Materials Required for Testing, all contain CE, UL, and FCC labeling.

4.4.2 Software Module Test Case Design and Data

Wyle implements Component Level Testing during the FCA for each component and subcomponent, exercising the functionality of each as designed and documented. Wyle will utilize limited structural-based techniques (white-box testing) mainly in the area of Source Code Review, Compliance Builds, and Security Testing and Review. Wyle will depend heavily on specification-based techniques (black-box testing) for the individual software components.

The most common specification-based techniques applied to the Dominion Voting Systems Democracy Suite 4.14 during the software testing portion of testing will be "equivalence partitioning" and "boundary value testing":

- "Equivalence partitioning" will be used to evaluate specific software functions and data entry points of the Democracy Suite for valid and invalid data during the FCA. For software functions and data entry points, an entry will be made for a valid data requirement and at least one invalid data requirement to test for normal and abnormal conditions.

- "Boundary Value Testing" will be used to evaluate specific software functions and data entry points for minimums and maximums during the FCA. For software functions and data entry points, an entry will be made for all minimum and all maximum documented requirements to test for normal and abnormal conditions. This technique will be used for numeric ranges as well as non-numeric ranges.

Wyle will document an expected result for each test. The ACCEPT/REJECT criteria at the Component Level will be based on the expected result. If the System Under Test (SUT) performs as expected, the results will be accepted. If the SUT does not perform as expected, the test will be evaluated for tester error. If it is determined there was no tester error, the test will be repeated in an attempt to reproduce the results. If the results can be reproduced and the expected results are not met, the SUT will have failed the test. If the results cannot be reproduced, the manufacturer and VSTL will determine the root cause of the error. If the root cause has been corrected and the SUT performs as expected, then the results will be accepted. If the root cause has not been corrected or the SUT still does not perform as expected, the SUT will have failed the test.

Wyle will document the error and track the error through resolution. Wyle will not move to the next level of testing until all documented errors are resolved to try and minimize errors that might occur farther along in the test campaign. Engineering analysis will be performed to determine what effect the resolution has on the component. A determination will be made whether Regression Testing will be sufficient or a complete re-test is necessary.

4.4.3 Software Functional Test Case Design and Data

Wyle implements Integration Level Testing primarily focusing on the interface between components and applications.

4.0 TEST SPECIFICATIONS (Continued)

4.4.3 Software Functional Test Case Design and Data (Continued)

The test approach to be used for the Dominion Democracy Suite 4.14 will be a bottom-up approach where the lower-level components will be tested first and then used to facilitate the testing of higher-level components. The specification-based technique used by Wyle at the Integration Level is "Use Case". The actors that have been identified to use the Dominion Democracy Suite 4.14 are the following:

- Election Administrator – the actor with responsibility of entering the election definition with translation and audio. This actor is also responsible for maintaining EMS users and the election database.
- Warehouse Technician – the actor responsible for loading the election definition onto the ICE and ICP units. This actor also runs diagnostic tests and maintains the units
- Poll Worker- the actor at the precinct location to set up and close down the ICE and ICP on Election Day.
- Voter – the actor who physically casts the ballot on Election Day.
- ADA Voter – the actor with special needs who has to vote unassisted on Election Day.
- Election Official – the actor who reports and audits the election results post-Election Day.

"Use Case" will be used during the FCA with a single pass through each component using only valid data. This pass will be considered the "Master Copy" of data to be passed between interfacing points of applications during Integration level testing. If a component downstream in the test process needs data from previous processes, the "Master Copy" of data can be used or altered to accelerate the test process.

Known tests that will utilize the "Master Copy" of data at the Integration Level are Security, Telecommunication, and Usability. During test performance, if an error occurs between data interfaces or in the process flow, an engineering analysis will be performed to determine if the error is data, process, or tester error.

The ACCEPT/REJECT criteria for Integration Level testing is whether the components and applications interface using the documented process for each actor. If there is an error interfacing between components, the error will be documented and tracked through to resolution. Engineering analysis will be performed to determine what effect the resolution has on the component. A determination will be made whether Regression Testing will be sufficient or a complete re-test is necessary.

4.4.4 System-Level Test Case Design

Wyle implements System Level testing focusing on a complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals in a configuration of the system's intended use. The Dominion Democracy Suite 4.14 is intended to support both large and small jurisdictions. Wyle's approach for Dominion Democracy Suite 4.14 will be to execute System Level Testing with a variety of elections that include various combinations of jurisdictions, parties, and ballot styles. Wyle will have three different test setup configurations for the EMS components as referenced in section 1.4.1 of this document.

Wyle will test the function of all hardware, software, and peripherals of the complete system during System Level Testing. The ACCEPT/REJECT criteria for System Level testing is whether the system can continue in testing.

4.0 TEST SPECIFICATIONS (Continued)

4.4.4 System-Level Test Case Design (Continued)

The two scenarios are: Accept or Reject. Accept is either 1) if no errors are found, or 2) if an error is encountered, but the system continues to operate and engineering analysis determines that the root cause does not affect testing. Reject if the system is too unstable to continue or engineering analysis determines the root cause could affect further testing.

Wyle implements Acceptance Level testing focusing on all the data collected during the entire test campaign along with performing the "Trusted Build" for the system. All data from pre-testing, hardware testing, software testing, functional testing, security testing, telecommunication testing, usability testing, accessibility testing, and reliability testing activities will be combined to ensure all requirements that are supported by the Dominion Democracy Suite 4.14 in the EAC 2005 VVSG have been tested. All requirements will be checked against the test data to ensure the EAC 2005 VVSG requirements are met. Items not supported by Dominion Democracy Suite 4.14 will be documented. Any issues documented during testing will be resolved or annotated in the test report.

Wyle will report all issues discovered during this test campaign to the EAC. The EAC has the final determination on whether the system meets all the requirements for an EAC certified system. The ACCEPT/REJECT criteria for Acceptance Level testing is whether or not the data for the test campaign supports a recommendation for certification by the EAC. If Wyle determines there is not enough data to ensure a requirement was met, the test plan will be altered and further testing will be done.

4.5 Security Functions

The purpose of the security testing will be to evaluate the effectiveness of the Democracy Suite in detecting, preventing, logging, reporting, and recovering from any security risks identified by simulating attacks on the system. To accomplish this, Wyle has developed internal operating procedures to evaluate the Dominion Democracy Suite 4.14 to the security requirements set forth in the EAC 2005 VVSG.

These procedures have been specifically tailored to assess the Dominion Democracy Suite 4.14 to the applicable requirements. Wyle will attempt to defeat the access controls and physical security measures documented in the Dominion technical data package. A threat matrix will be created to determine the risks and vulnerabilities. Wyle will utilize a combination of functional testing and source code review to evaluate the Democracy Suite 4.14 Voting System. Wyle's strategy for evaluating the Democracy Suite will be to utilize the Express Hardware Configuration and the Standard Hardware Configuration.

The following areas are not applicable to the Democracy Suite 4.14 and are therefore not included in the scope of the security testing:

- Use of Public Networks
- Wireless Communication

Wyle will report all issues discovered during this test campaign to Dominion and the EAC. A report containing all findings shall be issued to the EAC as an addendum to the final test report.

4.6 TDP Evaluation

Wyle qualified personnel will perform a comprehensive review of the Dominion TDP to determine compliance to the EAC 2005 VVSG requirements and Dominion-specific requirements.

4.0 TEST SPECIFICATIONS (Continued)

4.6 TDP Evaluation (Continued)

Wyle qualified personnel utilize a TDP Review Matrix which lists every EAC 2005 VVSG requirement pertaining to TDP review. Wyle qualified personnel will record the results of the review of each document to the applicable requirements listed in the TDP Review Matrix.

During the TDP review process, each document will be reviewed for completeness, clarity, and correctness, and continuity between the TDP documents. The review results will be formally reported to Dominion for resolution. If a revised document is received, it will be re-reviewed as discussed in this section. The TDP will be continued to be reviewed during the entire testing process as these documents will be utilized to set up the systems, verify correct operational results and numerous other tests. At the end of the TDP review process, an Anomaly Report will be issued listing the non-compliant items on a document-by-document basis, if applicable.

A listing of all documents contained in the Dominion Democracy Suite 4.14 System TDP is provided in Table 4-5.

Democracy Suite System Configuration Overview	All	1.2.0::261	5/17/13	2.02
System Security Specification	All	1.1.0::326	5/17/13	2.06
Configuration Management Process	All	1.2.0::177	4/9/13	2.11
Quality Assurance Program	All	1.2.0::80	10/16/12	2.12
System Test and Verification	All	1.1.0::104	10/16/12	2.07
System Test and Verification Suites	All	2.0.0::1	2/27/13	2.07
Democracy Suite Readiness Test Procedure	All	1.2.0::95	9/25/12	2.07
Personnel Deployment and Training Requirements	All	1.1.0::53	4/9/13	2.10
Documents describing functionality, hardware, software design, maintenance, and operation:				
EMS Functionality Description	EMS	1.1.0::227	10/16/12	2.03
ICE Functionality Description	ICE	1.2.0::70	3/27/13	2.03
ICP Functionality Description	ICP	1.1.0::109	10/16/12	2.03
ICC Functionality Description	ICC	1.1.0::63	4/9/13	2.03
ICE System Hardware Specification	ICE	1.2.0::281	4/1/13	2.04
ICP System Hardware Specification	ICP	1.1.0::81	3/28/13	2.04
ICE System Hardware Characteristics	ICE	1.2.0::84	10/16/12	2.04
ICP System Hardware Characteristics	ICP	1.1.0::44	10/16/12	2.04
EMS Software Design and Specification	EMS	1.0.0::207	2/19/13	2.05
ICE Software Design and Specification	ICE	1.0.0::102	2/12/13	2.05
ICP Software Design and Specification	ICP	1.1.0::101	10/16/12	2.05
ICC Software Design and Specification	ICC	1.0.0::34	11/30/12	2.05
ICP System Operation Procedures	ICP	1.1.0::169	3/18/13	2.08
EMS System Operation Procedures	EMS	1.2.0::448	3/27/13	2.08
ICE System Operation Procedures	ICE	1.0.0::120	4/19/13	2.08
ICC System Operation Procedures	ICC	1.1.0::103	5/15/13	2.08
ICP System Maintenance Manual	ICP	1.1.0::66	10/16/12	2.09

Table 4-5 Democracy Suite 4.14 TDP Documents

4.0 TEST SPECIFICATIONS (Continued)

4.6 TDP Evaluation (Continued)

Table 4-5 Democracy Suite 4.14 TDP Documents (Continued)

ICE System Maintenance Manual	ICE	1.1.0::115	10/16/12	2.09
EMS Election Event Designer User's Guide	EMS	1.0.1::154	5/16/13	N/A
EMS Results Tally & Reporting User's Guide	EMS	1.0.0::91	5/16/13	N/A
EMS Audio Studio User's Manual	EMS	1.0.0::24	10/16/12	N/A
ICP Approved Parts List	ICP	Rev: 20	7/10/12	N/A
ImageCast Precinct Device Configuration Files	ICP	2.3.3	7/27/12	N/A
ImageCast Precinct Election Definition Files	ICP	1.0.0::9	9/25/12	N/A
ImageCast Precinct Firmware Build and Install	ICP	4.2.14	9/3/12	N/A
ImageCast Precinct Firmware Update Procedure	ICP	1.0.0::12	2/11/13	N/A
ImageCast Precinct Technical Guide	ICP	1.0.0::9	7/27/12	N/A
ICE Technical Guide	ICE	1.0.0::60	7/23/11	N/A
ICE Build Procedure	ICE	1.0.0::8	7/27/12	N/A
ICE Firmware Installation Procedure	ICE	1.0.0::26	7/27/12	N/A
Engineering Product and Development Processes	ICP	P.03	7/13/12	N/A
Dominion Voting C C++ Coding Standard	All	Rev: 20	7/10/12	N/A
Dominion Voting Usability Study	ICP	1.0.0::22	7/27/12	N/A
Dominion Voting Usability Study	ICE	3.0.6	9/25/12	N/A
ICE Build Procedure	ICE	1.0.0::44	2/11/13	N/A
ICE Firmware Installation Procedure	ICE	1.0.0::30	12/26/12	N/A
EMS System Maintenance Manual	EMS	1.0.0::50	10/16/12	2.09
ImageCast Precinct Firmware Build and Install	ICP	4.2.14	9/3/12	N/A
ImageCast Central Build Environment Setup	ICC	2.1.7::13	3/6/13	N/A
ImageCast Central Software Build Procedure	ICC	2.1.7::23	5/23/13	N/A
EMS Build Environment Procedure	EMS	2.1.0::10	5/7/13	N/A

4.7 Source Code Review

As part of the testing activities, the Dominion Democracy Suite 4.14 source code will be reviewed to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards. The review will be conducted per the guidelines described in the following paragraphs.

As the source code is received, an SHA1 hash value will be created for each source code file. The source code team will then conduct a visual scan of every line of source code for an initial review and every line of modified source code for a re-review. 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.

The initial review will include a peer-review on a 100 % of the issues within the code prior to the code being returned to the manufacturer. This shall be done to evaluate the correctness of the review and look for standards violations that may have been missed or violations that were noted in error. Any standards violations that the team concludes were recorded in error or missed are then corrected in the code review notes.

4.0 TEST SPECIFICATIONS (Continued)

4.7 Source Code Review (Continued)

A technical summary report of all identified standards violations will be sent to Dominion for resolution. Dominion will then correct all standards violations and re-submit the source code for re-review. This process will be repeated as many times as necessary, until all identified standards violations are corrected.

All reports will be included in an anomaly report for source code and submitted to the EAC and included in the final test report.

Dominion Voting Systems uses an auto-feed option designed in the system to repetitively feed ballots in and out of the scanner. This feature is documented as "Auto-Feed" mode or "Shoe Shine" mode. As part of the source code review this function will be inspected in detail to meet the requirements of EAC 2005 VVSG Volume 1 Section 2.2.4 g and h. The final step will be to create a "Trusted Build" from the reviewed source code. The "Trusted Build" will be performed by completing the following tasks in the order listed:

- 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 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.

4.8 QA and CM System Review

The Dominion QA Plan and CM Plan will be reviewed to determine compliance with EAC 2005 VVSG Volume II Section 2, and Volume I Sections 8 and 9, with EAC stated requirements, and with the requirements of the internal Dominion documentation.

Also, the Dominion TDP documentation package will be reviewed to determine if the Dominion QA Plan and the CM Plan are being followed. The results of the TDP review will be entered on a spreadsheet as previously described in Section 4.6 TDP Evaluation of this test plan. The results of the TDP review, including the QA and CM compliance results, will also be included in the final Test Report.

5.0 TEST DATA

5.1 Test Data Recording

All equipment utilized for test data recording shall be identified in the test data package. For hardware environmental and operational testing, the equipment will be listed on the Instrumentation Equipment Sheet for each test. The output test data will be recorded in an appropriate manner as to allow for data analysis.

For source code and TDP reviews, results will be compiled in output reports and discrepancies submitted to Dominion Voting Systems for resolution. Additionally, all test results, including functional test data, will be recorded on the relevant Wyle Laboratories' Operating Procedure and Test Cases. Results will also be recorded real-time in engineering log books.

Wyle Laboratories, Inc. will evaluate all test results against the Dominion Voting Systems provided technical documentation for the Democracy Suite 4.14 and the requirements set forth in the EAC 2005 VVSG. The Democracy Suite 4.14 shall be evaluated for its performance against the EAC 2005 VVSG. The acceptable range for system performance and the expected results for each test case shall be derived from the Democracy Suite 4.14 documentation. Per the EAC 2005 VVSG, these parameters shall encompass the test tolerances, 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, and 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).

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.

6.0 TEST PROCEDURES AND CONDITIONS

The following subsections describe test procedures and a statement of the criteria by which readiness and successful completion shall be indicated and measured.

6.1 Facility Requirements

All testing will be conducted at the Wyle Huntsville, AL facility unless otherwise annotated. Hardware environmental non-operating (storage) and operating testing will be conducted utilizing an adequately sized environmental test chamber or dynamic vibration (shaker) system equipped with the required data gathering support equipment. All remaining operating hardware tests will be conducted at the appropriate test site with the required support equipment. All instrumentation, measuring, and test equipment used in the performance

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.1 Facility Requirements (Continued)

of this test program will 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: 68 to 75 degrees Fahrenheit (± 4°F)
- Relative Humidity: 20 to 90%
- Atmospheric Pressure: Local Site Pressure

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

- Time ± 5%
- Temperature ± 3.6°F (2°C)
- Vibration Amplitude ± 10%
- Vibration Frequency ± 2%
- Random Vibration Acceleration
  - 20 to 500 Hertz ± 1.5 dB
  - 500 to 2000 Hertz ± 3.0 dB
- Random Overall grms ± 1.5 dB
- Acoustic Overall Sound Pressure Level +4/-2 dB

Deviations to the above tolerances may be submitted by the test responsible agency 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 Receiving Ticket (WL-218, Nov'85) and proper QA procedures. When voting system hardware is received, Wyle Shipping and Receiving personnel will notify Wyle QA personnel. With Wyle QA personnel present, each test article will 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, Inc., representative shall be notified.

Wyle 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, Inc., representative for resolution. TDP items, including all

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

manuals, and all source code modules received will be inventoried and maintained by the Wyle Project Engineer assigned to testing.

For hardware test setup, the system will be configured as would for normal field use. This includes connecting all supporting equipment and peripherals. Wyle personnel will properly configure and initialize the system, and verify that it is ready to be tested, by following the procedures detailed in the Democracy Suite 4.14 technical documentation.

Wyle will develop an operational status test to be performed prior to and immediately following each hardware test. Wyle will develop the system performance levels to be measured during operational tests.

Wyle has developed eight election definitions to be used during this test campaign.

Operational Status Check

This election definition will exercise the operational status of the Democracy Suite 4.14 System, during the operational hardware tests, and prior to and immediately following the non-operational hardware tests.

Accuracy

This test must exercise all possible voting positions for the ballot.

General Election: GEN-01

A basic election held in four precincts, one of which is a split precinct, containing nineteen contests compiled into four ballot styles. Five of the contests are in all four ballot styles. The other fifteen contests are split between at least two of the precincts with a maximum of four different contests spread across the four precincts. This election was designed to functionally test the handling of multiple ballot styles, support for at least two languages, support for common voting variations, and audio support for at least two languages.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: Yes
- Straight Party voting: Yes
- Cross-party endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

This election was designed to functionally test the handling of multiple ballot styles, support for at least two languages, support for common voting variations, and audio support for at least two languages. Test Pattern 8 was chosen for audio input in an alternative language because it is a basic voting pattern using an ADA device. Test pattern 9 was chosen for audio input to demonstrate support for write-in voting using an ADA device. Test Pattern 3 was chosen for Spanish language input because it is a basic vote pattern using Spanish. Test Pattern 10 was chosen for Spanish language input because it exercises write-in using Spanish.

General Election: GEN-02

A basic election held in three precincts. This election contains fifteen contests compiled into three ballot styles. Ten of the contests are in all three ballot styles with the other five split across the three precincts. This election was designed to functionally test the handling of multiple ballot styles, support for ballot rotation, support for two languages, support for complex voting variations, and audio support for multiple languages.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: Yes
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: Yes
- Cumulative voting: No
- Ranked order voting: Yes
- Provisional or challenged ballots: No
- Early Voting: Yes

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

This election was designed to functionally test the handling of multiple ballot styles, support for ballot rotation, support for two languages, support for complex voting variations, and audio support for multiple languages. The election will be an early voting election with at least one machine running all precincts. Voting options for overvoting and undervoting will be exercised. Ballots 7 and 16 were selected for Spanish based language input. Ballots 13 and 17 were selected for casting of ballot using the ADA Audio capability.

General Election: GEN-03
A basic election held in two precincts. This election contains eight contests compiled into two ballot styles. Four of the contests are in both ballot styles. The other four contests are split between the two precincts. This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including a character-based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including a character-based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device. Test patterns 3 and 4 were chosen for input in the Spanish language because they are a basic voting pattern with a write-in. Test patterns 5 and 6 were chosen for audio input using the Spanish language to demonstrate support for write-in voting using an ADA device

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

with an alternative language. Test pattern 7 was chosen for character-based language input because it is a basic vote pattern using Chinese.

Test pattern 8 was chosen for character-based language using an ADA device to demonstrate support for character-based ADA device support. Test pattern 9 was chosen for binary input to show support for ADA binary input device. Test pattern 10 was chosen for binary input using ADA audio deceive to show support for binary input and ADA support.

Primary Election: PRIM-01

An open primary election in two precincts, containing thirty contests compiled into five ballot styles. Each ballot style contains six contests. This election was designed to functionally test an open primary with multiple ballot styles, support for two languages, and support for common voting variations.

The parameters of this election are listed below:

- Closed Primary: Yes
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

This election designed to functionally test an open primary with multiple ballot styles, support for two languages, and support for common voting variations. Test patterns 5 and 18 are input in an alternative language. Test patterns 8 and 18 are input using an ADA audio device. These patterns were select to exercise the write-in functionality in a primary election.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-03

A basic election held in two precincts. This election contains ten contests and is compiled into two ballot styles. Two of the contests are in both ballot styles. The other eight contests are split between the two parties ballots. This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including an Ideographic based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device.

The parameters of this election are listed below:

- Closed Primary: Yes
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including an Ideographic based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device. Test patterns 3 and 4 were chosen for input in the Spanish language because it is a basic voting pattern with a write-in. Test patterns 5 and 6 were chosen for audio input using the Spanish language to demonstrate support for write-in voting using an ADA device with and alternative language. Test pattern 7 was chosen for Ideographic based language input because it is a basic vote pattern using Chinese. Test pattern 8 was chosen for character based language using an ADA device to demonstrate support for Ideographic based ADA device support. Test pattern 9 was chosen for binary input to show support for ADA binary input device. Test pattern 10 was chosen for binary input using ADA audio deceive to show support for binary input and ADA support.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence

The ICE component of the Democracy Suite 4.14 underwent a PCA and quick scan to verify the changes and effects caused by the changes to the unit. No additional testing will be required based on the findings of the evaluation. There is not a required sequence for the tests to be performed and only the tests utilized during the quick scan shall be listed. The following sections provide a brief description of the each quick scan test:

6.3.1 Hardware Test Description

Hardware tests are divided into two categories: Non-Operating and Operating. The Non-Operating tests are intended to simulate the storage and transport of equipment between the storage facility and the polling location. The Operating tests are intended to simulate conditions that the EUT may encounter during operation. Prior to and immediately following Operating test, the EUT will be subjected to an operational status check.

The Operating tests included the following:

Electromagnetic Radiation (emissions) – This test verifies that radiated and conducted emissions from the voting system hardware do not exceed the allowable limits of Title 47CFR, Part 15, Class B. The test for electromagnetic radiation shall be conducted in compliance with the FCC Part 15 Class B requirements by testing per ANSI C63.4 (Volume II, Section 4.8.b).

This test was completed on the ICP and ICE tabulators. The purpose was to ensure radiated emissions were not negatively affected as a result of the hardware modifications introduced for the current test campaign. The results of this test were compared to the baseline results produced during the original Democracy Suite 4.0 test campaign, and indicated that the radiated emissions for both tabulators were lower than the baseline emissions. The successful results of this test were the determining factor for Wyle to accept additional previous hardware tests conducted on the tabulators.

6.3.2 Software Test Description

The software tests include the following:

Source Code Compliance Review – Wyle Laboratories personnel will compare the source code to the manufacturer's software design documentation to ascertain how completely the software conforms to the manufacturer's specifications. A listing of the TDP documents for Software Design and Specification can be found in Table 4-5 of this document. Source code inspection shall also assess the extent to which the code adheres to the requirements in Section 5 of Volumes I and II.

Compliance Build of the Democracy 4.14 System Software, Firmware, and Utilities– Before testing can begin a compliance build of all the applications will be constructed by Wyle personnel using the build environment, build documentation and reviewed source code. This is to ensure the software being tested is constructed from the same source code that was reviewed.

COTS Source Code Review – Unmodified, general purpose COTS non-voting software (e.g., operating systems, programming language compilers, data base management systems, and Web browsers) is not subject to the detailed examinations specified in this section.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.2 Software Test Description (Continued)

However, Wyle Laboratories personnel will examine such software to confirm the specific version of software being used against the design specification to confirm that the software has not been modified. Wyle will verify by downloading the software directly from the manufacturer site, verifying against NRSL, or by being provided original OEM discs.

Portions of COTS software that have been modified by the manufacturer in any manner are subject to review. Unmodified COTS software is not subject to code examination. However, source code generated by a COTS package and embedded in software modules for compilation or interpretation will be provided in human readable form to Wyle Laboratories. Wyle Laboratories personnel may inspect COTS source code units to determine testing requirements or to verify the code is unmodified.

Wyle Laboratories may inspect the COTS generated software source code in preparation of test plans and to provide some minimal scanning or sampling to check for embedded code or unauthorized changes. Otherwise, the COTS source code is not subject to the full code review and testing. For purposes of code analysis, the COTS units shall be treated as unexpanded macros, as per Volume II, Section 5.2 of the EAC 2005 VVSG.

Baseline of EMS Operating and Build Machine OS – Wyle will review the submitted NIST SCAP FDCC checklist for the EMS Operating System and Build Machine OS Dominion. The review will be performed for completeness, clarity, and consistency.

Error Recovery Test – This will be tested to ensure that unit is capable of recovering from a non- catastrophic failure of a device, or from any error or malfunction that is within the operator's ability to correct and restore the device gracefully from the failures. Testing will include powering units off while operating, disconnecting various cables and components to ensure operation once restored.

Security Source Code Review – The security source code review is a detailed review of the functionality of the source code that has been submitted. A manual line by line review of the source code will be performed.

Trusted Build – The trusted build is a process of converting the reviewed source code into machine-readable binary instructions for a computer. This test will follow Section 5.6 of the EAC Testing and Certification Program manual.

Table 6-1 Democracy Suite 4.14 System Software Test Sequence

Test	Description	Procedure	Test Level	Specimen
Compliance Source Code Review	Source code review for compliance	WHVS07.2 WOP 5a	Component	Democracy Suite 4.14 Source Code Package

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.2 Software Test Description (Continued)

Table 6-1 Democracy Suite 4.14 System Software Test Sequence (Continued)

Compliance Build	Using the build documents and source code to construct the EMS	WHVS07.3 WOP 7b	Component	Democracy Suite 4.14
Source Code COTS Review	Source code review to examine 3rd party products for modification and versions	WHVS07.2 WOP 5d	Component	Democracy Suite 4.14 Source Code Package
Baseline OS	RFI 2008-03 OS Configuration	WHVS07.3 WOP 25	Component	Democracy Suite 4.14
Source Code Functional Review	Source code review for functionality and high level software design	WHVS07.2 WOP5b	Component & Integration	Democracy Suite 4.14 Source Code Package
Source Code Security Review (manual)	Source code review for specific security concerns	WHVS07.2 WOP5c WOP 6a	Component & Integration	Democracy Suite 4.14 Source Code Package

6.3.3 System Testing

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
- 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

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

Functional Configuration Audit – The functional configuration audit encompasses an examination of manufacturer's tests, and the conduct of additional tests, to verify that the system hardware and software perform all the functions described in the manufacturer's documentation submitted for the TDP. In addition to functioning according to the manufacturer's documentation, tests shall be conducted to ensure all applicable EAC 2005 VVSG requirements are met. This testing is accomplished through a process called sequencing.

Sequencing is the act of navigating through the user interface to verify that the system performs as described by the manufacturer and does not violate any of the VVSG requirements. The path that the tester navigates follows the logical flow of accomplishing task required to conduct an election or otherwise exercise a function. For example, a task in conducting an election is to add a candidate. The tester will follow the flow of the user interface to add the candidate to a contest. If there are multiple ways to achieve this, then each method will be tested. This process will continue until all tasks for conducting an election are completed. Any paths, or combination of paths, that are determined to be at risk for failure that are outside of the normal flow of the interface will be tested on an individual basis.

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.

Security Test – The security test is designed and performed to test the capabilities of the voting system against the requirements defined in Volume I Section 7. These procedures shall focus on the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified. This test will also examine system capabilities and safeguards claimed by Dominion in the TDP to go beyond these risks. The range of risks tested is determined by the design of the system and potential exposure to risk.

Telecommunication Test – The telecommunication test focuses on system hardware and software function and performance for the transmission of data that is used to operate the system and report election results. This test applies to the requirements for Volume I, Section 6 of the EAC 2005 VVSG.

Usability – The usability test is a measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users with a given product in the performance of specified tasks. This test applies to the requirements for Volume I, Section 3 of the EAC 2005 VVSG.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

Accuracy – The accuracy test ensures that each component of the voting system (ICC, ICE and ICP) can each process 1,549,703 consecutive ballot positions correctly within the allowable target error rate. The Accuracy test is designed to test the ability of the system to "capture, record, store, consolidate and report" specific selections and absences of a selection. The required accuracy is defined as an error rate. This rate is the maximum number of errors allowed while processing a specified volume of data.

For paper-based voting systems the ballot positions on a paper ballot must be scanned to detect selections for individual candidates and contests and the conversion of those selections detected on the paper ballot converted into digital data.

In an effort to achieve this and to verify the proper functionality of the units under test the following methods will be used to test each component of the voting system:

The Accuracy test requirements for the ICE will be met by the execution of two accuracy tests, in keeping with the Accuracy test philosophy utilized on the Democracy Suite 4.0 test campaign. Since Wyle considers the ICE as both a paper based scanner and a ballot marker, the first accuracy test for the ICE will be performed by using both paper-based and audio ballots. The majority of the vote processing will be utilizing the paper-based functionality, while audio votes are being cast at defined intervals between ballot scans. After analyzing the processes and researching past testing, Wyle believes the architecture, data flow, and integration of the recording process of an audio ballot and the scanning of a paper ballot in an ICE unit are similar and use many of the same software modules. Based on this, Wyle has concluded that the audio feature should not be subjected to the full requirement of Volume II, Section 4.7.1.1; therefore during test performance, 5000 audio ballot positions will be cast to satisfy the execution of the feature. The remaining ballot positions will be captured with paper-based voting. All results will be validated and verified against the election definition voting matrix for expected results.

If the ICE processes the minimum number of ballot positions without error, the test shall be accepted. If the ICE should not process the minimum requirement, an evaluation will be performed to determine the root cause and the test will not be accepted.

The second accuracy test will consist of the ICE Ballot Marking Device (BMD). Wyle will utilize a maximum position ballot with the ICE, which will be manually voted in order to verify the components correctly tabulate 1,549,703 ballot positions within the allowable target error rate. All results will be validated and verified against the election definition voting matrix for expected results. If the ICE processes the minimum number of ballot positions, during both tests, without error the test shall be accepted. If the ICE should not process the minimum requirement an evaluation will be performed to determine the root cause and the test will not be accepted.

ICC accuracy will be exercised by using only paper-based ballots. All results will be validated and verified against the election definition voting matrix for expected results. If the ICC processes the minimum number of ballot positions without error the test shall be accepted. If the ICC should not process the minimum requirement an evaluation will be performed to determine the root cause and the test will not be accepted.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

ICP accuracy will be executed by the use of paper-based ballots and audio voting sessions. The majority of the vote processing will be utilizing the paper-based functionality, while audio votes are being cast at defined intervals between ballot scans. After analyzing the processes and researching past testing, Wyle believes the architecture, data flow, and integration of the recording process of an audio ballot and the scanning of a paper ballot in an ICP unit are similar and use many of the same software modules.

Based on this, Wyle has concluded that the audio feature should not be subjected to the full requirement of Volume II, Section 4.7.1.1; therefore during test performance, 5000 audio ballot positions will be cast to satisfy the execution of the feature. The remaining ballot positions will be captured with paper-based voting. All results will be validated and verified against the election definition voting matrix for expected results. If the ICP processes the minimum number of ballot positions without error the test shall be accepted. If the ICP should not process the minimum requirement an evaluation will be performed to determine the root cause and the test will not be accepted.

System Integration – System Level certification test address the integrated operation of both hardware and software, along with any telecommunication capabilities. Compatibility of the voting system software components or subsystems with one another, and with other components of the voting system environment, shall be determined through functional tests integrating the voting system software with the remainder of the system. The ICE and ICP will include both hand marked ballots and ballots created by the ADA input devices (Sip & Puff, Foot Pedals, and ATI).

The ICE will also include ballots that are marked by the ballot marking device (BMD) in which the marked ballots will then be utilized to create the test deck for the ICC system integration test. The use of the BMD marked ballots shall allow the system to utilize all ballot creation styles and produce the same expected outcome during the execution of the test.

Appendix B describes additional capabilities associated to the Dominion Democracy Suite system 4.14. These will be tested during System Testing as needed.

Regression Testing

Regression Testing will be performed on all applicable system components to verify all firmware and application software modifications.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

Table 6-2 Democracy 4.14 System Testing Sequence

Test	Description	Procedure	Test Level	Specimen	Election Data	Re-Use from Previous VSTL Testing
Technical Data Package (TDP) Review	Documentation review for compliance, correctness, and completeness	WHVS07.1 WOP 3	Document	TDP package	---	N/A
Physical Configuration Audit	Audit hardware and software models and versions	WHVS07.3 WOP 25	Component & System	System hardware and software	---	N/A
Functional Configuration Audit	Functional testing to the system documentation and EAC 2005 VVSG requirements	WHVS07.4 WOP 26 WOP30a	Component & Integration	System	Gen-01 Prim-01	Yes
Telecommunication	Test of telecommunication technology of the system for accuracy and correctness	WHVS07.6 WOP 31	Integration & System	System	Gen-01	N/A
Usability/ Accessibility	Testing to the system documentation and EAC 2005 VVSG requirements	WOP 24-2d	Integration	System	Gen-01 Prim-01	N/A
Volume, Stress, & Reliability Test	Test to investigate the system's response to larger amounts of data than it is expecting.	WOP 21 WOP 30	System	System	Volume and Stress Election	Yes

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

Table 6-2 Democracy 4.14 System Testing Sequence

Security	Assess the system to the 2005 VVSG requirements and execute basic system security tests.	WHVS07.7 WOP 6 WOP 6a WOP 6b WOP 6c WOP 6d	Integration & System	System	Gen-01 Prim -01	N/A
Logic and Accuracy	Test of accuracy to ~1.6 million ballot positions per system component (ICC, ICE, and ICP)	WHVS07.9 WOP 30 WOP 21	System	System	L&A Election	N/A
System Integration Test	Test of all system hardware, software and peripherals.	WOP 30	System	System	Gen-01-03 Prim-01&03	N/A
Trusted Build	Creation and installation of the final system software	WHVS07.6 WOP 7 WOP 7a	Component	System software	Democracy Suite 4.14 Source Code Package	N/A

7.0 TEST OPERATIONS PROCEDURES

7.1 Proprietary Data

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

APPENDIX A

DOMINION PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors
1	EAC Application	0 days	Tue 5/1/12	Tue 5/1/12	
2	EAC Kickoff Meeting	3 days	Mon 5/21/12	Thu 5/24/12	
3	**Technical Data Package Review**	**185 days**	**Mon 7/16/12**	**Mon 4/1/13**	
4	Partial Document Submission	3 days	Mon 7/16/12	Thu 7/19/12	
5	Document Review for VVSG Requirements	15 days	Mon 10/8/12	Mon 10/29/12	
6	Document Discrepancy Report	1 day	Fri 11/16/12	Fri 11/16/12	
7	Dominion Review of Report and Correct Documents	15 days	Mon 11/19/12	Mon 12/10/12	
8	Document Re-Review	5 days	Tue 12/11/12	Tue 12/18/12	
9	Document Accepted	1 day	Tue 12/18/12	Wed 12/19/12	
10	Final TDP Review and Report	73 days	Wed 12/19/12	Mon 4/1/13	9
11	**Source Code Review**	**71 days**	**Mon 11/12/12**	**Tue 2/19/13**	
12	**EMS Source Code Review**	**67 days**	**Mon 11/12/12**	**Wed 2/13/13**	
30	**Review ICP Firmware**	**43 days**	**Thu 12/13/12**	**Tue 2/12/13**	
44	**Review ICE Firmware**	**43 days**	**Thu 12/13/12**	**Tue 2/12/13**	
59	**Review ICC Firmware**	**43 days**	**Thu 12/13/12**	**Tue 2/12/13**	
68	**Review Adjudication Source Code**	**48 days**	**Thu 12/13/12**	**Tue 2/19/13**	
82	**Test Plan**	**106 days**	**Mon 9/17/12**	**Tue 2/12/13**	
92	**Physical Configuration Audit**	**89 days**	**Mon 10/15/12**	**Thu 2/14/13**	
93	**PCA Hardware Configuration**	**5 days**	**Mon 10/15/12**	**Fri 10/19/12**	
94	PCA Initial Hardware Submitted	1 day	Mon 10/15/12	Tue 10/16/12	
95	PCA Proprietary Hardware Documentation Submitted	1 day	Mon 10/15/12	Mon 10/15/12	
96	PCA Initial Hardware Photographed	2 days	Tue 10/16/12	Thu 10/18/12	
97	Report PCA Test	2 days	Thu 10/18/12	Mon 10/22/12	96
98	**Test Case Development**	**14 days**	**Mon 1/28/13**	**Thu 2/14/13**	
99	EMS	7 days	Mon 1/28/13	Wed 2/6/13	
100	ICE	3 days	Wed 2/6/13	Mon 2/11/13	99
101	ICP	3 days	Wed 2/6/13	Mon 2/11/13	99
102	ICC	3 days	Mon 2/11/13	Thu 2/14/13	101
103	Adjudication	3 days	Tue 2/12/13	Thu 2/14/13	101
104	**Functional Configuration Audit**	**21 days**	**Fri 2/15/13**	**Fri 3/15/13**	
105	**Pre FCA Setup/Test Case Sequencing**	**1 day**	**Fri 2/15/13**	**Fri 2/15/13**	
106	EMS	1 day	Fri 2/15/13	Fri 2/15/13	98
107	ICE	1 day	Fri 2/15/13	Fri 2/15/13	98
108	ICP	1 day	Fri 2/15/13	Fri 2/15/13	98

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Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Progress
External Tasks	Duration-only	Deadline

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ID	Task Name	Duration	Start	Finish	Predecessors
109	ICC	1 day	Fri 2/15/13	Mon 2/18/13	98
110	Adjudication	1 day	Fri 2/15/13	Mon 2/18/13	98
111	**FCA Execution**	**20 days**	**Mon 2/18/13**	**Fri 3/15/13**	
112	EMS	19 days	Mon 2/18/13	Fri 3/15/13	110
113	ICE	14 days	Mon 2/18/13	Thu 3/7/13	107
114	ICP	14 days	Mon 2/18/13	Thu 3/7/13	108
115	ICC	18 days	Mon 2/18/13	Thu 3/14/13	109
116	Adjudication	19 days	Mon 2/18/13	Fri 3/15/13	110
117	**FCA Completion**	**2 days**	**Thu 3/14/13**	**Mon 3/18/13**	
118	Report FCA Test	2 days	Thu 3/14/13	Mon 3/18/13	115
119	**Usability Execution**	**2 days**	**Tue 3/5/13**	**Thu 3/7/13**	
120	Complete Usability	2 days	Tue 3/5/13	Thu 3/7/13	
121	**Hardware Testing**	**145 days**	**Fri 7/13/12**	**Thu 1/31/13**	
122	**Electrical Tests - ICP/ICE**	**1 day**	**Fri 7/13/12**	**Fri 7/13/12**	
123	EMC Quick Scan - First Pass	1 day	Fri 7/13/12	Fri 7/13/12	
124	EMC Quick Scan - Second Pass	2 days	Wed 1/30/13	Fri 2/1/13	
125	Electrical Tests Complete	1 day	Mon 7/16/12	Fri 2/1/13	123,124
126	~~Other Hardware Tests~~	~~4 days~~	~~Mon 3/25/13~~	~~Fri 3/29/13~~	
127	~~Temperature Power/Reliability~~	~~4 days~~	~~Mon 3/25/13~~	~~Fri 3/29/13~~	
128	**PCA on New ICE Units Received and Checkout**	3 days	Tue 3/12/13	Fri 3/15/13	
129	**System Level Performance Testing**	**190 days**	**Thu 8/2/12**	**Wed 4/24/13**	
130	**Accuracy Test**	**20 days**	**Mon 3/18/13**	**Fri 4/12/13**	
131	**ICP Audio**	**3 days**	**Mon 3/18/13**	**Thu 3/21/13**	
132	Load elections and setup	1 day	Mon 3/18/13	Tue 3/19/13	
133	ICP BMD Accuracy execution	2 days	Tue 3/19/13	Thu 3/21/13	132
134	**ICE BMD**	**3 days**	**Thu 3/28/13**	**Tue 4/2/13**	
135	Ballots arrive Wyle, Wyle Verification	0 days	Wed 4/17/13	Wed 4/17/13	
136	ICE BMD execution	2 days	Wed 4/17/13	Fri 4/19/13	135
137	**ICE Audio**	**1 day**	**Fri 4/5/13**	**Mon 4/8/13**	**136**
138	Ballots arrive Wyle, Wyle Verification	0 days	Thu 4/4/13	Thu 4/4/13	
139	ICE Audio execution	2.5 days	Wed 4/10/13	Fri 4/12/13	
140	**ICE / ICP / ICC Accuracy**	**6 days**	**Fri 5/3/13**	**Mon 5/13/13**	
141	Ballots arrive Wyle, Wyle Verification	0 days	Fri 5/3/13	Fri 5/3/13	
142	ICE / ICP / ICC Accuracy	5 days	Fri 5/3/13	Fri 5/10/13	141

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Task	External Milestone	Manual Summary Rollup	
Split	Inactive Task	Manual Summary	
Milestone	Inactive Milestone	Start-only	
Summary	Inactive Summary	Finish-only	
Project Summary	Manual Task	Progress	
External Tasks	Duration-only	Deadline	

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ID	Task Name	Duration	Start	Finish	Predecessors
143	**Security Test**	**183 days**	**Thu 8/2/12**	**Mon 4/15/13**	
144	**Access Controls Review (WoP 6)**	**15.94 days**	**Fri 4/12/13**	**Fri 5/3/13**	
145	Completion of Access Control Review	16 days	Fri 4/12/13	Fri 5/3/13	
146	**Security Assessment**	**3 days**	**Thu 8/2/12**	**Mon 8/6/12**	
147	Report Security Assessment	3 days	Thu 8/2/12	Mon 8/6/12	145
148	**Completion of Security Test**	**1 day**	**Mon 5/6/13**	**Mon 5/6/13**	
149	Final Report Security Assessment	1 day	Mon 5/6/13	Mon 5/6/13	145,147
150	**System Integration Testing**	**4.5 days**	**Fri 5/10/13**	**Thu 5/16/13**	
151	**GEN 01 - Contests, Candidates, Alt Language, Split Precinct, and Audio Ballot**	**1.5 days**	**Fri 5/10/13**	**Mon 5/13/13**	
152	GEN 01 Setup	0.5 days	Fri 5/10/13	Fri 5/10/13	
153	GEN 01 Execution	1 day	Fri 5/10/13	Mon 5/13/13	152
154	**GEN 02 - N of M, Recall, Ranked Order, Early Voting, Alt Language and Audio Ballot**	**1.5 days**	**Mon 5/13/13**	**Wed 5/15/13**	
155	GEN 02 Setup	0.5 days	Mon 5/13/13	Tue 5/14/13	153
156	GEN 02 Execution	1 day	Tue 5/14/13	Wed 5/15/13	155
157	**GEN 03 - Ideographic Language, Audio Ballot, and ADA Devices**	**1.5 days**	**Wed 5/15/13**	**Thu 5/16/13**	
158	GEN 03 Setup	0.5 days	Wed 5/15/13	Wed 5/15/13	156
159	GEN 03 Execution	1 day	Wed 5/15/13	Thu 5/16/13	158
160	**PRIM 01 - Closed Primary, Split Precinct, Multiple Ballot Styles, and Audio Ballot**	**1.5 days**	**Fri 5/10/13**	**Mon 5/13/13**	
161	PRIM 01 Setup	0.5 days	Fri 5/10/13	Fri 5/10/13	
162	PRIM 01 Execution	1 day	Fri 5/10/13	Mon 5/13/13	161
163	**PRIM 02 - Open Primary, Multiple Ballot Styles, Slate Voting, Cross-party Endorsement, and Audio Ballot**	**1.5 days**	**Mon 5/13/13**	**Wed 5/15/13**	
164	PRIM 02 Setup	0.5 days	Mon 5/13/13	Tue 5/14/13	162
165	PRIM 02 Execution	1 day	Tue 5/14/13	Wed 5/15/13	164
166	**PRIM 03 - Closed Primary, Ideographic Language, and ADA devices**	**1.5 days**	**Wed 5/15/13**	**Thu 5/16/13**	
167	PRIM 03 Setup	0.5 days	Wed 5/15/13	Wed 5/15/13	165
168	PRIM 03 Execution	1 day	Wed 5/15/13	Thu 5/16/13	167
169	**All Testing Activities Completed**	**3 days**	**Thu 5/16/13**	**Tue 5/21/13**	
170	Verification and compilation of all test data (Regression Testing)	3 days	Thu 5/16/13	Tue 5/21/13	11,82,92,104,1
171	**Final Trusted Build**	**7 days**	**Thu 5/2/13**	**Mon 5/13/13**	
172	Trusted Build Review and Setup Build Environments	2 days	Thu 5/2/13	Mon 5/6/13	
173	Trusted Build	2 days	Mon 5/6/13	Wed 5/8/13	172
174	Install and Verify System Build	1 day	Wed 5/8/13	Thu 5/9/13	173

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Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Progress
External Tasks	Duration-only	Deadline

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ID	Task Name	Duration	Start	Finish	Predecessors
175	Final Trusted Build Complete	0 days	Thu 5/9/13	Thu 5/9/13	174
176	Delivery of Images to EAC Repository	2 days	Thu 5/9/13	Mon 5/13/13	175
177	**Post Testing Activities**	**50 days**	**Fri 5/10/13**	**Wed 7/24/13**	
178	**Certification Report**	**50 days**	**Fri 5/10/13**	**Wed 7/24/13**	
179	Initial Draft Report	11 days	Fri 5/10/13	Tue 5/28/13	
180	Manufacturer Review	2 days	Tue 5/28/13	Thu 5/30/13	179
181	Final Test Report for Submission to EAC for Review	1 day	Thu 5/30/13	Fri 5/31/13	180
182	EAC Test Report Review	20 days	Fri 5/31/13	Fri 6/28/13	181
183	Address Comments From TR's	5 days	Fri 6/28/13	Tue 7/9/13	182
184	Submit Final Report	1 day	Tue 7/9/13	Wed 7/10/13	183
185	EAC Test Report Review	10 days	Wed 7/10/13	Wed 7/24/13	184

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Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Progress
External Tasks	Duration-only	Deadline

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APPENDIX B

TESTING TO REFLECT ADDITIONAL CAPABILITIES

1.0 Introduction

The Voluntary Voting System Guidelines (VVSG) allows for vendors to provide additional system capabilities in order to respond to the requirements of individual states. The scope of testing for these additional capabilities is defined by the vendor rather than the Election Assistance Commission's 2005 Voluntary Voting System Guidelines.

2.0 Scope of Testing

The Democracy Suite 4.14 System includes two additional applications that are excluded from EAC certification:

- Adjudication - represents a standalone module that reviews voter intent on a ballot-per-ballot basis
- Transmission - used for data transmission between the tabulators and the Election Management System

The scope for Adjudication testing includes all items listed below, while Transmission testing is limited to items 1 & 4:

1. **Source code review**
    a. Selection of programming languages
    b. Software integrity
    c. Software modularity and programming
    d. Control constructs
    e. Naming conventions
    f. Coding conventions
    g. Comment conventions

2. **Technical Data Package review**
    a. Application Hardware Requirements
    b. Application Installation Procedures
    c. Application Functionality Description

3. **Functionality Testing**
    a. Installation and Uninstallation
    b. Adding/Deleting application user accounts
    c. Transmitting election results from the Central Count server
    d. Removing a contest from adjudication
    e. Adding/Removing Write-ins
    f. Submitting a batch to tally
    g. Removing a batch from tally
    h. Reopening a ballot
    i. Producing reports
    j. General navigation throughout the application ensuring high-level error conditions are met

4. Witnessed Build

A Witnessed Build of the software will be created using Dominion's trusted build documents. The "Trusted Build" is performed by completing the following tasks in the order listed:

a. Clear hard drive of existing data
b. Retrieve the compliant source code
c. Retrieve the installation media for OS, compilers, and build software
d. Construct the build environment
e. Create digital signatures of the pre-source build environment
f. Create a disk image of the pre-source build environment
g. Load the compliant source code into the build environment
h. Create a digital signature of the post-source build environment
i. Create a disk image of the post-source build environment
j. Build the executable code
k. Create the installation media
l. Create a digital signature of the final build environment
m. Create a disk image of the final build environment
n. Create a digital signature of the installation media
o. Install executable code onto the hardware and validate the software/firmware
p. 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 "Trusted Builds" for the Dominion Democracy Suite 4.14 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.

3.0 Deliverables

The VSTL will provide a summary report for state certification authorities detailing the functionality tested, along with the functions not tested. Additionally, any functional issues identified during testing will be logged and identified in the letter. However, Dominion Voting Systems will be responsible for determining if the issues are resolved prior to releasing the application or they may choose to correct these issues and have the additional capabilities re-tested.

APPENDIX D

DEFICIENCY REPORT

Id	Status	Summary
415	resolved	Unable to apply SQL Server R2 service pack 2
426	resolved	Changes made to contests are not displayed in Preview mode after saving changes to Choice Group Templates
427	resolved	Creating Polling Place – Inconsistent behavior depending on method of inputting values: typing vs. context menu vs. keyboard shortcuts
438	resolved	ICE Unit s/n: T70251-ICE-01 will not power up
439	resolved	EMS Application Server failed to install due to SQL Reporting Service error – Documentation update
440	resolved	ICP-Audio DCF & ICE MBS - Default Audio Level Options not set to EAC standards
442	resolved	RTR 4.14.12 - Cancel Election Summary Report Export to PDF - Error Message Repeated Twice
443	resolved	RTR Application Ver. 4.14.12 - Using Stop Rendering function in Election Summary Report causes double error message
444	resolved	RTR Application Ver. 4.14.12 - "Summary for: <Districts, Poll Places, etc.>" placed above "User Defined" Election Title
445	resolved	RTR Application Ver. 4.14.12 - Statement of Votes Cast, duplicate data displayed, and Party Abbreviation displayed multiple times
446	resolved	RTR Application Ver. 4.14.12 - Cards Cast Report includes duplicate lines: <District - Total> and <District> beneath Precinct
447	resolved	RTR Application Ver. 4.14.12 - In Election Summary Report, Cross Endorsed candidate has Multiple Party Abbreviations
451	resolved	Election Data Translator - Import Error - Choices not assigned to any contest exist in Election XML - But not present in EED
452	resolved	RTR Ver. 4.14.17: Cards Cast Report-Cumulative - Total line displays twice when using Manual results with no specified precinct

Id	Status	Summary
453	resolved	ICC Ver. 4.14.1 (DRS Photoscribe) - Ballot Not Linked to Poll ID diverted to incorrect bin
454	resolved	ICE Unit screen became frozen during ICE BMD Accuracy test
461	resolved	ICE 4.14.7 - Pressing Continue button when printer runs out of paper during Zero or Results Report causes printing to restart
462	resolved	ICE Unit screen became frozen during ICE Audio Accuracy test
463	resolved	Results Transfer Manager (RTM) available for installation but not part of EAC 4.14 campaign
464	resolved	PhotoScribe Scanner outstacking ballots during Temp Power test
467	resolved	Election Data Translator import requires the Counting Groups External ID field to be populated. Not a required field.
471	resolved	ICE unit reported Printer Not Ready during ICE Audio Accuracy test
475	resolved	EED 4.14.21 - Attempting to Backup Election in EED fails, error message displays: "Failed to backup <Election Name> project."
486	resolved	ICP Audio for Accuracy - Tester Error
487	resolved	System Integration test on ICC reported inaccurate results for Open Primary election
488	resolved	System Integration for ICP – Tester Error
		<END OF REPORT>

APPENDIX E

ADDITIONAL STATE-LEVEL TESTING

1.0 Introduction

The Voluntary Voting System Guidelines (VVSG) allows for vendors to provide additional system capabilities in order to respond to the requirements of individual states. The scope of testing for these additional capabilities is pre-defined prior to the start of the test campaign.

2.0 Scope of Testing

Testing was conducted on the following additional components of the Democracy Suite 4.14 System:

- Adjudication - A standalone module that reviews voter intent on a ballot-per-ballot basis

- Transmission - Utilized for data transmission between the tabulators and the Election Management System

The scope for Adjudication testing included items 2.1 – 2.4, and Transmission testing included items 2.1 and 2.4:

2.1 Source code review

The Source Code Review for Adjudication and Transmission were conducted in accordance with all EAC 2005 VVSG requirements.

- Selection of programming languages
- Software integrity
- Software modularity and programming
- Control constructs
- Naming conventions
- Coding conventions
- Comment conventions

2.2. Technical Data Package review

- Application Hardware Requirements
- Application Installation Procedures
- Application Functionality Description

2.3 Functionality Testing

- Installation and Uninstallation
- Adding/Deleting application user accounts
- Transmitting election results from the Central Count server
- Removing a contest from adjudication
- Adding/Removing Write-ins
- Submitting a batch to tally
- Removing a batch from tally
- Reopening a ballot
- Producing reports
- General navigation throughout the application ensuring high-level error conditions are met

2.4 Witnessed Build

Trusted Builds of Adjudication and Transmission software were created using Dominion's Trusted Build documentation. The builds were conducted in accordance with all EAC 2005 VVSG requirements, and were performed according to the following steps:

- 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
- 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 "Trusted Builds" for the Dominion Democracy Suite 4.14 included source code, data, and script files in clear text form. Additionally, Dominion Voting Systems provided commercially available media and download links for the required COTS software. Wyle verified all COTS software by generating and subsequently verifying hash values from each software supplier. Prior to performing each build, a commercially-available software tool was used to clear each sector of the disk drives of any existing data. Afterwards, the designated Operating System was loaded, and each application was built using the previously verified source code and COTS software. The final step in the process included verifying the Adjudication application by installing it onto the EMS hardware.

3.0 Testing Results

3.1 Source Code Review

- Adjudication
    - All EAC 2005 VVSG requirements violations were resolved prior to the commencement of the Trusted Build process.
    - The Trusted Build process was successfully completed for Adjudication version **1.0.14.17603_Source_20130523**.
- Transmission
    - All EAC 2005 VVSG requirements violations were resolved prior to the commencement of the Trusted Build process.

- The Trusted Build process was successfully completed for Transmission version **2.0.3.37502_20130208**.

3.2 Technical Data Package Review

The following documents submitted for Adjudication and Transmission were confirmed to comply with the EAC 2005 VVSG requirements. The processes and procedures contained in the Adjudication documents were confirmed to successfully install, configure and test the Adjudication application. The procedures contained in the Adjudication and Transmission build documents were followed to successfully build both applications.

Democracy Suite 4.14 Adjudication Documents	Version	Date	Document Number
Adjudication Functionality Description	1.0.0::14	1/8/13	2.03
Adjudication Software Design And Specification	1.0.0::17	1/3/13	2.05
Adjudication System Operation Procedures	1.0.0::14	2/7/13	2.08
Adjudication System Maintenance Manual	1.0.0::4	01/03/13	2.09
Build.Adjudication_4.14_v0.5	0.5	5/23/13	N/A
Build Transmission_4 14_v0 3	0.3	1/30/13	N/A