

Minutes
State Election Commission Meeting
January 11, 2016

The State Election Commission meeting was called to order by Chairman Kent Younce at 12:01 p.m., Central Standard Time, January 11, 2016. The following members and staff were present: Chairman Younce; Commissioners Barrett, McDonald, Wallace and Wheeler; Coordinator of Elections Mark Goins and Kathy Summers, Elections Specialist.

Commissioner McDonald made a motion to adopt the minutes from December 1, 2015, Commissioner Wallace seconded the motion and the minutes were unanimously approved. (Aye votes: Barrett, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

Commissioner Barrett made a motion to adopt the minutes from December 1, 2015, Voting Machine Committee meeting, Commissioner McDonald seconded the motion and the minutes were unanimously approved. (Aye votes: Barrett, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

Commissioner Barrett made a motion pursuant to T.C.A. § § 2-12-101 and 2-12-106, seconded by Commissioner Wallace and unanimously approved by the Republican members to accept the Republican nomination(s) for county election commission appointments as submitted, and to leave the nomination process open until 4:30 p.m. Central Standard Time Monday, January 11, 2016. (Aye votes: Barrett, Wallace and Younce; No votes: None; Abstention: None.) **(See attached list of Republican appointments made.)**

Commissioner McDonald made a motion pursuant to T.C.A. § § 2-12-101 and 2-12-106, seconded by Commissioner Wheeler and unanimously approved by the Democratic members to accept the Democratic nomination(s) for county election commission appointments as submitted, and to leave the nomination process open until 4:30 p.m. Central Standard Time Monday, January 11, 2016. (Aye votes: McDonald and Wheeler; No votes: None; Abstention: None.) **(See attached list of Democratic appointments made.)**

Old Business

- None

New Business

- **Certify Administrators who passed the Certification Test Given on December 14, 2015** - Counties passing the test were:

County	Administrator
Cocke	Josh Blanchard
Fayette	Warren Adams
Grainger	Gina Hipsher
Henry	DeLaina Green
Johnson	Cheri Lipford
Lauderdale	Cinda Tillman
Marshall	Andrew Robertson
Weakley	Alex Britt

A motion was made by Commissioner McDonald and seconded by Commissioner Wallace to certify those passing the certification test given on December 14, 2015. The motion was unanimously approved. (Aye votes: Barrett, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

- **Request for Certification of Dominion Democracy Suite. Version 4.14 D.** Paul Terwilliger spoke on the behalf of Dominion. Mr. Terwilliger gave a PowerPoint presentation of the upgrades and provided letters of recommendations from users in other jurisdictions.

Commissioner Wheeler made a motion to approve the Dominion Democracy Suite, Version 4.14A, 4.14B and 4.14D voting machine, seconded by Commissioner McDonald and unanimously approved by all commissioners present. (Aye votes: Barrett, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

- **Request by MicroVote to view election in Indiana on May 3, 2016, to view their upgrade Infinity 4.1.** Bill Whitehead discussed the upgrade with the commission and requested the commission visit Indiana to see the upgrade to Infinity 4.1. Mr. Whitehead is also aware that letters of recommendation should be sufficient for approving the upgrade but wanted to extend the offer should commission members wish to see the machine in use

Coordinator Update

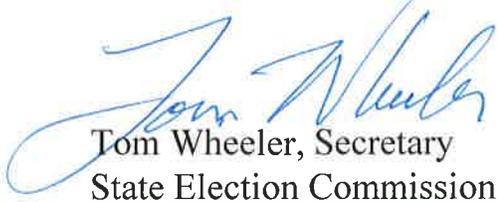
- **East TN - TACEO** – The East Tennessee Association of County Election Officials – Winter Seminar will be held in Pigeon Forge, January 12-13, 2016. Commission members are welcome to attend.
- **Legislative Breakfast** – The Tennessee Association of County Election Officials will hold their annual Legislative Breakfast at the Doubletree on March 9, 2016. All State Election Commissioners are invited and welcome to attend.

- **June Seminar** – The annual seminar will be held June 19 – 22, 2016 at Opryland Hotel.
- **Legislation Update**
 - Coordinator Goins is working on legislation and is supporting a bill to allow on line voter registration which would be coordinated through the Department of Safety.
 - Rutherford County Election Commission is working on legislation to authorize vote centers in their county.

The next regularly scheduled meeting is set for April 11, 2016, and will be held in the William R. Snodgrass – Tennessee Tower, Nashville Room - 3rd floor at 12:00 Noon Central Standard Time.

Chairman Younce adjourned the meeting.

Respectfully submitted,



Tom Wheeler, Secretary
State Election Commission

Vacant Status

08-Jan-16

Carroll

D Greg Duckett
R Jimmy Wallace

R

Coffee

D Mike McDonald
R Donna Barrett

R

Henry

D Greg Duckett
R Jimmy Wallace

D

Lewis

D Greg Duckett
R Donna Barrett

D

Overton

D Mike McDonald
R Kent Younce

D

Union

D Tom Wheeler
R Kent Younce

R

Total Vacancies: 6

Holdover Status

08-Jan-16

		Appointment	Reappointment
Fentress			
D	Tom Wheeler		
R	Kent Younce		
D	Rodney W. Foy	9/17/2002	5/13/2013
D	Yvonne McDaniel Gernt	5/9/2011	5/13/2013
Total Holdovers: 2			

New Appointment Status

11-Jan-16

		Appointment
Coffee	D Mike McDonald / R Donna Barrett R Max Lamont	1/11/2016
Overton	D Mike McDonald / R Kent Younce D Jack R. Kirby	1/11/2016
Union	D Tom Wheeler / R Kent Younce R Ricky Lyn Walker	1/11/2016
Total New Commissioners: 3		

Tre Hargett, Secretary of State

State of Tennessee



Division of Elections
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-0305

Mark Goins
Coordinator

615-741-7956
Mark.Goins@tn.gov

MEMORANDUM

To: State Election Commission Members
From: Mark Goins *Mark Goins*
Coordinator of Elections
Date: December 18, 2015
Subject: Results of the December 14, 2015 Certification Exam

On December 14, 2015, this office administered a certification exam. The following Administrators of Elections obtained a passing score on that exam:

Josh Blanchard (Cocke County)
Warren Adams (Fayette County)
Gina Hipsher (Grainger County)
DeLaina Green (Henry County)
Cheri Lipford (Johnson County)
Cinda Tillman (Lauderdale County)
Andrew Robertson (Marshall County)
Alex Britt (Weakley County)

PROCEDURES FOR CERTIFYING VOTING MACHINES BY THE TENNESSEE STATE ELECTION COMMISSION

All voting machines/vendors must receive certification from the state election commission and the coordinator of elections before any voting machines or systems may be sold in the State of Tennessee.

First Step:

Any interested vendor should submit a written request to the coordinator of elections and the state election commission requesting certification of your company together with the EAC certification number, a financial report and a list of all states that have already bought your voting machines or systems. If you would like to demonstrate your product at a meeting of the state election commission, please make that request in your letter. You will be notified of the date, time, and place of the meeting where you may make your presentation.

Second Step:

A. Voting Machine Procedure

Following verification of EAC certification and an initial presentation of your product and/or services, you would need to arrange for at least two (2) State Election Commissioners (of opposite parties) and the coordinator of elections (or designee) to view your machines or system in use in an election of a substantial size in another state. An election of a substantial size involves at the minimum the following characteristics:

- The jurisdiction has a population of at least 10,000 persons;
- The jurisdiction has at least two (2) or more district races on the ballots; and
- There are at least two (2) contested races involving both at large and district races on the ballot.

B. Voting Machine Software Systems Upgrade

- EAC Certification;
- Presentation of software upgrade before State Election Commission at a monthly meeting; and
- Viewing of upgrade in another state (In lieu of viewing machine in another state, at the discretion of the State Election Commission, letters of recommendation from users in other jurisdiction may be used as support for approval.)

C. De Minimis Voting System Changes

- Any De Minimis change to an EAC certified voting system shall be submitted to the state election commission and coordinator of elections to be approved. For purposes of approval of the de minimis change to the voting system, all that will be required is a letter from the EAC stating the change is de minimis, unless further information is requested by the state election commission or coordinator of elections.

Third Step:

The State Election Commission must vote to certify the machine in order for the machines to be used in an election in Tennessee.

You may send any correspondence for both the state election commission and the coordinator of elections to the following address:

312 Rosa L.Parks Avenue, 7th Floor
William R. Snodgrass Tower
Nashville, Tennessee 37243
(615) 741-7956

If you have any further questions regarding certification of your company, please feel free to contact the office of the state election coordinator at the phone number listed above.

Guernsey County Board of Elections

Chairman
Richard Carter, Jr.

Members
Donald D. Brown
Robert Hendershot
Joseph Miser

627 Wheeling Avenue, Suite 101
Cambridge, Ohio 43725
Phone: 740 432-2680
Fax: 740 432-6784
E-Mail: Guernsey@sos.state.oh.us

Director
Sandra K. Miller

Deputy Director
Lori A. Bamfield

December 8, 2016

Mark Goins
Coordinator of Elections
312 Rosa L. Parks Ave., 7th. Floor
William R. Snodgrass Tower
Nashville, TN 37243

Dear Coordinator Goins,

Our election jurisdiction used the Democracy Suite 4.14D in a live election event with successful results on Tuesday, November 3rd., 2015.

Based on our experience with the 4.14D software, we would recommend its use by other Dominion ImageCast customers. We are very pleased with the system, November 3rd., 2015 was our third election using the Dominion InageCast.

Should you need any additional information or wish to speak about the 4.14D upgrade, please do not hesitate to contact me via phone or email at the locations listed above.

Sincerely,



Sandra K. Miller, Director
Guernsey County Board of Elections

RECEIVED
2016 JAN 11 AM 11:09
SECRETARY OF STATE
ELECTIONS



HARRISON COUNTY BOARD OF ELECTIONS
538 N. Main St., Suite B Cadiz, Ohio 43907

Harry Edgar
John Jones
Bette Hill
Marjorie Findling, Chair

Cindy Bear, Director
Jessi Bumgardner, Deputy Director

Phone Number: (740) 942-8866
Fax Number: (740) 942-8531
Email: Harrison@ohiosecretaryofstate.gov
Website: www.electionsonthe.net

January 5, 2016

Harrison County, Cadiz, Ohio used Democracy Suite 4.14D in two elections, November 2014 and November 2015 with successful results on both General Elections.

Based on our experience with the 4.14D software, we would recommend its use by other Dominion ImageCast customers, the staff at Dominion is very efficient and helpful, with onsite support.

Should you need any additional information or wish to speak about the 4.14D upgrade, please do not hesitate to contact us via phone or email at the location listed above.

Respectfully submitted,

HARRISON COUNTY BOARD OF ELECTIONS,
Jessi Bumgardner, Deputy Director
Cindy Bear, Director

SECRETARY OF STATE
ELECTIONS

2016 JAN 11 AM 11:09

RECEIVED

THOMAS W. MCLAUGHLIN (R) CHAIR SUE S. LESCH (D) RICHARD L. STEIN (R) REESE M. WINEMAN (D)

HURON COUNTY BOARD OF ELECTIONS

SHARON E. LOCKE, DIRECTOR (D) CECILIA BLEVINS, DEPUTY DIRECTOR (R)

180 MILAN AVENUE STE 4
NORWALK, OHIO 44857

TELEPHONE: (419) 668-8238 FAX: (419) 668-8710

huron@ohiosecretaryofstate.gov www.huroncountyboe.com

November 18, 2015

Mark Goins
Coordinator of Elections
312 Rosa L. Parks Ave., 7th Floor
William R. Snodgrass Tower
Nashville, TN 37243

Dear Coordinator Goins:

Our county used Democracy Suite 4.14D in a live election on Tuesday, November 3, 2015. We were very pleased with the ease of use and great support from Dominion voting on that day and many days leading up to the election.

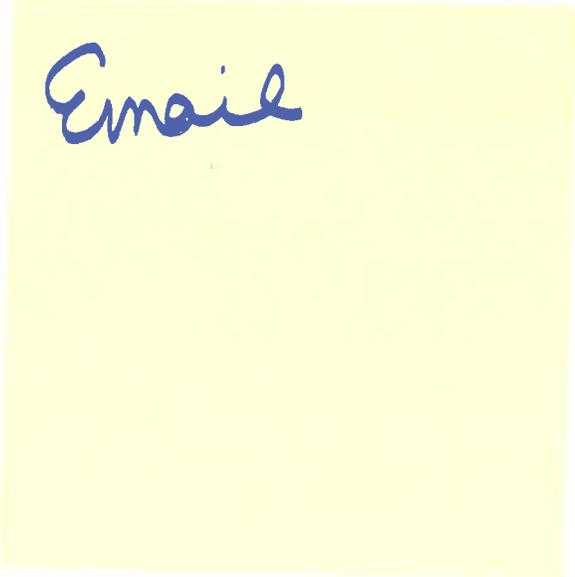
Based on our experience with the 4.14D software, I would recommend its use by other Dominion ImageCast customers.

If you have any questions or wish to speak with me regarding the 4.14D upgrade, please feel free to contact at the above phone number or by email at slocke@huroncounty.boe.com.

Sincerely,



Sharon Locke
Director



Email



**DOMINION
VOTING**

Our customers come first.

JANUARY 11, 2016

DEMOCRACY SUITE UPGRADE

For the State of Tennessee

This document is submitted in confidence and contains some or all of the following types of information: trade secrets, scientific information, financial information, technical information, commercial information, and other proprietary information. Disclosure of any of the information contained in any of the documents herein would result in undue loss to Dominion Voting Systems.

DEMOCRACY SUITE UPGRADE FOR TENNESSEE

- Tennessee previously approved Democracy Suite 4.14.
- Dominion is submitting democracy Suite 4.14-D to the state for consideration of their approval.
- Democracy Suite 4.14 EAC Certification was succeeded by the following EAC Certifications:
 - Democracy Suite 4.14-A
 - Democracy Suite 4.14-B
 - Democracy Suite 4.14-D
- Modifications between 4.14 and 4.14-D will be presented by the changes between each of the above system designations.

DEMOCRACY SUITE 4.14-A

THE DOMINION DEMOCRACY SUITE 4.14-A VOTING SYSTEM IS A MODIFICATION TO THE EAC CERTIFIED DEMOCRACY SUITE 4.14 VOTING SYSTEM.

DEMOCRACY SUITE 4.14-A INCLUDES THE FOLLOWING MODIFICATIONS:

1. Infrared (IR) paper: An optional custom paper to enhance ballot security was introduced. This paper has a special Infrared signature. A configuration setting is used to enable this feature on the ICE and ICP.
2. Introduction of Coroplast ballot boxes for ICE and ICP.

DEMOCRACY SUITE 4.14-B

THE DOMINION DEMOCRACY SUITE 4.14-B VOTING SYSTEM IS A MODIFICATION TO THE EAC CERTIFIED DEMOCRACY SUITE 4.14-A VOTING SYSTEM.

DEMOCRACY SUITE 4.14-B INCLUDES THE FOLLOWING MODIFICATIONS:

1. **Acclaimed contest behavior:** The ImageCast Evolution and ImageCast Precinct firmware has been updated to change the system's behavior when handling "acclaimed contests," during voting of an audio ballot. An acclaimed contest is a contest where the number of candidates is equal to or less than the "vote for" number.

DEMOCRACY SUITE 4.14-D

THE DOMINION DEMOCRACY SUITE 4.14-D VOTING SYSTEM IS A MODIFICATION TO THE EAC CERTIFIED DEMOCRACY SUITE 4.14-B VOTING SYSTEM

DEMOCRACY SUITE 4.14-D INCLUDES THE FOLLOWING MODIFICATIONS:

1. For the ICP Precinct Tabulator:

- a) Added support for languages without textual representation (e.g., Navajo).
- b) Added open primary including the pick-a-party variant as required for Wisconsin.
- c) Added support for open primaries including a configuration option to group per election group on the report tape.
- d) Added configuration options to format zero totals tape separate from results tape format.
- e) Improved vote casting speed for large quantities of ballots (Early Voting).

DEMOCRACY SUITE 4.14-D

2. For the ICE Precinct Tabulator:

- a) Added configuration options to report multiple write-in positions separately on zero reports and results reports and to provide total cast and total voters on the results transfer report.
- b) Added the ability to allow unit to scan and cast marked ballots while ballot selections are being made concurrently during an independent accessible voting session, using the ATI and an external display.
- c) Added additional options to the print head servicing feature: frequency of print head cleaning, and number of servicing routines in the cleaning procedure.
- d) For open primaries, added ability to respond to cross-over ballot errors. New configuration options introduced:
 - show/hide non-partisan contests on reports.
 - Show/hide elector groups on reports.
- e) For support of audio notification when voting error occurs in standard voting session, added a configuration option to enable/disable audio, and added a configuration option for volume adjustment.

DEMOCRACY SUITE 4.14-D

3. In the EMS EED (Election Event Designer) module:
 - a. Added the ability to print graphics on selected contests in the candidate cell next to the candidate name.
 - b. Added the ability to generate a printer calibration sheet.
 - c. Added the ability to render crop marks on the ballot.
 - d. Added basic control of the layout and content of write-in cells.
 - e. Extended election files for ICP with list of audio languages per ballot manifestation. Support for languages without textual representation, e.g., Audio-only languages (Navajo).
4. In the EMS RTR (Results Tally and Reporting) module:
 - a) Added the ability to manage reporting profiles.
 - b) Added ability to import/export reporting profiles.
 - c) Added ability to handle party preference contest results.
 - d) Added support for undeclared open primary voting rules.

DEMOCRACY SUITE 4.14-D

5. For the ICC Absentee tabulator:

- a) Added support for the Canon DR-G1130 scanner.
- b) Added the ability to apply open primary voting rules (e.g. Stop on cross votes).

6. Introduction of a new optional Adjudication application

Adjudication allows review of voter intent on a ballot by ballot basis from the ImageCast Central tabulator utilized during either absentee voting or post-voting activity phases.

DEMOCRACY SUITE 4-14-D

Test reports and certification documents can be found on the EAC website,
www.eac.gov, or on this page:

http://www.eac.gov/testing_and_certification/manufacturers_registered_in_the_program.aspx
#dominion





United States Election Assistance Commission



Certificate of Conformance

**Dominion Voting Democracy
Suite 4.14_A**

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 *Voluntary Voting System Guidelines (2005 VVSG)*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the *EAC Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: Democracy Suite

Model or Version: 4.14-A

Name of VSTL: Wyle Laboratories

EAC Certification Number: DemSuite-4-14-A

Date Issued: September 20, 2013

*Chief Operating Officer & Acting Executive Director
U.S. Election Assistance Commission*

Scope of Certification Attached

Manufacturer: *Dominion Voting*
System Name: *Democracy Suite 4.14-A*
Certificate: *DemSuite-4-14-A*

Laboratory: *Wyle Laboratories*
Standard: *VVSG 1.0 (2005)*
Date: *September 16, 2013*



Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

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

The Dominion Democracy Suite 4.14-A Voting System includes modifications to all components listed below.

1. Infrared (IR) paper: A new type of paper used for ballot printing was introduced. An existing software setting is responsible for paper discernment on the ICE and ICP tabulators.

2. Cable routing for ICE: A third-party manufacturing procedure was corrected where the printer board cable on the ICE tabulator was routed to clear any possible interference with internal moving parts.
3. Introduction of Coroplast Ballot Boxes for ICE and ICP.
4. Infrared (IR) Controller Board: The IR controller board firmware on the ICE tabulator was updated to version 1.00.3.

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

Election Management System

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

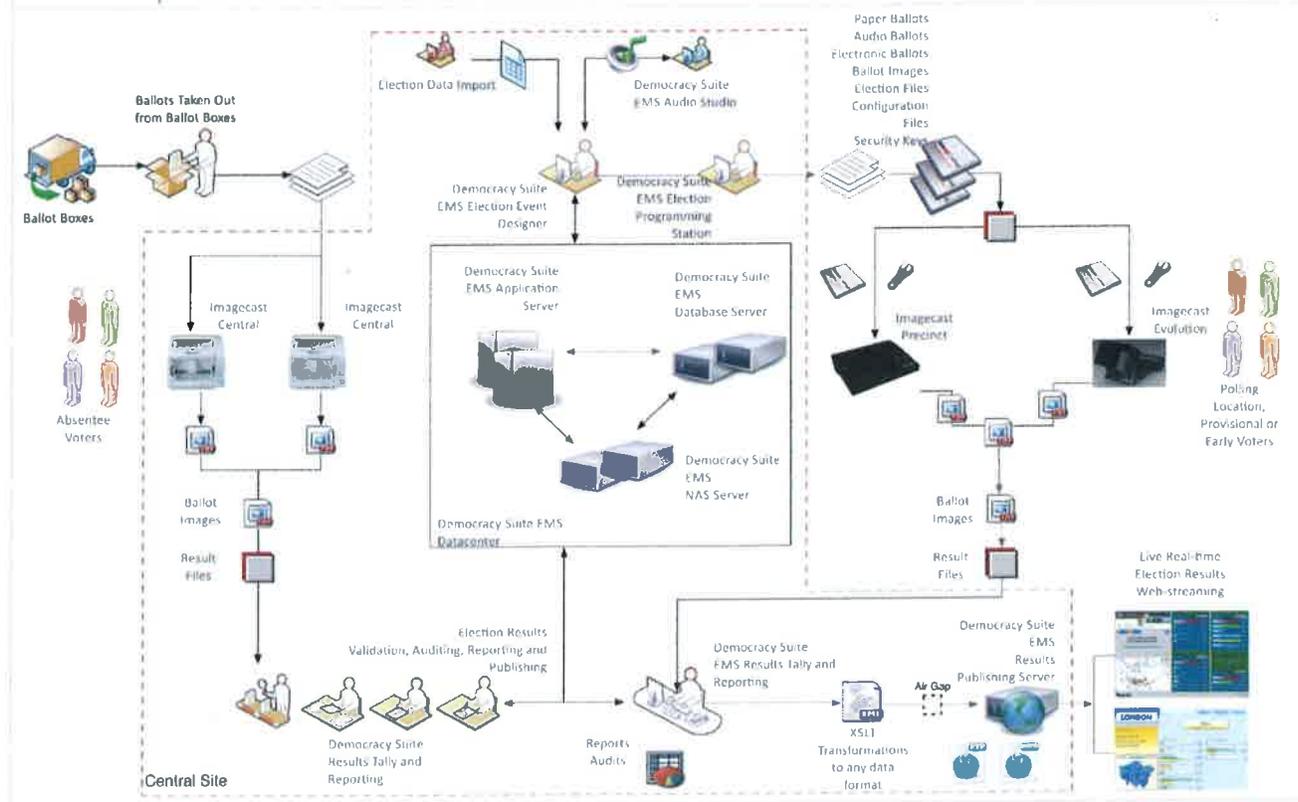
EMS Standard hardware configuration - the EMS server components were installed on a single physical server, in addition to the Local Area Network (LAN) switch devices, while the EMS client components were installed on one or more physical PCs or laptops.

All system components were interconnected in a client-server local LAN environment.

- ImageCast Evolution (ICE) precinct scanner with optional ballot marking capabilities. 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 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. The ATI can also accept input from sip and puff and other personal assistive technologies. In this sense, the ImageCast Evolution acts as a ballot marking device.
- ImageCast Precinct (ICP) precinct scanner. The ImageCast Precinct Ballot Counter is a precinct-based optical scan ballot tabulator that is used in conjunction with ImageCast compatible external ballot 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. In addition, the ImageCast Precinct supports enhanced accessibility voting which may be accomplished via an Audio Tactile Interface (ATI) connected to the ImageCast unit. The ATI can also accept input from sip and puff and other personal assistive technologies.
- ImageCast Central (ICC) central count scanner. 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.

Mark definition: 50% or more of the target area marked consistently provides mark recognition. The manufacturer recommends black ink for marking ballot selections.

Tested Marking Devices: Sharpie brand markers, black ink



Language capability: This voting system supports: Alaska Native, Aleut, Athabaskan, Chinese, English, Eskimo, Filipino, French, Japanese, Korean, Spanish, and Vietnamese. Additionally, the following Native American languages are supported: Apache, Jicarilla, Keres, Navajo, Seminole, Towa, Ute, and Yuman.

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
ImageCast Precinct	4.14.5	320A	uClinux	
ImageCast Precinct	4.14.5	320C	uClinux	
ImageCast Evolution	4.14.10	410A	Ubuntu linux	
ImageCast Central	4.14.4	Canon DR-X10C	COTS	Windows 7
Democracy Suite election management system	4.14.23	N/A (application software)	Windows Server 2008 R2	

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Server Hardware		Dell PowerEdge R610 or T610	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.4 GHz, Memory: 8x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Server Hardware		Dell PowerEdge R620 or T620	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.0 GHz, Memory: 2x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Server Hardware		Dell PowerEdge R720 or T720	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.0 GHz, Memory: 2x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Client Hardware		Dell Precision T1500	Windows 7 Professional	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB
Client Hardware		DELL Latitude e6530	Windows 7 Professional x64	Processor: Intel Core i5-3210M 2.5 GHz, Memory: 8GB 16000MHz DDR3, Hard Drive Capacity: 500GB
ICC Workstation Hardware		DELL Inspiron 2305	Windows 7 Professional x64	Processor: AMD Athlon II X2 240e2.8 GHz, Memory: 8GB Dual Channel 1333MHz DDR3, Hard Drive Capacity: 1 TB
ICC Workstation Hardware		DELL Optiplex 9010 All in One	Windows 7 Professional x64	Processor: Intel Core i7-3770 3.9 GHz, Memory: 8GB 16000MHz DDR3, Hard Drive Capacity: 500GB
ICC Workstation Hardware		DELL Optiplex 9010 All in One	Windows 7 Professional x64	Processor: Intel Core i7-3220 3.39 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500GB
NAS disk array		Rocstor Guardian 4RM	COTS	4TB or 8TB size

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Additional data storage		Rocstor Commander 2UE or Hawker HX	COTS	500GB or 1TB
iButton (SHA-1) with USB Reader/Writer		USB R/W: DS9490R# with DS1402-RP8+ iButton: DS1963S	COTS	MAXIM/Dallas Semiconductor
LCD monitor		DELL 1909W or DELL N445N or DELL 2007PF or DELL E1713S	COTS	
Audio Adapter		Soundwave 7.1 USB Audio Adapter	COTS	
PCI Software	Soundwave 7.1		COTS	
USB software	Soundwave 7.1 USB		COTS	For audio adapter
Network switch		5-Port Switch: D-Link DES-1105 or D-Link DGS-105 8-Port Switch: D-Link DGS-2208 or D-Link DGS-108	COTS	Also can use DGS-108 if 8-port needed
Mouse		Dell or Microsoft	COTS	With rollerball
Keyboard		Kensington, Microsoft, or IBM	COTS	USB enabled
Compact Flash Reader/Writer		SanDisk or GGI Gear	COTS	
Accessible Tactile Interface (ATI)		1.10		
Headphones		Sony, Cyber Acoustics, or Radio Shack	COTS	Sony MDR-G45LP; Cyber Acoustics ACM-70; Radio Shack 33-276-01
eSATA PCI card		SIIG, Inc	COTS	eSATA II PCIe Pro Card
Sip and Puff		Origin Instruments or Enabling Devices	COTS	Origin Instruments AirVoter or Enabling Devices #972
Disposable Sip and Puff Mouthpieces		Origin Instruments or Enabling Devices	COTS	Origin Instruments AC-310 or Enabling Devices #970K
Footswitch Pair		Enabling Devices	COTS	#971
Compact Flash cards		SanDisk	COTS	SanDisk SDCFAA or SDCFAB
Machine Tape rolls			COTS	Available from Dominion Voting
Tamper Evident Seals			COTS	Available from Dominion Voting
Ballot Privacy Sleeves		Various lengths to fit the ballot		Available from Dominion Voting

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Machine cleaning kit		For ImageCast Precinct, Evolution, and Central		Available from Dominion Voting

System Limitations

This table depicts the limits the system has been tested and certified to meet.

Characteristic	Limiting Component	Limit	Comment
Ballot positions	The ballot	462	Standard Configuration
Precincts in an election	EMS	1000	Standard Configuration
Contests in an election	EMS	4000	Standard Configuration
Candidates/Counters in an election	EMS	40000	Standard Configuration
Candidates/Counters in a precinct	Tabulator	462	Standard Configuration
Candidates/Counters in a tabulator	Tabulator	10000	Standard Configuration
Ballot Styles in an election	Tabulator	4000	Standard Configuration
Contests in a ballot style	Tabulator	156	Standard Configuration
Candidates in a contest	EMS	462	Standard Configuration
Ballot styles in a precinct	Tabulator	5	Standard Configuration
Number of political parties	Tabulator	30	Standard Configuration
"vote for" in a contest	Tabulator	30	Standard Configuration
Supported languages in an election	Tabulator	5	Standard Configuration
Number of write-ins	The ballot	462	Standard Configuration
Ballot positions	The ballot	462	Express Configuration
Precincts in an election	EMS	250	Express Configuration
Contests in an election	EMS	250	Express Configuration
Candidates/Counters in an election	EMS	2500	Express Configuration
Candidates/Counters in a precinct	Tabulator	462	Express Configuration
Candidates/Counters in a tabulator	EMS	2500	Express Configuration
Ballot Styles in an election	EMS	750	Express Configuration
Contests in a ballot style	Tabulator	156	Express Configuration
Candidates in a contest	EMS	231	Express Configuration
Ballot styles in a precinct	Tabulator	5	Express Configuration
Number of political parties	Tabulator	30	Express Configuration
"vote for" in a contest	Tabulator	30	Express Configuration
Supported languages in an election	Tabulator	5	Express Configuration
Number of write-ins	The ballot	462	Express Configuration

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	N/A	
Accessibility		

Feature/Characteristic	Yes/No	Comment
Forward Approach	YES	
Parallel (Side) Approach	YES	
Closed Primary		
Primary: Closed	YES	
Open Primary		
Primary: Open Standard (provide definition of how supported)	NO	
Primary: Open Blanket (provide definition of how supported)	NO	
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	YES	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	YES	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	YES	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	YES	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	YES	
Write-in Voting: Without selecting a write in position.	NO	
Write-in: With No Declared Candidates	YES	
Write-in: Identification of write-ins for resolution at central count	YES	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	YES	
Slate & Group Voting: one selection votes the slate.	YES	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	YES	Equal time rotation
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	YES	
Straight Party: Vote for each candidate individually	YES	
Straight Party: Modify straight party selections with crossover votes	YES	
Straight Party: A race without a candidate for one party	YES	
Straight Party: "N of M race (where "N">1)	YES	
Straight Party: Excludes a partisan contest from the straight party selection	YES	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	YES	
Split Precincts:		
Split Precincts: Multiple ballot styles	YES	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	YES	
Split Precincts: DRE matches voter to all applicable races.	N/A	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	YES	
Vote N of M:		
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	YES	
Vote for N of M: Invalidates all candidates in an overvote (paper)	YES	

Feature/Characteristic	Yes/No	Comment
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	YES	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2 nd contest.)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2 nd contest.)	NO	
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	NO	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	NO	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	NO	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	NO	
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	NO	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	NO	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	NO	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	YES	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	NO	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	YES	

Feature/Characteristic	Yes/No	Comment
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	YES	Overvotes cause a warning to the voter and can be configured to allow voter to override.
Overvotes: DRE: Prevented from or requires correction of overvoting.	N/A	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	YES	If allowed via voter override, overvotes are tallied separately.
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	YES	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	YES	Precinct voters receive a warning; both precinct and central scanners will warn on blank ballots.
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	YES	Blank ballots are flagged. These ballots can be manually examined and then be scanned and accepted as blank; or precinct voter can override and accept.
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	YES	Operators can examine a blank ballot, re-mark if needed and allowed, and then re-scan it.
Networking		
Wide Area Network – Use of Modems	NO	
Wide Area Network – Use of Wireless	NO	
Local Area Network – Use of TCP/IP	YES	Client/server only
Local Area Network – Use of Infrared	NO	
Local Area Network – Use of Wireless	NO	
FIPS 140-2 validated cryptographic module	YES	
Used as (if applicable):		
Precinct counting device	YES	ImageCast Precinct and Evolution
Central counting device	YES	ImageCast Central

Exclusions: For acclaimed contests, where the number of candidates is equal to or less than the “vote for” number, and where write-ins are not provided for that acclaimed contest, and only during an accessible voting session, the D-Suite 4.14 tabulator will state (through the audio

interface) that the contest is acclaimed and not allow entry into the contest. This behavior is a required feature for some of Dominion's customers, but not for some others.



United States Election Assistance Commission



Certificate of Conformance

**Dominion Voting Systems
Democracy Suite 4.14B**

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 *Voluntary Voting System Guidelines (2005 VVSG)*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the EAC *Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: Democracy Suite

Model or Version: 4.14B

Name of VSTL: Wyle Laboratories

EAC Certification Number: DVS-DemSuite4.14B

Date Issued: 1/7/2014

Chief Operating Officer & Acting Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Manufacturer: *Dominion Voting*
System Name: *Democracy Suite 4.14B*
Certificate: *DemSuite4.14B*

Laboratory: *Wyle Laboratories*
Standard: *VVSG 1.0 (2005)*
Date: *January 6, 2014*



Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

The Dominion Democracy Suite 4.14B 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 purpose of this modification is to introduce the upgrade from the EAC certified Democracy Suite 4.14 (DemSuite-4-14) and Democracy Suite (DemSuite4-14-A) to the Democracy Suite 4.14B system.

The Dominion Democracy Suite 4.14B Voting System includes the modifications listed below:

1. Acclaimed Contest Behavior: ImageCast Evolution and ImageCast Precinct application software has been updated to change the system's behavior when

handling “acclaimed contests,” during voting of an audio ballot. An Acclaimed Contest is a contest where the number of candidates is equal to or less the the “Vote For” number.

2. Engineering Change Orders (ECOs): ECOs that have been integrated into the latest production build of the ImageCast Evolution (ICE) precinct ballot and the ImageCast Evolution ballot box.

The Dominion Voting Systems Democracy Suite 4.14B System is a paper-based optical scan voting system. The certified system 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.

Election Management System

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

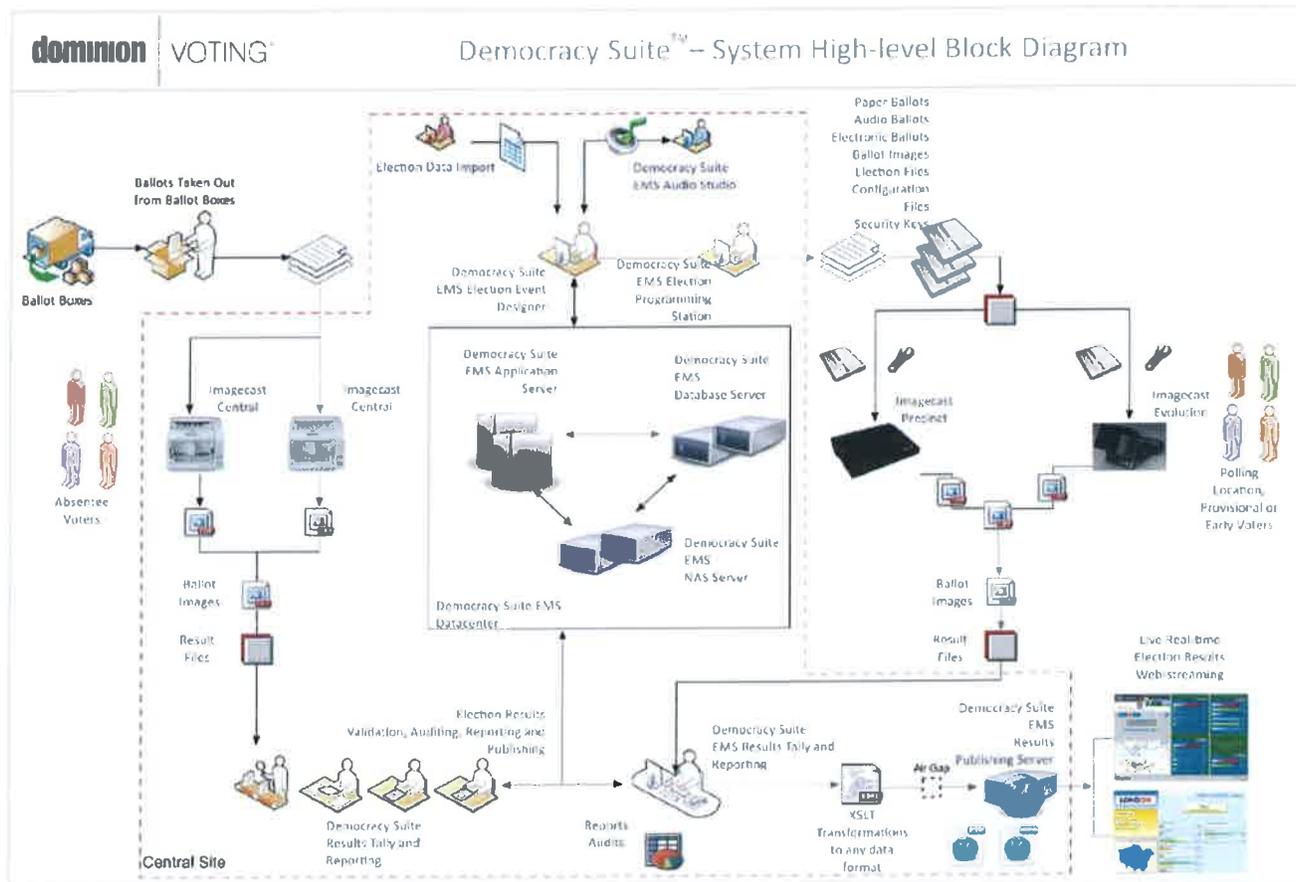
EMS Standard hardware configuration - the EMS server components were installed on a single physical server, in addition to the Local Area Network (LAN) switch devices, while the EMS client components were installed on one or more physical PCs or laptops.

All system components were interconnected in a client-server local LAN environment.

- ImageCast Evolution (ICE) precinct scanner with optional ballot marking capabilities. 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 printed on standard or secure paper stock, 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 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. The ATI can also accept input from sip and puff and other personal assistive technologies. In this sense, the ImageCast Evolution acts as a ballot marking device.
- ImageCast Precinct (ICP) precinct scanner. The ImageCast Precinct Ballot Counter is a precinct-based optical scan ballot tabulator that is used in conjunction with ImageCast compatible external ballot boxes. The system is designed to scan marked paper ballots printed on standard or secure paper stock, interpret voter marks on the paper ballot and safely store and tabulate each vote from each paper ballot. In addition, the ImageCast Precinct supports enhanced accessibility voting which may be accomplished via an Audio Tactile Interface (ATI) connected to the ImageCast unit. The ATI can also accept input from sip and puff and other personal assistive technologies.
- ImageCast Central (ICC) central count scanner. 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.

Mark definition: 50% or more of the target area marked consistently provides mark recognition. The manufacturer recommends black ink for marking ballot selections.

Tested Marking Devices: Sharpie brand markers, black ink



Language capability: This voting system supports: Alaska Native, Aleut, Athabaskan, Chinese, English, Eskimo, Filipino, French, Japanese, Korean, Spanish, and Vietnamese. Additionally, the following Native American languages are supported: Apache, Jicarilla, Keres, Navajo, Seminole, Towa, Ute, and Yuman.

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
ImageCast Precinct	4.14.9-US	320A	uClinux	
ImageCast Precinct	4.14.9-US	320C	uClinux	
ImageCast Evolution	4.14.13	410A	Ubuntu linux	
ImageCast Central	4.14.4	Canon DR-X10C	COTS	Windows 7

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Democracy Suite election management system	4.14.23	N/A (application software)	Windows Server 2008 R2	
Server Hardware		Dell PowerEdge R610 or T610	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.4 GHz, Memory: 8x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Server Hardware		Dell PowerEdge R620 or T620	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.0 GHz, Memory: 2x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Server Hardware		Dell PowerEdge R720 or T720	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.0 GHz, Memory: 2x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Client Hardware		Dell Precision T1500	Windows 7 Professional	Processor: Intel Core i7-860 2.8 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500 GB
Client Hardware		DELL Latitude e6530	Windows 7 Professional x64	Processor: Intel Core i5-3210M 2.5 GHz, Memory: 8GB 16000MHz DDR3, Hard Drive Capacity: 500GB
ICC Workstation Hardware		DELL Inspiron 2305	Windows 7 Professional x64	Processor: AMD Athlon II X2 240e2.8 GHz, Memory: 8GB Dual Channel 1333MHz DDR3, Hard Drive Capacity: 1 TB
ICC Workstation Hardware		DELL Optiplex 9010 All in One	Windows 7 Professional x64	Processor: Intel Core i7-3770 3.9 GHz, Memory: 8GB 16000MHz DDR3, Hard Drive Capacity: 500GB
ICC Workstation Hardware		DELL Optiplex 9010 All in One	Windows 7 Professional x64	Processor: Intel Core i7-3220 3.39 GHz, Memory: 4x 1GB 1333MHz DDR3, Hard Drive Capacity: 500GB
NAS disk array		Rocstor Guardian	COTS	4TB or 8TB size

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
		4RM		
Additional data storage		Rocstor Commander 2UE or Hawker HX	COTS	500GB or 1TB
iButton (SHA-1) with USB Reader/Writer		USB R/W: DS9490R# with DS1402-RP8+ iButton: DS1963S	COTS	MAXIM/Dallas Semiconductor
LCD monitor		DELL 1909W or DELL N445N or DELL 2007PF or DELL E1713S	COTS	
Audio Adapter		Soundwave 7.1 USB Audio Adapter	COTS	
PCI Software	Soundwave 7.1		COTS	
USB software	Soundwave 7.1 USB		COTS	For audio adapter
Network switch		5-Port Switch: D-Link DES-1105 or D-Link DGS-105 8-Port Switch: D-Link DGS-2208 or D-Link DGS-108	COTS	Also can use DGS-108 if 8-port needed
Mouse		Dell or Microsoft	COTS	With rollerball
Keyboard		Kensington, Microsoft, or IBM	COTS	USB enabled
Compact Flash Reader/Writer		SanDisk or GGI Gear	COTS	
Accessible Tactile Interface (ATI)		1.10		
Headphones		Sony, Cyber Acoustics, or Radio Shack	COTS	Sony MDR-G45LP; Cyber Acoustics ACM-70; Radio Shack 33-276-01
eSATA PCI card		SIIG, Inc	COTS	eSATA II PCIe Pro Card
Sip and Puff		Origin Instruments or Enabling Devices	COTS	Origin Instruments AirVoter or Enabling Devices #972
Disposable Sip and Puff Mouthpieces		Origin Instruments or Enabling Devices	COTS	Origin Instruments AC-310 or Enabling Devices #970K
Footswitch Pair		Enabling Devices	COTS	#971
Compact Flash cards		SanDisk	COTS	SanDisk SDCFAA or SDCFAB
Machine Tape rolls			COTS	Available from Dominion Voting
Tamper Evident Seals			COTS	Available from Dominion Voting
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System Limitations

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"vote for" in a contest	Tabulator	30	Standard Configuration
Supported languages in an election	Tabulator	5	Standard Configuration
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Number of political parties	Tabulator	30	Express Configuration
"vote for" in a contest	Tabulator	30	Express Configuration
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Number of write-ins	The ballot	462	Express Configuration

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	N/A	
Accessibility		

Feature/Characteristic	Yes/No	Comment
Forward Approach	YES	
Parallel (Side) Approach	YES	
Closed Primary		
Primary: Closed	YES	
Open Primary		
Primary: Open Standard (provide definition of how supported)	NO	
Primary: Open Blanket (provide definition of how supported)	NO	
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	YES	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	YES	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	YES	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	YES	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	YES	
Write-in Voting: Without selecting a write in position.	NO	
Write-in: With No Declared Candidates	YES	
Write-in: Identification of write-ins for resolution at central count	YES	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	YES	
Slate & Group Voting: one selection votes the slate.	YES	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	YES	Equal time rotation
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	YES	
Straight Party: Vote for each candidate individually	YES	
Straight Party: Modify straight party selections with crossover votes	YES	
Straight Party: A race without a candidate for one party	YES	
Straight Party: "N of M race (where "N">1)	YES	
Straight Party: Excludes a partisan contest from the straight party selection	YES	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	YES	
Split Precincts:		
Split Precincts: Multiple ballot styles	YES	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	YES	
Split Precincts: DRE matches voter to all applicable races.	N/A	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	YES	
Vote N of M:		
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	YES	
Vote for N of M: Invalidates all candidates in an overvote (paper)	YES	

Feature/Characteristic	Yes/No	Comment
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	YES	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2 nd contest.)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2 nd contest.)	NO	
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	NO	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	NO	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	NO	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	NO	
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	NO	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	NO	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	NO	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	YES	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	NO	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	YES	

Feature/Characteristic	Yes/No	Comment
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	YES	Overvotes cause a warning to the voter and can be configured to allow voter to override.
Overvotes: DRE: Prevented from or requires correction of overvoting.	N/A	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	YES	If allowed via voter override, overvotes are tallied separately.
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	YES	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	YES	Precinct voters receive a warning; both precinct and central scanners will warn on blank ballots.
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	YES	Blank ballots are flagged. These ballots can be manually examined and then be scanned and accepted as blank; or precinct voter can override and accept.
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	YES	Operators can examine a blank ballot, re-mark if needed and allowed, and then re-scan it.
Networking		
Wide Area Network – Use of Modems	NO	
Wide Area Network – Use of Wireless	NO	
Local Area Network – Use of TCP/IP	YES	Client/server only
Local Area Network – Use of Infrared	NO	
Local Area Network – Use of Wireless	NO	
FIPS 140-2 validated cryptographic module	YES	
Used as (if applicable):		
Precinct counting device	YES	ImageCast Precinct and Evolution
Central counting device	YES	ImageCast Central

Baseline Certification Engineering Change Order's (ECO)

This table depicts the ECO's certified with the voting system (please see the Test Report for additional information):

ECO#	Component	Description
n/a	ImageCast Evolution Ballot Box	Updated materials, dimensions and assembly per manufacturer recommendations.
100126	ImageCast Evolution Ballot Box	Plastic Ballot Box cable update based on first articles review. Updated tolerances based on vendor feedback.
100128	ImageCast Evolution Ballot Box	Updated design for new production run.
100138	ImageCast Evolution Ballot Box	Updated Bill of Materials.
100147	ImageCast Evolution Ballot Box	Updated Bill of Materials.
100150	ImageCast Evolution Ballot Box	Updated Bill of Materials.
100168	ImageCast Evolution Ballot Box	Released parts for production.
100169	ImageCast Evolution Ballot Box	Changed screws on Lid assembly.
100180	ImageCast Evolution Ballot Box	Updated Plastic drawings for color change on some of the plastic parts.
100077	ImageCast Evolution	Updated plastic part tools for manufacturability.
100079	ImageCast Evolution	Added alternate vendor to inductor component.
100084	ImageCast Evolution	Updated Bill of Material, documentation, and some material specifications.
100116	ImageCast Evolution	Changed sheet metal parts, removed screw from BOM, updated plastic drawings.
100121	ImageCast Evolution	Added drop-in replacement components for PCB assembly parts. Changed manufacturer for some fabricated parts (metal and transport Mylar).
100125	ImageCast Evolution	Updated remaining parts for production test procedure documents. Minor wiring harness improvements for manufacturability.
100127	ImageCast Evolution	Corrections to vendor part metadata.
100129	ImageCast Evolution	Added new Memory Module to replace part near obsolescence.
100131	ImageCast Evolution	Minor updates to plastic parts and documentation. Added packaging. Changed one iButton Ring to yellow.
100139	ImageCast Evolution	Release to production sub-assembly sheet metal parts and Approved Manufacturer List corrections.
100146	ImageCast Evolution	Replaced wiring harness. Added transient voltage protection to docking cable. Updated shaft drawings per vendor's request. Replaced screw type.

ECO#	Component	Description
100151	ImageCast Evolution	Added thumb screws to rear access door. Updated drawings with vendor recommended changes. Combined the thermal printer and harness into one ordering PN.
100160	ImageCast Evolution	Replaced screw that had become obsolete.
100162	ImageCast Evolution	Updated some tolerances on plastic and sheet metal part drawings. Added reference to consumable kit for manufacturing planning.
100170	ImageCast Evolution	Updated CFO card programming procedure. Added Loctite to mounting foot screws.
100171	ImageCast Evolution	Added tie wrap and wire saddle to prevent cables from rubbing on edge of side frame. Added second label for base Bill of Material revision number and IR sensor firmware version number.
100172	ImageCast Evolution	Added pad printing to ballot input slot area to improve usability for voters. Trimmed length of EMI gasket part.



United States Election Assistance Commission



Certificate of Conformance

Dominion Voting Systems Democracy Suite 4.14-D

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 *Voluntary Voting System Guidelines (2005 VVSG)*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the *EAC Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: Democracy Suite

Model or Version: 4.14-D

Name of VSTL: NTS Huntsville

EAC Certification Number: DVS-DemSuite4.14-D

Date Issued: 11/25/2014

Chief Operating Officer & Acting Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Manufacturer: Dominion Voting
System Name: Democracy Suite 4.14-D
Certificate: DVS-DemSuite4.14-D

Laboratory: NTS Huntsville
Standard: VVSG 1.0 (2005)
Date: November 25, 2014



Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

The Dominion Democracy Suite 4.14-D Voting System is a modification to the certified Democracy Suite 4.14-B Voting System. The full Dominion Democracy Suite 4.14-B Voting System description can be found in the EAC Certificate of Conformance dated January 7, 2014.

The Dominion Democracy Suite 4.14-D Voting System includes the modifications listed below:

1. Introduction of a new optional Adjudication application that allows review of voter intent on a ballot by ballot basis from the ImageCast Central device utilized during either absentee voting or post-voting activity phases.

2. In the EMS EDT module, added support for Cross-Over rule for Open Primaries into the spreadsheet.
3. In the EMS EED module:
 - a. Added the ability to override global settings for visual elements on the level of contest.
 - b. Added the ability to print graphics on selected contests in the candidate cell next to the candidate name.
 - c. Added the ability to generate a printer calibration sheet.
 - d. Added the ability to render crop marks on the ballot.
 - e. Added basic control of the layout and content of Write-in cells.
 - f. Extended election files for ICP with list of audio languages per Ballot Manifestation. Support for languages without textual representation, i.e. audio-only languages (Navajo)
 - g. Added new Office Type Party Preference.
 - h. Added ability to render Party Preference Contests on ballot.
 - i. Added ability to pass Party Preference Contest Information to tabulators via election files.
 - j. Added support for Undeclared Open Primaries into election files for tabulators.
 - k. Added ability to apply Cross-Over rule to Elector Groups.
 - l. Added support for creation of audio for Electoral Groups.
4. In the EMS RTR module:
 - a. Added the ability to manage reporting profiles.
 - b. Added ability to import/export reporting profiles.
 - c. Added ability to handle Party Preference Contest results.
 - d. Added support for Undeclared Open Primary voting rules.
5. Across the system, added support for Open Primary elections.
6. Updated Dominion logos used in the applications.
7. In the ICP application:
 - a. Changes in program code for accessing thresholds in the battery voltage table.
 - b. Added support for languages without textual representation (i.e., Navajo).
 - c. Added Open Primary including the Pick-A-Party variant as required for WI
 - d. Added support for Open Primaries including a DCF option to group per election group on the report tape.
 - e. Added DCF option to format Zero Totals tape separate from Results tape format.
8. In the ICE application:
 - a. Modified override default configuration. Override functionality enables improved configurability in the following ways: new translation adding, translation files overriding, and static audio files overriding.
 - b. Added MBS (Machine Behavioral Settings) options to report multiple write-in positions separately on zero reports and results reports, to provide Total Cast and Total Voters on the results transfer report, and to support an optional external COTS display for accessible voting sessions.
 - c. Improved presentations of voting rule error messages.
 - d. Added three additional languages to the install package: Hindi, Khmer, and Thai.

- e. Added the ability to allow unit to scan and cast marked ballots while ballot selections are being made concurrently during an independent accessible voting session, using the ATI and the external COTS display.
- f. Added the ability to enable an external monitor in the diagnostics menu.
- g. Added additional options to the Print Head Servicing feature: frequency of print head cleaning, and number of servicing routines in the cleaning procedure.
- h. In the ICE configuration, added an optional external COTS display to present the ballot image and the voter's selections during an accessible voting session.
- i. Added a new main LCD panel.
- j. The following logos were updated: Boot Startup Logo, Linux Startup Logo, Application Startup Logo, Verification Screen (displays the new logo and a new monochrome hourglass widget.)
- k. For open primaries, added ability to respond to cross-over ballot errors. New MBS options introduced:
 - Show/hide Non-Partisan contests on the reports.
 - Show/hide Elector Groups on the reports.
- l. For open primaries, improvements were made to the Ballot Review function, where if there are no votes on entire Open Primary ballot, for the contest that belongs to an Elector Group, report it as "NO VOTES CAST."
- m. Support for Party Preference rule in Standard and AVS voting sessions.
- n. Added ability to report Party Preference Contest on the tape.
- o. For support of audio notification when voting error occurs in Standard voting session, added MBS option to enable/disable audio, and added MBS option for volume adjustment.
- p. Modified listing of audio languages at the beginning of an AVS session to presented according to 'global order' from EMS. The default audio language is always listed first.

9. In the ICC configuration:

- a. Added the Canon DR-G1130 scanner.
- b. Added the ability to apply Open Primary voting rules (e.g. Stop on Cross Votes).

10. In the EMS Standard Server configuration, added a hardware RAID controller to improve the performance of that computer configuration utilizing the following parameters:

- Raid 1 (system partition) = (2) 1 TB mirrored drives. One disk needed for recovery.
- Raid 10 (data partition) = (4) 1 TB striped drives. Two disks needed for recovery.

The Dominion Voting Systems Democracy Suite 4.14-D System is a paper-based optical scan voting system. The certified system 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.

Election Management System

The Dominion Voting Systems Democracy Suite 4.14-D EMS consists of eleven 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-D EMS Election Event Designer client application - integrates election definition functionality and represents a main pre-voting phase end-user application.
- Democracy Suite 4.14-D 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-D 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-D EMS Data Center Manager client application - represents a system level configuration application used in EMS back-end data center configuration.
- Democracy Suite 4.14-D 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-D 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-D 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-D EMS Election Data Translator (EDT) – Exports and Imports data in a format suitable for rapid interaction with Election Event Designer (EED).
- Democracy Suite 4.14-D EMS Adjudication – Represents the server and client components responsible for adjudication, including report and generation of adjudicated result files from ImageCast Central tabulators.
- Democracy Suite 4.14-D EMS Adjudication Service – Represents a server side application which provides ballot information, such as contests, candidates and their coordinates from EMS to the Adjudication application.
- Democracy Suite 4.14-D EMS File System Service – A stand-alone services that runs on client machines, enabling access to low level operating system API for partitioning CF cards and reading raw partition data on the ICP CF card.

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.

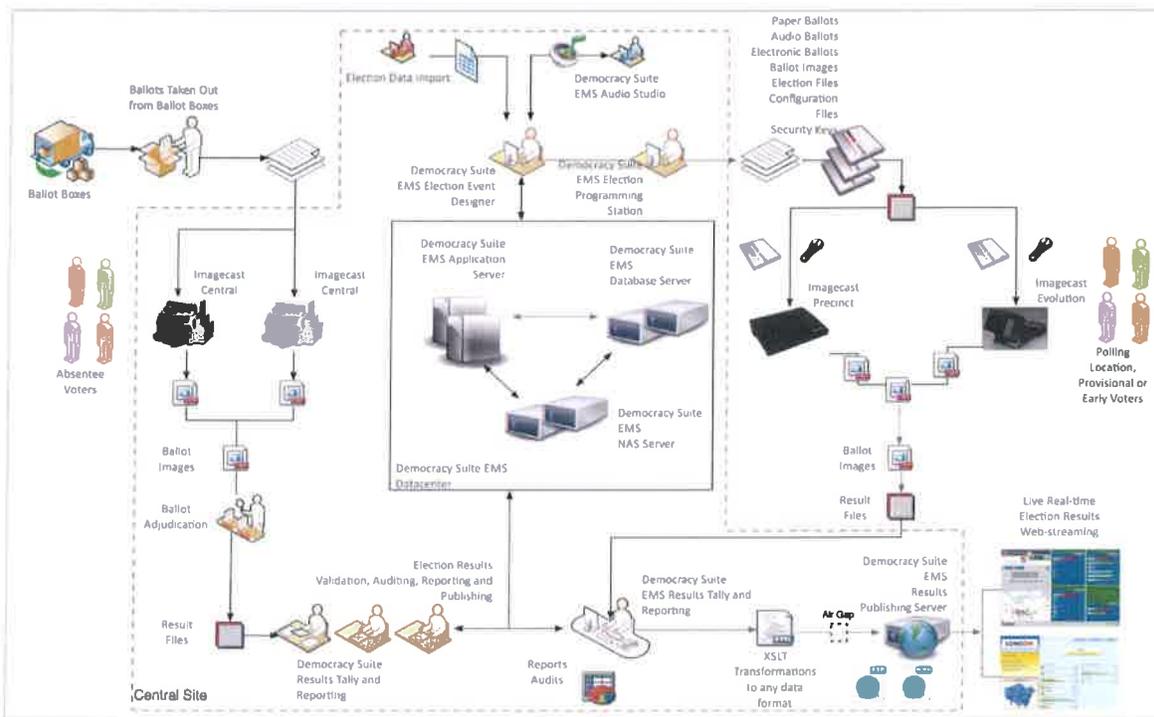
EMS Standard hardware configuration - the EMS server components were installed on a single physical server, in addition to the Local Area Network (LAN) switch devices, while the EMS client components were installed on one or more physical PCs or laptops. In this configuration, all system components were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

- The ImageCast Evolution (ICE) Precinct Ballot tabulator. It 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 and/or audibly via integrated headphones), and upon the voter's acceptance, deposit the ballots into the secure ballot box. The tabulator 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 (ADA sessions). The supported binary input devices include a Sip and Puff device, Foot Pedals, and Audio Tactile Interface (ATI). The addition of the external monitor added in this modification allows for simultaneous ADA and ballot casting sessions. 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. Additionally, ballots marked by the ImageCast Evolution may be subsequently scanned on the ImageCast Precinct or the ImageCast Central if a recount is required.
- ImageCast Precinct (ICP) precinct scanner The ImageCast Precinct 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 the paper ballot. Like the ImageCast Evolution, the ImageCast Precinct also supports enhanced accessibility voting which is enabled by connecting the interchangeable Sip-and-Puff device, Foot Pedals, or Audio Tactile Interface (ATI).
- ImageCast Central (ICC) central count scanner. The ImageCast Central Count system is a high-speed, central ballot scan tabulator based on Commercial off the Shelf (COTS) hardware, coupled with a custom-made ballot processing software application. It is used for high-speed scanning and counting of paper ballots. The ICC system hardware consists of the following two COTS devices working together to provide accurate ballot processing functionality:
 - Canon DR-X10C Scanner: Provides high-speed ballot scanning functionality, transferring the scanned images to the connected ImageCast Central Workstation.
 - Canon DR-G1130 Scanner: Provides high-speed ballot scanning functionality, transferring the scanned images to the connected ImageCast Central Workstation.
 - ImageCast Central Workstation: An all-in-one PC workstation used for ballot image and election rules processing. The workstation can be deployed in a stand-alone or networked configuration, allowing for automatic results transfers to the EMS Datacenter. The ImageCast Central workstation is COTS hardware which executes software for both image-processing and election rules application, such as "Vote for 2."

Tested Marking Devices: Sharpie brand markers, black ink.

Mark definition: 50% or more of the target area marked consistently provides mark recognition. The manufacturer recommends black ink for marking ballot selections.

Democracy Suite System Diagram



Language capability: This voting system supports: Alaska Native, Aleut, Athabascan, Chinese, English, Eskimo, Filipino, French, Hindi, Japanese, Khmer, Korean, Spanish, Thai, and Vietnamese. Additionally, the following Native American languages are supported: Apache, Jicarilla, Keres, Navajo, Seminole, Towa, Ute, and Yuman.

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
ImageCast Precinct	4.14.17-US	320A	uClinux	
ImageCast Precinct	4.14.17-US	320C	uClinux	
ImageCast Evolution	4.14.21	410A	Ubuntu linux	
ImageCast Central	4.14.17	Canon DR-X10C Canon DR-G1130	COTS	Windows 7 Professional x64
Democracy Suite election management system	4.14.37	N/A (application software)	Windows Server 2008 R2	
Adjudication	2.4.1.3201	N/A (application software)	Windows 7 Professional x64 or Windows Server 2008 R2	
Server Hardware		Dell PowerEdge T620	Windows Server 2008 R2	Processor: Intel Xeon E5-2620 2.0 GHz, Memory: 2x 4GB 1333MHz DDR3, Hard Drive Capacity: 2x 500GB
Client Hardware		Dell Precision T1700	Windows 7 Professional	Intel Core i5-4570@3.2GHz, 8GB RAM, 500 GB HD
Client Hardware		DELL Latitude e6540	Windows 7 Professional x64	Intel Core i7-4810MQ@2.8GHz, 8GB RAM, 500GB HD
ICC Workstation Hardware		DELL Optiplex 9020 All in One	Windows 7 Professional x64	Intel Core i7-4770S@3.1GHz, 8GB RAM, 500 GB HD
ICC Workstation Hardware		DELL Optiplex 9030 All in One	Windows 7 Professional x64	Intel Core i5-45900S@3.0GHz 8GB RAM, 500 GB HD
NAS disk array		Rocstor Guardian 4RM	COTS	4TB or 8TB size
ICE external LCD monitor		AOC	E1649FWU	

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Additional data storage		Rocstor Commander 2UE or Hawker HX	COTS	500GB or 1TB
iButton (SHA-1) with USB Reader/Writer		USB R/W: DS9490R# with DS1402-RP8+ iButton: DS1963S	COTS	MAXIM/Dallas Semiconductor
LCD monitor		DELL 1909W or DELL N445N or Soyo 18.5" wide LCD or Samsung 23" wide LCD	COTS	
Audio Adapter		Soundwave 7.1 USB Audio Adapter	COTS	
PCI Software	Soundwave 7.1		COTS	
USB software	Soundwave 7.1 USB		COTS	For audio adapter
Network switch		5-Port Switch: D-Link DES-1105	COTS	Also can use DGS-108 if 8-port needed
Mouse		Dell or Microsoft	COTS	With rollerball
Keyboard		Kensington, Microsoft, or IBM	COTS	USB enabled
Compact Flash Reader/Writer		SanDisk or GGI Gear	COTS	
Accessible Tactile Interface (ATI)		1.10		
Headphones		Cyber Acoustics	COTS	Cyber Acoustics ACM-70
eSATA PCI card		SIIG, Inc	COTS	eSATA II PCIe Pro Card
Sip and Puff		Origin Instruments	COTS	Origin Instruments AirVoter
Disposable Sip and Puff Mouthpieces		Origin Instruments	COTS	Origin Instruments AC-310
Footswitch Pair		Kinesis	COTS	#971
Compact Flash cards		SanDisk Extreme; Sandisk, or RiData	COTS	SanDisk SDCFX-016G, SDCFX-032G RiData CFC-14A, RDCF8G-233XMCB2-1, RDCF16G-233XMCB2-1, RDCF32G-233XMCB2-1
Machine Tape rolls			COTS	Available from Dominion Voting
Tamper Evident Seals			COTS	Available from Dominion Voting
Ballot Privacy Sleeves		Various lengths to fit the ballot		Available from Dominion Voting

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Machine cleaning kit		For ImageCast Precinct, Evolution, and Central		Available from Dominion Voting

System Limitations

This table depicts the limits the system has been tested and certified to meet.

Characteristic	Limiting Component	Limit	Comment
Ballot positions	The ballot	462	Standard Configuration
Precincts in an election	EMS	1000	Standard Configuration
Contests in an election	EMS	4000	Standard Configuration
Candidates/Counters in an election	EMS	40000	Standard Configuration
Candidates/Counters in a precinct	Tabulator	462	Standard Configuration
Candidates/Counters in a tabulator	Tabulator	10000	Standard Configuration
Ballot Styles in an election	Tabulator	4000	Standard Configuration
Contests in a ballot style	Tabulator	156	Standard Configuration
Candidates in a contest	EMS	462	Standard Configuration
Ballot styles in a precinct	Tabulator	5	Standard Configuration
Number of political parties	Tabulator	30	Standard Configuration
"vote for" in a contest	Tabulator	30	Standard Configuration
Supported languages in an election	Tabulator	5	Standard Configuration
Number of write-ins	The ballot	462	Standard Configuration
Ballot positions	The ballot	462	Express Configuration
Precincts in an election	EMS	250	Express Configuration
Contests in an election	EMS	250	Express Configuration
Candidates/Counters in an election	EMS	2500	Express Configuration
Candidates/Counters in a precinct	Tabulator	462	Express Configuration
Candidates/Counters in a tabulator	EMS	2500	Express Configuration
Ballot Styles in an election	EMS	750	Express Configuration
Contests in a ballot style	Tabulator	156	Express Configuration
Candidates in a contest	EMS	231	Express Configuration
Ballot styles in a precinct	Tabulator	5	Express Configuration
Number of political parties	Tabulator	30	Express Configuration
"vote for" in a contest	Tabulator	30	Express Configuration
Supported languages in an election	Tabulator	5	Express Configuration
Number of write-ins	The ballot	462	Express Configuration

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	N/A	
Accessibility		

Feature/Characteristic	Yes/No	Comment
Forward Approach	YES	
Parallel (Side) Approach	YES	
Closed Primary		
Primary: Closed	YES	
Open Primary		
Primary: Open Standard (provide definition of how supported)	YES	
Primary: Open Blanket (provide definition of how supported)	YES	
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	YES	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	YES	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	YES	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	YES	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	YES	
Write-in Voting: Without selecting a write in position.	NO	
Write-in: With No Declared Candidates	YES	
Write-in: Identification of write-ins for resolution at central count	YES	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	YES	
Slate & Group Voting: one selection votes the slate.	YES	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	YES	Equal time rotation
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	YES	
Straight Party: Vote for each candidate individually	YES	
Straight Party: Modify straight party selections with crossover votes	YES	
Straight Party: A race without a candidate for one party	YES	
Straight Party: "N of M race (where "N">1)	YES	
Straight Party: Excludes a partisan contest from the straight party selection	YES	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	YES	
Split Precincts:		
Split Precincts: Multiple ballot styles	YES	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	YES	
Split Precincts: DRE matches voter to all applicable races.	N/A	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	YES	
Vote N of M:		
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	YES	
Vote for N of M: Invalidates all candidates in an overvote (paper)	YES	

Feature/Characteristic	Yes/No	Comment
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	YES	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2 nd contest.)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2 nd contest.)	NO	
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	NO	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	NO	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	NO	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	NO	
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	NO	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	NO	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	NO	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	YES	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	NO	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	YES	

Feature/Characteristic	Yes/No	Comment
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	YES	Overvotes cause a warning to the voter and can be configured to allow voter to override.
Overvotes: DRE: Prevented from or requires correction of overvoting.	N/A	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	YES	If allowed via voter override, overvotes are tallied separately.
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	YES	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	YES	Precinct voters receive a warning; both precinct and central scanners will warn on blank ballots.
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	YES	Blank ballots are flagged. These ballots can be manually examined and then be scanned and accepted as blank; or precinct voter can override and accept.
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	YES	Operators can examine a blank ballot, re-mark if needed and allowed, and then re-scan it.
Networking		
Wide Area Network – Use of Modems	NO	
Wide Area Network – Use of Wireless	NO	
Local Area Network – Use of TCP/IP	YES	Client/server only
Local Area Network – Use of Infrared	NO	
Local Area Network – Use of Wireless	NO	
FIPS 140-2 validated cryptographic module	YES	
Used as (if applicable):		
Precinct counting device	YES	ImageCast Precinct and Evolution
Central counting device	YES	ImageCast Central

Section 2.13
SYSTEM CHANGE NOTES
Election Management System

Version 1.9

05/04/2015

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SYSTEM CHANGE NOTES
For
Election Management System (EMS)

The Election Management System V4.0 was originally granted VVSG 2005 certification by the EAC as an entirely new voting system design, written in the Visual Basic (VB).Net language. It consists of five modes, and each mode has unique functionalities and capabilities integrating all aspects of the election process. As such, EMS software V4.0 and all associated TDP documentation were considered an entirely new submission. The ITA had not tested the new VB.Net design previously, nor had the software ever been issued a qualification number. Following the original certification, V4.0B was issued and certified, and finally the current version, 4.1, has been submitted for certification. These are the applicable system change notes since the baseline V4.0 system was originally certified:

Version 4.0B

Enhancements

E-01 – (EMS) - A five minute timeout was removed and two stored procedures were improved to provide better performance when posting vote data.

E-02 – (EMS) - Offices were wrapped if there was no room for the entire office in a column or on a page. A modification was made to move the entire office to the top of the next column if the entire contest would not fit in the previous column.

E-03 – (EMS) - A warning was added for the "Resorting of Candidate" function to prevent unintended results.

E-04 – (EMS) - Candidate name wrapping caused ballots to be longer than necessary. A calculation was updated to calculate the page width accounting for the fact that a two-column layout only needs space for a single gutter where the calculation previously allocated space for a gutter per column. In the EMS, the default border for the candidate box was removed and font size was modified to decrease the ballot size and provide a more accurate representation of the Infinity Panel display.

E-05 – (EMS) - "All" option on the Precinct summary report was modified to be more useable. Page breaks and numbering were added to enhance the readability of the report.

E-06 – (EMS) - A modification was made to add running mate to the "Report", "Tally", and "Phonetics" fields.

E-07 – (EMS) - Report and Tally Names did not allow the "/" or "&" characters. A modification was made to allow these characters.

E-08 – (EMS) - The arrow navigation keys required a double press to get to the next field. A modification was made to allow a single selection to navigate to the next field.

E-09 – (EMS) - Activation names did not allow the dash character. A modification was made to allow the dash character in the activation name.

E-10 – (EMS) - Text could not be added between the "Office Title" and "Candidate Names" in the ballot layout. A modification was made to allow additional text to be added between these fields.

E-11 – (EMS) - To allow the ballot designer to observe custom text formatting by the user, the auto left and right alignment was removed for this text except for the first line of text on absentee ballots.

Defects

D-01 – (EMS) - An office placed on a ballot without enough space for the entire contest was being split into two parts with a gap. This issue has been corrected.

D-02 – (EMS) - The "Sort By Name Within Party" function did not function properly. Non-Partisan candidate fields like "Write-in" and "No Candidate Filed" would appear at the top of the sorted list even after candidates were added. A modification was made to place non-party candidates (including "Writein" and "No Candidate Filed") at the end of the candidate list.

D-03 – (EMS) - The sorting preference of "None" placed the "No Candidate" after regular candidate names and before "Write-In" candidate name. A modification was made to preserve the order of entry for candidates.

D-04 – (EMS) - Ballot text ran across the center line on the Infinity panel. A modification was made to correct this issue.

Feature

F- 01 – (EMS) - "Merge" database option was added to the existing options to backup, restore, delete, and copy a current database. This feature shall merge a "backed up" election database into the current database.

Version 4.1

The procedures for testing the revised 4.1 system as a whole are contained in Appendix A, Test Case A-EMS41-C01 and results are captured in the executed test case.

Enhancements

1. E-01-(EMS) - The revised system will support variable size Tally smart cards. Previously only one fixed Tally storage size was supported (16K). This will allow us to accommodate customers requiring greater storage capacity for tallying the Infinity panel to a smart card. Both the Infinity and EMS software will now detect and read/write to all available storage. This revision will continue to certify the original 16K Tally card and a new 115K Tally card for use.

This change affects coding for both the Infinity firmware and EMS Tally card reading. In addition, a new Carson Mfg. Document was added (Infinity Smart Card Spec) to the TDP to clarify the formatting of conforming Tally cards. Various size tally results were tested using the new code and the results were positive and accurate. The poll worker manual references to Tally cards have been modified to reflect the enhancement.

The procedures for testing enhancement 01 are contained in Appendix A, Test Case A-EMS41-E01 and results are captured in the executed test case.

2. E-02-(EMS) – Increase undervote manual entry capacity. For elections which contain large numbers of undervoted contests (i.e. a large primary election with a combined absentee precinct) this enhancement will allow a single manual vote entry to input the vote totals eliminating the need to split the entry into smaller pieces.

The procedures for testing enhancement 02 are contained in Appendix A, Test Case A-EMS41-E02 and results are captured in the executed test case.

3. E-03-(EMS) – Add tblProcessingError event log to detail audit report for enhanced audit reporting of unexpected processing errors that occur during EMS application execution.

The procedures for testing enhancement 03 are contained in Appendix A, Test Case A-EMS41-E03 and results are captured in the executed test case.

Defects

The first three defects were “grandfathered” into V4.0B by the EAC on the condition that they were corrected with the next certification, and the fourth was identified by the manufacturer subsequent to V4.0B certification.

1. D-01-(EMS) – Audit reporting is now available within the EMS application as a standard report. Previously this was provided via multiple disk files.

The change affects several lines of EMS code during Audit report generation. The report itself already existed with the initial V4.0 baseline certification and was bypassed in version 4.0B to reduce the time to generate the report to disk. Several dozen audit reports were generated in both installation and election modes and in all test cases the reports displayed properly. The new version of the ComponentOne reporting control has dramatically improved report performance making the onscreen report feasible and compliant.

The procedures for testing defect 01 are contained in Appendix A, Test Case A-EMS41-D01 and results are captured in the executed test case.

2. D-02-(EMS) – Database version control has been added to prevent the opening of backup elections containing executable code from other versions of the EMS software.

The V4.0 baseline EMS database already contained a version column in the tblElection table which was not being used. Two minor code changes were made to the EMS software to accommodate election version control. The first change involved including the software version during creation of a new election from the election maintenance screen. The second involved comparing the stored value to the currently executing software version during the election opening procedure from the same screen. If the two don't match a popup window displays the error and prevents opening the election. Because SQL 2000 MSDE backups cannot be directly restored to a SQL 2012 installation, any attempt to restore an election created using a previous version of EMS will also fail with an error as well. Various test cases were executed and in all cases only current elections with the same version number could be opened.

The procedures for testing defect 02 are contained in Appendix A, Test Case A-EMS41-D02 and results are captured in the executed test case.

3. D-03-(EMS) – Method of inserting ballot objects, informational messages and error trapping and logging for the ballot designer have all been improved to address a previously identified ballot designer deficiency which could not be duplicated by the test lab or MicroVote as well as to improve the user experience.

Try..Catch error trapping and logging was added around additional routines in the ballot designer and ballot class code. Also, when an object is inserted into the ballot a check is made to see if the location is valid with enough empty spaces to hold the object. In the past objects would be moved forward in the ballot design to allow the object to be inserted, often causing additional work for the end user if the new locations weren't desired. Now the user is instead given an informational popup telling them how much additional space is required and the design remains unchanged. Also, a new informational message informs the user that they can't drop an object on an occupied space.

The procedures for testing defect 03 are contained in Appendix A, Test Case A-EMS41-D03 and results are captured in the executed test case.

4. D-04-(EMS) – Overall election voter turnout percentage variance on the Election Summary and All Precincts header.

The overall election voter turnout percentage should be calculated by dividing the total public count by the total registered voters for all precincts (multiplied by 100 with a '%' sign) and is reported on the Election Summary report and the first page of the All Precincts report. Instead the two reports are displaying the voter turnout percentage for the lowest precinct in the sort order (usually Precinct 1), which may or may not match the actual overall percentage. Voter turnout percentages on the individual precinct reports are being correctly reported. A modification was made in COTS generated XML code to correct the deficiency.

The procedures for testing defect 04 are contained in Appendix A, Test Case A-EMS41-D04 and results are captured in the executed test case.

5. D-05-(EMS) – Candidate reorder warning message.

When reordering candidates within an office within the EMS software a warning message should popup alerting the user if the candidate is contained on any ballot styles. The message was not consistently displaying. A single change was made to the EMS code to correct the defect.

The procedures for testing defect 05 are contained in Appendix A, Test Case A-EMS41-D05 and results are captured in the executed test case.

6. D-06-(EMS) – Windows 7 SCAP security hardening.

Changes were made to the 4.1 installation based on the SCAP security spreadsheet applicable to Windows 7. This defect is to address several changes that were not correctly integrated into the installation package and identified by NTS during code review.

The procedures for testing defect 06 are contained in Appendix A, Test Case A-EMS41-D06 and results are captured in the executed test case.

7. D-07-(Infinity Firmware) – Shading removed from contest headers.

Infinity panel firmware was modified to remove shading from contest headers in order to maintain a 3:1 contrast ratio between text and background.

The procedures for testing defect 07 are contained in Appendix A, Test Case A-EMS41-D07 and results are captured in the executed test case.

8. D-08-(Infinity Firmware) – Lighten/Darken button functionality reversed

Infinity panel firmware was modified to reverse the functionality of the lighten/darken buttons on the voter controls page.

The procedures for testing defect 08 are contained in Appendix A, Test Case A-EMS41-D08 and results are captured in the executed test case.

Replacement of End-Of-Life components

1. R-01-(EMS) – New Infinity processor board/bridge/heat sink assembly (PCM-3336-BRIDGE-A03) to replace current EOL processor board, new universal baseboard, new smart card reader and new LED display to replace EOL CCFL display. New Infinity firmware is compatible with both the current and new processor boards, baseboards, displays and card readers.

The new assembly was developed over two years to be compatible with the latest motherboard technology and provide a bridge to the new Infinity baseboard. Carson Mfg. implemented several minor code changes to the Infinity firmware in order to

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The new assembly was developed over two years to be compatible with the latest motherboard technology and provide a bridge to the new Infinity baseboard. Carson Mfg. implemented several minor code changes to the Infinity firmware in order to

accommodate changes for the new assembly while maintaining compatibility with present motherboards certified and in use. Test cases were executed over many months to demonstrate compatibility and operating stability under various conditions, including prolonged continuous burn-in use over four days and a great variety of election combinations. The new assembly requires a minor document change to the Infinity manual in order to modify the battery backup requirement (from eight C-Cell batteries to one external 1300VA battery backup). Carson issued ECN #1505 and #1510 to document the needed hardware configuration changes.

The procedures for testing replacement 01 are contained in Appendix A, Test Case A-EMS41-R01 and results are captured in the executed test case.

2. R-02-(EMS) – New USB PC/SC compatible smart card reader support to replace EOL serial port smart card reader attached to EMS computer.

A new class (clsPCSC.vb) was added to EMS containing approximately 700 lines of code. This class contains the routines necessary to communicate with a standard USB PC/SC compatible smart card reader using standard Windows 7 libraries. Modifications were also made in two EMS forms that interact with smart cards – the smart card tallying form (frmPCSC.vb) and the form that resets Vote and VoteN smart cards (frmCard.vb). Testing revealed the new code works extremely well with both original and newly expanded Tally cards (as well as the other cards), especially when tallying a large amount of data contained in new expanded Tally cards. Tallying times for a fully loaded 115K Tally card are estimated to reduce time to read from eight minutes to three seconds. Multiple internal test elections were successfully tallied over a period of months. A few minor document changes were made to the TDP reflecting the new physical configuration (eliminating the specific GEMPLUS reader references).

The procedures for testing replacement 02 are contained in Appendix A, Test Case A-EMS41-R02 and results are captured in the executed test case.

3. R-03-(EMS) – Upgraded EMS development environment to Visual Studio 2013 to replace EOL Visual Studio 2003.

Virtually every EMS source code file was affected to one degree or another by this change and documented throughout the code. References to Visual Studio 2003 were revised in the TDP.

The procedures for testing replacement 03 are contained in Appendix A, Test Case A-EMS41-R03 and results are captured in the executed test case.

4. R-04-(EMS) – Upgraded Microsoft .Net Framework to version 3.5 SP1 to replace EOL version 1.1.

The most noticeable effect of upgrading to 3.5 SP1 is the elimination of the third party SerialTools library by Franson as serial ports are now supported by the .Net Framework. Modifications were made to any code addressing the serial port and

documented within the EMS source code. In all test cases the new .Net serial functionality performed identically to the EOL Franson tools.

The procedures for testing replacement 04 are contained in Appendix A, Test Case A-EMS41-R04 and results are captured in the executed test case.

5. R-05-(EMS) – Upgraded OS to Microsoft 7 Professional from EOL Windows XP SP2 and installed latest security patches.

This OS has been thoroughly documented by Microsoft to replace Windows XP which is reaching end-of-life in April, 2014. All references within the TDP to XP have been revised. All of the internal testing was conducted using Windows 7 which is a very stable OS and all of the current assemblies and tools are compatible with Windows 7.

The procedures for testing replacement 05 are contained in Appendix A, Test Case A-EMS41-R05 and results are captured in the executed test case.

6. R-06-(EMS) – Upgraded ComponentOne library to current Ultimate version from EOL Enterprise version.

Virtually all of the EMS source code was affected in varying degrees by the upgrade of the ComponentOne library. Most of the onscreen controls are derived from C1 controls, including text boxes, drop boxes, lists, grids, and reports. The only needed changes to the TDP involved software configuration references. General testing was conducted throughout development.

The procedures for testing replacement 06 are contained in Appendix A, Test Case A-EMS41-R06 and results are captured in the executed test case.

7. R-07-(EMS) – Eliminated requirement for EOL Franson SerialTools assembly as this functionality is built into Visual Studio 2013.

Upgrading the .Net Framework to 3.5 SP1 and Visual Studio 2013 eliminated the necessity of using this EOL third party software to send and receive data through the serial port. Only serial communication code was affected by the change which included serial Infinity programming, vote extraction, and OMR ballot reading. All serial port communications was normal throughout development using the updated methods provided by Microsoft. Changes to the TDP were made to eliminate references to the Franson assembly.

The procedures for testing replacement 07 are contained in Appendix A, Test Case A-EMS41-R07 and results are captured in the executed test case.

8. R-08-(EMS) – Upgraded database server to Microsoft SQL Server 2012 Express (SP1) from EOL Microsoft SQL Server 2000 Desktop Edition (MSDE).

Microsoft has made multiple improvements to SQL server over the past 14 years which are now implemented in the EMS backend database. The change is mostly transparent to the EMS source code and makes installation using the Advanced Installer software much more streamlined. Any minor code changes as a result of the upgrade were documented within the code. Changes to the TDP included modifying any references to the older version of SQL.

The procedures for testing replacement 08 are contained in Appendix A, Test Case A-EMS41-R08 and results are captured in the executed test case.

9. R-09-(EMS) – Upgraded project installation to Advanced Installer Enterprise Edition V11.1 from EOL Microsoft InstallShield.

Microsoft bundled a “light” edition of InstallShield with Visual Studio 2013 which did not provide enough functionality for a streamlined, smooth installation of EMS without much user intervention. The Enterprise edition of Advanced Installer allowed for a much simpler build and installation procedure, as outlined in Appendix Y. The previous version of EMS included three solutions which needed to be individually reviewed, built and installed. With the current version these three solutions have been combined into just one, with the Installation routines added as a project within the solution. The only other change to the TDP involved revising references to InstallShield.

The procedures for testing replacement 09 are contained in Appendix A, Test Case A-EMS41-R09 and results are captured in the executed test case.

10. A-10-(EMS) – Added new Dell Latitude 14 5000 Series laptop in addition to currently certified laptop and desktop computers.

The procedures for testing addition 10 are contained in Appendix A, Test Case A-EMS41-A10. Results of testing are pending arrival of the new laptop and will be reported in a future version of this document.



United States Election Assistance Commission



Certificate of Conformance

**MicroVote EMS 4.1
(Modification)**

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the *2005 Voluntary Voting System Guidelines Version 1.0*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the *EAC Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: MicroVote EMS 4.1 (Modification)

Model or Version: Version 4.1

Name of VSTL: NTS Huntsville

EAC Certification Number: MVTEMS41

Date Issued: July 16, 2015

A handwritten signature in blue ink, appearing to read "D. S. Miller".

Chief Operating Officer & Acting Executive Director

Scope of Certification Attached



Scope of Certification

Manufacturer: **MicroVote General Corporation** Product: **EMS4.1 (Modification)**

VSL: **NTSLaboratories** Certification #: **MVTEMS41** Standard: **VWSG2005** Date: **07/16/2015**

This document describes the scope of the certification of the modified system identified above, which is the system certified under certificates MVTEMS4 and MVTEMS40B (Modified) with changes modifying the system to MicroVote EMS4.1 (Modified). Configuration changes, revision changes, additions or subtractions from the system defined in this document are not included in this certification.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is not:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

Language capability:

In addition to English, the voting system has the capability of presenting the ballot, ballot selections, review screens and instructions in Spanish.

Definition of Modification:

A modification is any change to a previously EAC-certified voting system's software, or firmware or hardware that is not determined to be a de minimis change. All modifications to a voting system require testing and review by the EAC in accordance to the requirements of Chapter 4 of the Voting System Testing & Certification Program Manual.

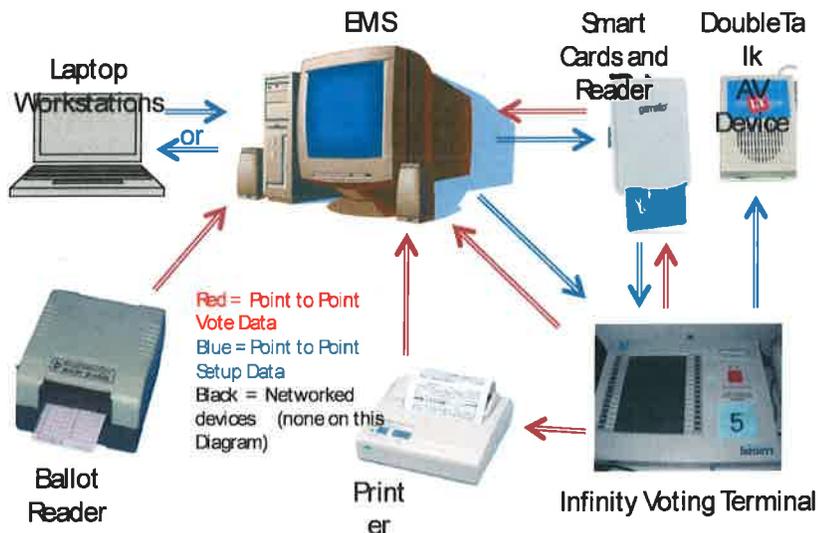
Certified System before Modification:

MicroVote General Corporation Election Management System Release 4.0
Certificate ID: MVTEMS40

MicroVote General Corporation Election Management System Release 4.0B (revision)
Certificate ID: MVTEMS40B

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.



System Component	Software or Firmware Revision	Hardware Revision	COTS Information	Dependency Notes
EMS Software MicroVote 4.1	Software 4.1.21.0	N/A	--	MicroVote EMS 4.1
EMS Server Dell Desktop	COTSSQL SERVER2012 SP1	COTS Model DHM or Dell Optiplex 3010	Windows 7 Professional SP1	MicroVote EMS 4.1
Laptop(s) Dell	COTSSQL SERVER2012 SP1	COTS Model Dell Latitude PP17L or E5440	Windows 7 Professional SP1	MicroVote EMS 4.1
Infinity Model VP 1 Voting Panel	Firmware V4.10-983	Rev Cor Rev D.05	--	Rev C-- All Rev D.05 EMS4.1
Scanner Dual Sided Chatsworth ACP 2200	N/A	COTS Model 605000- 190	--	All Certified Systems
Printer Seiko	N/A	COTS Model DPU- 414 or DPU- 3445	--	All Certified Systems
Doubletalk Model LT3	BIOS0212	V1.0 LT RC8650	--	All Certified Systems
Smartcard Reader	COTS	COTS	PC/SC compatible USB contact reader/writer	MicroVote EMS 4.1
Smart Cards	N/A	16K or 115K	--	16K-- All 115K-EMS4.1
Voting Booth	N/A	Model 2000	--	All Certified Systems

System Limitations

This table depicts the limits of the system has currently been exercised and the vendor calculated design limits.

Characteristic	Limiting Component	Evaluated	BMS	Infinity	ACP 2200
Maximum Ballot Positions	Ballot Design Form	150	600	600	402
Maximum Precincts in Election	Precinct Number	559	9,999	9,999	9,999
Maximum Contests in Election	Contests in Ballot Style * Ballot Styles/Election	100	300,000	2,999,700	2,009,799
Maximum Candidates/Counters in Election	Precinct Counters * Total Precincts	300	5,989,401	5,989,401	4,019,598
Maximum Candidates/Counters in Precinct	Ballot Design Form	125	599	599	402
Maximum Candidates/Counters in Activation	Ballot Design Form	125	599	599	402
Maximum Ballot Styles in Election	Ballot Style Number	270	1000	9999	1000
Maximum Contests in a Ballot Style	Ballot Design Form	50	300	300	201
Maximum Candidates in a Contest	Ballot Design Form	68	599	599	401
Maximum Count for any Precinct Element	Transact-SQL Bigint	600	Note 1	65,000	Note 1
Maximum Ballot Styles in a Precinct	Precinct Style Assignment Form	1	1	1	1
Maximum Activations per Ballot Style	Build Activations Form	15	99	30	99
Maximum Activations per Election	Act/Ballot Style * Ballot Style/Elec	1300	99,000	299,970	299,970
Maximum Number of Parties	Party Code Combinations	8	50,653	598	400
Maximum Vote For in Contest	Office Vote Limit	56	99	64	99

Note 1: 9,223,372,036,854,770,000

Functionality

This section outlines the features that the system does not provide:

VVPAT	No
Wide Area Network Functionality (No use of modems even if included in COTS devices)	No
Used as a precinct counting device?	No
Local Area Network Functionality (No use if TCP/IP, No use of IPad, No use of Wireless even though those interfaces are present on defined equipment)	No

Primary: Open Defined in WSG 2.1.7.2	No
Names of candidates rotation: Defined in WSG 2.1.7.2	No
Recall: Defined in WSG 2.1.7.2	No
Ranked Voting: Defined in WSG 2.1.7.2 (Voters rank candidates in a contest in order of choice (1,2,3,etc.) A write in vote can be ranked)	No
Ranked Vote Tabulation: Defined in WSG 2.1.7.2	No
Voting method exclusive to multi-member boards (Each voter may cast as many votes as there are seats to be filled and may cast two or more of those votes for a single candidate)	No
Encryption of data (Per Federal Standards-FIPS140-2)	No

Engineering Change Orders (ECOs) Included in the Certified Product:
 The system must be configured with all the changes listed in the original certification MVTEMS40, revised certification MVTEMS40B plus for optional Rev D05 Infinity hardware the new changes listed in this table. This table does not include any de minimis changes that may be applied to the system

DATE	ECO Identification	Manufacturer	Description
2/5/2014	# 1505	Carson Manufacturing Co. Inc.	Adjusted scan delay time and clock checks for higher speed main processor
2/27/2014	# 1510	Carson Manufacturing Co. Inc.	Add AAEDN POM-3336-Bridge-A03 as an approved alternate
4/28/2014	# 1518	Carson Manufacturing Co. Inc.	Update Infinity BOM for new production
11/19/2014	#1542	Carson Manufacturing Co. Inc.	New motherboard (baseboard)
5/22/2015	# 1548	Carson Manufacturing Co. Inc.	Modification to mSATA cable to prevent EMI susceptibility
5/26/2015	# 1549	Carson Manufacturing Co. Inc.	Added support for latest Gemalto smart card reader
6/12/2015	# 1553	Carson Manufacturing Co.	New RAM and mSATA

		Inc	chips
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List of Changes to Certified System:

This section outlines the features that have been changed from the originally certified system:

Enhancement	System	Description
E-01	EMSand Infinity Panel	Added support for 115kBTally smart cards. The increased space allows larger jurisdictions to use the tally card feature instead of the direct connect option.
E-02	EMS	Increase undervote manual entry capacity. For elections which contain large numbers of undervoted contests (i.e. a large primary election with a combined absentee precinct) this enhancement will allow a single manual vote entry to input the vote totals eliminating the need to split the entry into smaller pieces.
E-03	EMS	Add tblProcessingError event log to detail audit report for enhanced audit reporting of unexpected processing errors that occur during EMSapplication execution.
Defect	System	Description
D-01	EMS	Audit reporting is now available within the EMSapplication as a standard report. Previously this was provided via multiple disk files.
D-02	EMS	Database version control has been added to prevent the opening of backup elections containing executable code from other versions of the EMSsoftware.
D-03	EMS	Method of inserting ballot objects, informational messages, error trapping and logging for the ballot designer have all been improved to address a previously identified ballot designer deficiency.
D-04	EMS	The overall election voter turnout percentage on the Election Summary and All Precincts header was corrected.
D-05	EMS	Candidate reorder warning message is now consistently displayed.
D-06	EMS	Several changes were made to integrate Windows 7 SCAP security hardening.
D-07	Infinity	Shading was removed from contest headers to maintain 3:1 contrast ratio.
D-08	Infinity	Lighten/Darken button functionality reversed.
Replacement	System	Description
R-01	Infinity	Added Infinity hardware version D05 with new processor board/bridge/heat sink assembly, universal baseboard, LED display, external uninterruptable power supply and optional new smart card reader.