Minutes
State Election Commission Meeting
January 11, 2021

The State Election Commission meeting was called to order by Chairman Donna Barrett at 12:06 p.m., Central Standard Time, January 11, 2021.

The following members and staff were present: Chairman Barrett, Coordinator of Elections Mark Goins and Kathy Summers, Elections Specialist.

The following commissioners were connected by phone: Commissioners Blackburn, Duckett, McDonald, Wallace, Wheeler and Younce.

Others connected by phone were as follows: Jonathan Rummel, Chief of Staff for Secretary of State, Pam Geppert of Hart InterCivic, Stan Nunley, Hawkins County Election Commissioner, Alan Farley Administrator of Elections for Rutherford County and members of the public.

Coordinator Goins read a statement regarding the lack of a physical quorum of the commission and pursuant to Governor Lee's executive order – 71, the State Election Commission was held virtually for those who needed to participate by phone.

Commissioner Wallace made a motion to adopt the below listed minutes and the motion was seconded by Commissioner McDonald.

- October 12, 2020 – Regular Meeting
- November 6, 2020 – Telephonic Meeting
- December 22, 2020 – Telephonic Meeting

(Roll call vote: Aye votes: Barrett, Blackburn, Duckett, McDonald, Wallace and Younce; No votes: None; Abstention: None.)

Commissioner McDonald made a motion pursuant to TCA. § § 2-12-101 and 2-12-106 and seconded by Commissioner Wallace to approve any 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, 2021.

(Roll call vote: Aye votes: Barrett, Blackburn, Duckett. McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.) **(See attached county election commission appointments made.)**

Old Business

- **MicroVote – Bill Whitehead, Regional Sales Manager**

Bill Whitehead requested for approval of EMS 4.41 Infinity Voting System Version with VVPAT and Firmware/Software 4.3A upgrade, as viewed on November 3, 2020, in Bartholomew County, Indiana.

Chairman Barrett and Secretary of State Chief of Staff, Jonathan Rummel gave a review of their site visit in Bartholomew County, Indiana on November 3, 2020.

Chairman Barrett recommended the following requirements for certification:

- Two keys for internal access
- If/When tape changed, tamper tape should be applied
- Limit the access to adjust assigned programmed machines during election
- Ensure all machines assigned are calibrated and then tallied out

Commissioner Blackburn made a motion to approve the use of MicroVote's EMS 4.41 with VVPAT and Firmware/Software 4.3A upgrade. The motion was seconded by Commissioner Younce.

(Roll call vote: Aye votes: Barrett, Blackburn, Duckett. McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

- **Sexual Harassment Training for Administrators and County Election Commissioners**

Chairman Barrett discussed sexual harassment training for Administrators and County Election Commissioners and went over the survey she sent county election commissions regarding Sexual/Workplace Harassment Training and availability within their county.

Commissioner Blackburn made a motion to require county election commission members to have annual Sexual/Workplace Harassment training at a county election commission meeting, seconded by Commissioner Wallace and the motion was unanimously approved.

(Roll call vote: Aye votes: Barrett, Blackburn, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None.)

New Business

- **Hart InterCivic – Pam Geppert, Senior Director of Product Management**

Pam Geppert requested the De Minimis change to Verity Voting as presented on October 12, 2020, be approved.

Commissioner McDonald made a motion to approve the de minimis change submitted by Hart InterCivic, seconded by Commissioner Blackburn and the motion was unanimously approved.

(Roll call vote: Aye votes: Barrett, Blackburn, McDonald, Wallace, Wheeler and Younce; No votes: None; Abstention: None. Commissioner Duckett was not connected to vote.)

Coordinator Update

June Seminar - Coordinator Goins advised commissioners he is still working with TACEO to determine if the annual train will be held in person or virtually.

The meeting was adjourned at 1:34 p.m. Central Time.

The next scheduled meeting is set for April 5, 2021 and will be held in the William R. Snodgrass – Tennessee Tower, Nashville Room - 3rd floor at 12:00 Noon, Central Standard Time.

Respectfully submitted,

Mike McDonald - Secretary
State Election Commission

Tennessee Secretary of State
Tre Hargett

Elections Division
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

Mark Goins
Coordinator of Elections

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

January 11, 2021

Mr. Robert Greene, Director
Office of the Secretary of State – Publications Division
312 Rosa L. Parks Avenue
Nashville, TN 37274

Dear Mr. Greene,

The State Election Commission met by teleconference at 12:06 a.m., CST on Monday, January 11, 2021, in the Nashville Room of the William R. Snodgrass - Tennessee Tower. The notice requirements of TCA § 8-44-108 (b) were fully complied with. A quorum of the Board was not physically present at the location from which the teleconference originated, although a quorum did participate electronically.

In accordance with TCA § 8-44-108 this constitutes the Board's notice of the occurrence of this meeting and the Statement of Necessity.

A telephonic meeting of the Board was required to make county election commission appointments and to conduct commission business.

A Statement of Necessity to that effect was formally adopted by the Board at the beginning of the teleconference, and the Statement of Necessity was included in the Board's minutes.

Sincerely,

Mark Goins
Coordinator of Elections

Enclosure(s): Meeting Notice and Call Instructions

Minutes for Approval

January 11, 2021

- October 12, 2020 – Regular Meeting
- November 6, 2020 – Telephonic Meeting
- December 22, 2020 – Telephonic Meeting

Vacancy Report

January 11, 2021

- Carter Co – Wheeler Appointment
- Morgan Co – Wheeler Appointment
- Rhea Co – Wheeler Appointment

State of Tennessee

State Election Commission
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

Vacant Status

January 11, 2021

Carter	R Judy Blackburn / D Tom Wheeler	
	D	
Morgan	R Kent Younce / D Tom Wheeler	
	D	
Rhea	R Kent Younce / D Tom Wheeler	
	D	

Total Vacancies: 3

State of Tennessee

State Election Commission
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

New Appointment Status

January 11, 2021

		Appointment
Rhea	R Kent Younce / D Tom Wheeler	
	D Sheri Lyn Jones	1/11/2021

Total New Commissioners: 1

MicroVote

Request for Approval

January 11, 2021

- **Bill Whitehead, Regional Sales Manager**
- **Debra Maggart - MicroVote Representative**
  - **EMS 4.4 (Rev E Infinity Voting System Version 4.4 with VVPAT)**
  - **Firmware/Software 4.3A Upgrade**
  - **Demonstration was given before SEC on October 12, 2020.**
  - **Voting Machine Viewed on November 2, 2020, in Columbus, Indiana.**

Tennessee Secretary of State
Tre Hargett

COPY

Elections Division
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

Mark Goins
Coordinator of Elections

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

April 5, 2021

Bill Whitehead, Regional Sales Manager
MicroVote General Corp
6366 Guilford Avenue
Indianapolis, IN 46220-1750

Dear Mr. Whitehead,

This letter is to inform you of certification of the EMS 4.41, Infinity Voting System Version with VVPAT and firmware/software 4.3A upgrade, bearing the EAC Certification Numbers of: MVTEMS441 and MVTEMS43A, by the State Election Commission (SEC) on January 11, 2021. Your voting machine and firmware/software was made available before the SEC for demonstration on October 12, 2020, and viewed in an election on November 3, 2020, in Bartholomew County, Indiana.

Thank you for your cooperation in the certification process.

Sincerely,

Mark Goins
Coordinator of Elections

Enclosures: (2)
Encl 1: - EAC Certification Number MVTEMS441 and MVTEMS43A
Encl 2: - State Election Commission Minutes – January 11, 2021

United States Election Assistance Commission

Certificate of Conformance

MicroVote EMS 4.41

VVSG 2005 VER. I

EAC CERTIFIED

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the *Voluntary Voting System Guidelines Version 1.0 (VVSG 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: EMS

Model or Version: 4.41

Name of VSTL: Pro V&V

EAC Certification Number: MVTEMS441

Date Issued: 09/18/2020

Mona Harrington

Executive Director

Scope of Certification Attached

Manufacturer: *MicroVote General Corporation*
System Name: *EMS 4.41*
Certificate: *MVTEMS441*

Laboratory: *Pro V&V*
Standard: *2005 VVSG*
Date: *09/11/2020*

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:

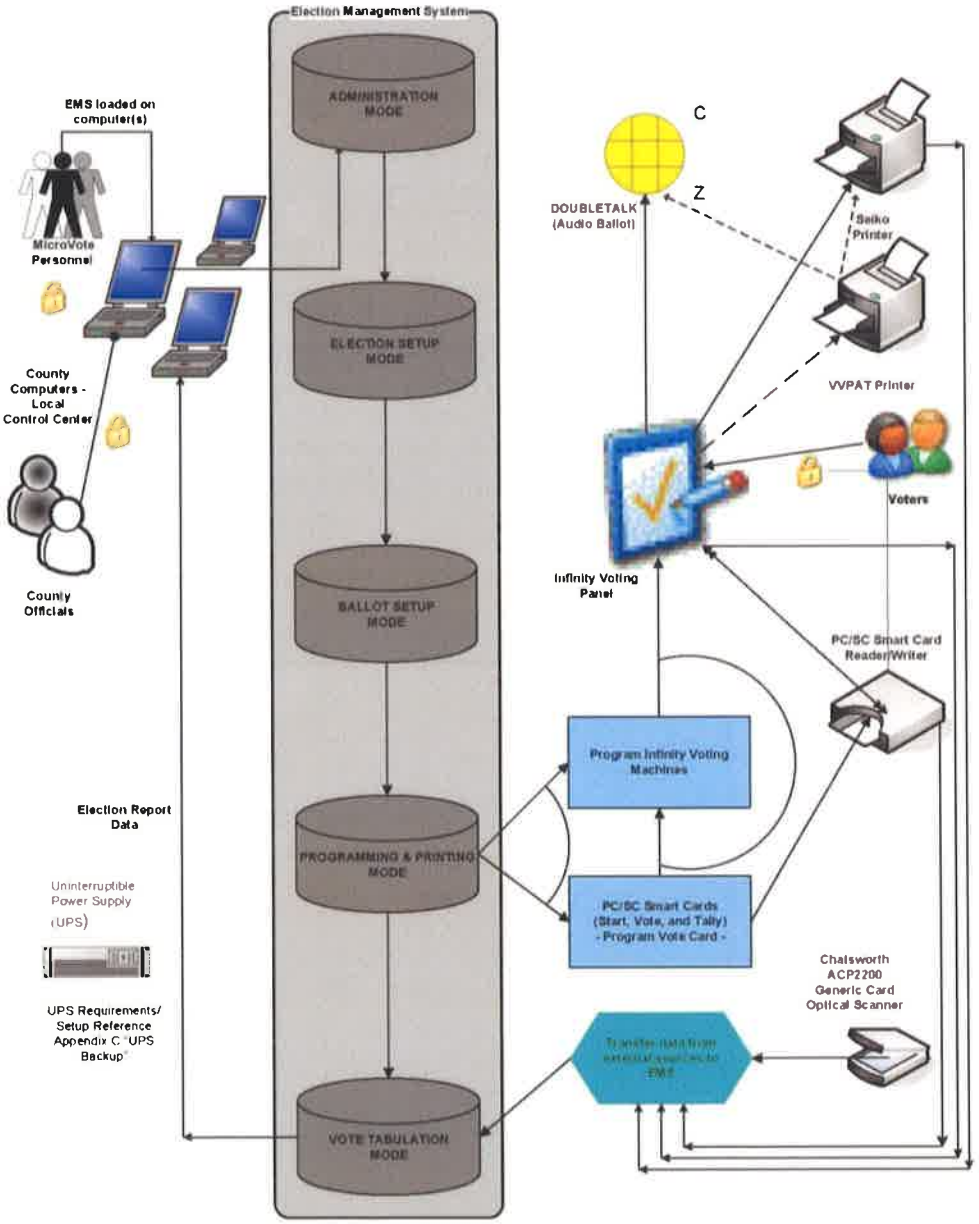
The MicroVote EMS 4.41 software functionality is divided by activity, based on each stage of the election. These activities are further divided into five modes, all building on each other to complete the election process: Administration, Election Setup, Ballot Setup, Programming & Printing, and Vote Tabulation.

The EMS software supports the MicroVote Infinity voting panel. This panel is a direct recording electronic (DRE) device, and is connected to EMS via a serial port. Data/Vote tabulations exchange between the EMS and the Infinity machine is done directly through the serial port or

via a Smart Card programmed for each election. OMR Ballot Cards, sometimes referred to as Absentee Cards, are optically scanned by a Chatsworth ACP 2200 reader.

Several COTS hardware items and software are used with the EMS software. EMS is designed to be used with Microsoft Windows 10 Pro X86/X64, and is installed on a Dell computer desktop and/or laptop. The database software is SQL Server 2017 Express. There is a COTS DOUBLETALK LT text-to-speech converter box attached to the Infinity machine. There are also COTS Smart Cards and Smart Card readers/writers. All OMR/Absentee ballot cards are optically scanned by the ACP 2200 reader.

System Diagram



Certified System before Modification (If applicable):

- EMS Release 4.0 Certificate ID: MVTEMS40
- EMS Release 4.0B Certificate ID: MVTEMS40B
- EMS Release 4.1 Certificate ID: MVTEMS41
- EMS Release 4.2 Certificate ID: MVTEMS42
- EMS Release 4.3-A Certificate ID: MVTEMS43A
- EMS Release 4.4 Certified ID: MVTEMS44

Language capability:

English, Spanish and an optional third language (including pictographic / character languages)

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 4.4	EMS Software V4.4.8.0	N/A	--	MicroVote EMS 4.4
EMS Server Dell Desktop		Dell Optiplex GX520, 3010, or 3020		MicroVote EMS 4.2
Microsoft SQL Server Express 2017	Express 17		--	
Microsoft Windows 10 Professional	10 Professional ver 1909		--	
Laptop(s) Dell		Dell Latitude E5440, E5570, E5580, 3500		
Infinity Model VP 1 Voting Panel	Firmware V4.3 (Rev D) V4.4 (Rev E)	Rev D or Rev E	--	Rev D – 4.2
VVPAT Printer	N/A	Rev A		
Scanner Dual Sided Chatsworth ACP 2200	N/A	Model 605000-190	--	All Certified Systems

System Component	Software or Firmware Revision	Hardware Revision	COTS Information	Dependency Notes
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		HWP109380 B	PC/SC compatible USB contact reader/writer	MicroVote EMS 4.2
Smart Cards	N/A	16K or 115K	--	
Voting Booth	N/A	Model 2000	--	All Certified Systems
MinuteMan UPS	N/A	EP1000LCD	UPS	
APC Back-UPS Pro	N/A	BN1100M2, BX1000M	UPS	
Hamilton Buhl Headphones	N/A	PRM100B	Headphones	
Head Stick	N/A		Pointer for ADA voters.	

System Limitations

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

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
Maximum Ballot Positions	Ballot Design Form	150	600	600	402
Maximum Precincts in Election	Precinct Number	600	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	300	599	599	402
Maximum Candidates/ Counters in Activation	Ballot Design Form	300	599	599	402

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
Maximum Ballot Styles in Election	Ballot Style Number	300	1000	9999	1000
Maximum Contests in a Ballot Style	Ballot Design Form	100	300	300	201
Maximum Candidates in a Contest	Ballot Design Form	10	599	599	401
Maximum Count for any Precinct Element	Transact-SQL Bigint	600	See Note 1	65,000	See Note 1
Maximum Ballot Styles in a Precinct	Precinct Style Assignment Form	1	1	1	1
Maximum Activations per Ballot Style	Build Activations Form	25	99	30	99
Maximum Activations per Election	Act/Ballot Style * Ballot Style/Elec	1500	99,000	299,970	299,970
Maximum Number of Parties	Party Code Combinations	10	50,653	598	400
Maximum Vote For in Contest	Office Vote Limit	60	99	64	99

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

Functionality

2005 VVSG Supported Functionality Declaration

Feature / Characteristic	Yes / No	Comment
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open - Public Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. Choice of party ballot at the polling place, after which the poll worker provides or activates the appropriate ballot.	Yes	
Primary: Open - Private Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. The voters chooses the party ballot within the privacy of the voting booth.	No	
Partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	

Feature / Characteristic	Yes / No	Comment
Handles partisan contests in a primary election	Yes	
Handles partisan contests in a general election	Yes	
Non-partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	
Handles non-partisan contests in a primary election	Yes	
Handles non-partisan contests in a general election	Yes	
Write-In Voting:		
A separate voting position is identified for write-ins.	Yes	
Write-in for an N of M contest has M write-in positions.	Yes	
Write-in with no candidates (partisan & non-partisan contests)	Yes	
Method to flag write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations		
Slates of delegates are displayed for each presidential primary candidate	Yes	Use the Ballot text features to create a slate
Slates of delegates are chosen with one selection.	Yes	
Ballot Rotation:		
Names of candidates rotate.	No	
Straight Party Voting:		
Make one selection to vote for all candidates of one party in a general election	Yes	
Undervote the straight party selection and choose each candidate individually	Yes	
Vote straight party and then change votes to cross over to another party's candidate.	Yes	
Vote straight party for a party without a candidate in one of the races.	Yes	
Votes straight party in an: N of M contest (N>1)	Yes	
Cross-Party Endorsement:		
One candidate is endorsed by multiple parties.	Yes	Set up the candidate for each party. Manually combine votes in the canvas.
Cross Party Endorsement is supported in straight party contests	Yes	

Feature / Characteristic	Yes / No	Comment
Split Precincts:		
Precincts splits with multiple ballot styles	Yes	
The number of voters are identified for the precinct split.	Yes	
The vote totals are not reported for the precinct split.	Yes	
Ballot faces match the correct contests and ballot identification for each split.	Yes	
The correct contests are presented for the appropriate ballot split.	Yes	
Vote N of M:		
Counts each selected candidate, if less than or equal to "M" candidates are selected. (Overvote if >M)	Yes	
Identifies an undervote if less than "M" candidates are selected.	Yes	
Recall Issues, with options:		
The recall vote is a Yes or No question.	No	
The recall is a vote for 1 of M vote with the Retain one choice and each replacement candidate a separate choice.	No	
Two contests are on the ballot. The voter must vote Yes to a recall in order to vote in the second contest for the replacement candidate. A No, undervote or overvote will not allow a vote in the second contest to be counted.	No	
Two contests are on the ballot. If a voter votes Yes or No they may vote in the second contest for the replacement candidate. An undervote or overvote will not allow a vote in the second contest to be counted.	No	Functionality overturned - US District Court 7/29/03: CA Election Code sect. 11383
Cumulative Voting		
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	
Ranked Order Voting		
Voters rank candidates in a contest in order of choice (1, 2, 3, etc.)	No	
A write in vote can be ranked.	No	
Tabulation of Ranked Order Votes		
Ballots are sorted according to the 1st ranked choice. If no candidate receives a majority of first ranked choice the candidate with the least 1st ranks is eliminated. Votes are recounted and are distributed to the remaining candidates according to the 2nd ranked choice. If still no candidate has	No	

Feature / Characteristic	Yes / No	Comment
a majority, the candidate with the process repeats to next rank choice s until a candidate has obtained a majority.		
A ballot is no longer counted if all ranked choices have been eliminated	No	
Once candidates are eliminated, no votes can be transferred to them. Ballots being recounted, which identify an eliminated candidate, go to the next ranked candidate.	No	
If a rank is skipped, the vote for the next rank is counted.	No	
Provisional or Challenged Ballots		
Provisional ballots maintain the secrecy of the ballot.	Yes	
A voted provisional ballot, that is not included in the poll close report, can be identified for determination.	Yes	
Valid provisional votes can be added in the central count report.	Yes	
A voted provisional ballot, which is included in the poll close report, can be identified and subtracted in the central count.	Yes	
Secondary Vote Limit		
A voting variation outside the VVSG, which is supported by an additional vote limit that can be placed on grouped contests, so that multiple limits are placed on the vote.	Yes	

Baseline Certification Engineering Change Orders (ECO)

This table depicts the ECOs certified with the voting system:

Change ID	Date	Component	Description	Inclusion
ECN 130	09/15/20	Dell Laptop	Replace end of life laptop (3500) with current model (Dell Latitude 3510)	DeMinimis

6705 Odyssey Drive
Suite C
Huntsville, AL 35806
Phone (256)713-1111
Fax (256)713-1112

Test Report for EAC 2005 VVSG 1.0 Certification Testing MicroVote EMS 4.41 Voting System

EAC Project Number: MVTEMS441

Version: 02

Date: 09/04/2020

U.S. Election Assistance Commission

VSTL

EAC Lab Code 1501

NVLAP®

NVLAP LAB CODE 200908-0

SIGNATURES

Approved by: Michael L. Walker — 09/04/2020

Michael Walker, VSTL Project Manager — Date

Approved by: Wendy Owens — 09/04/2020

Wendy Owens, VSTL Program Manager — Date

REVISIONS

Revision	Description	Date
00	Initial Release	08/25/2020
01	Updated to resolve EAC comments	08/28/2020
02	Final Version with highlights removed	09/04/2020

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this Test Report is to document the procedures that Pro V&V, Inc. followed to perform certification testing during a system modification campaign for the MicroVote EMS 4.41 Voting System to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG), Version 1.0. Certification testing of EMS 4.41 was performed to ensure the applicable requirements of the EAC VVSG 1.0 and the EAC Testing and Certification Program Manual, Version 2.0 were met. Additionally, all EAC Request for Interpretations (RFI) and Notices of Clarification (NOC) relevant to the system under test were incorporated in the test campaign.

Prior to submitting the voting system for testing, MicroVote submitted an application package to the EAC for certification of the EMS 4.41 Voting System. The application was accepted by the EAC and the project was assigned the unique Project Number of MVTEMS441.

The EMS 4.41 EAC-approved test plan, which is available for viewing on the EAC's website at www.eac.gov, was utilized as the guiding document during test performance. Since test plan approval, and as testing progressed, minor system modifications, such as revised system documentation, were incorporated. This test report reflects all of the testing completed and details the final versions of all technical documentation and system components and supersedes the approved test plan.

Unless otherwise annotated, all testing was conducted at the Pro V&V test facility located in Huntsville, AL, by personnel verified by Pro V&V to be qualified to perform the test.

1.1 Description and Overview of EAC Certified System Being Modified

EMS 4.41 is a modification to a previously certified system and has not yet been fielded. The EMS 4.41 software functionality is divided by activity, based on each stage of the election. These activities are further divided into five modes, all building on each other to complete the election process: Administration, Election Setup, Ballot Setup, Programming & Printing, and Vote Tabulation. These modes combined, working together capture:

- Creating and maintaining default preferences and settings for a specific jurisdiction.
- Creating and maintaining preferences and settings for an election.
- Creating and maintaining security clearances for all users of EMS.
- Creating primary, general or both types of elections or municipal elections.
- Creating offices and filing candidates.
- Creating and maintaining all objects appearing on the ballot.
- Printing ballots.
- Programming voting devices.

- Printing reports of election data.
- Tallying election results.
- Generating reports of election results for state reporting systems, media displays, or printing.
- Creating and restoring backup files of election databases for archival purposes

The Administration mode is the system setup stage. This mode includes: Preferences, Political Parties, Vote Types, Precincts, Ballot Text, Ballot Graphics, Equipment, Equipment Assignment, and Security. Election Setup Reports reflecting each form are also available.

The Election Setup, Ballot Setup, and Programming & Printing modes are all pre-election activities. The Election Setup includes entering offices, filing candidates, creating secondary vote lockouts. In Ballot Setup, users create and edit ballots, build activations, and assign precincts. Programming & Printing includes programming voting machines and Smart Cards, previewing and printing ballots, and assigning voting panels to locations.

Phonetics, text-to-speech, option is built into EMS. All pronunciation of words, names or phrases can be altered for better listening comprehension. Reports are available for Election and Ballot setup for further election setup auditing.

EMS 4.41 includes support for an optional Voter Verifiable Printed Audit Trail (VVPAT) printer to be attached to the MicroVote Infinity voting panel. The EMS user can set the number of allowed voter voids (1-5) during the voting session and optional QR code printed on each ballot which contains ballot header information and ballot selections.

The Vote Tabulation mode is the final mode during which all tabulations and final results are produced. Election Night Reporting mode reports reflect the results as they are tabulated.

The EMS software supports the MicroVote Infinity voting panel with optional VVPAT printer attached. This panel is a direct recording electronic (DRE) device, and is connected to EMS via a serial port. Data/Vote tabulations exchange between the EMS and the Infinity machine is done directly through the serial port or via a Smart Card programmed for each election. OMR Ballot Cards, sometimes referred to as Absentee Cards, are optically scanned by a Chatsworth ACP 2200 reader.

Several COTS hardware items and software are used with the EMS software. EMS is designed to be used with Microsoft Windows 10 Pro X86/X64, and is installed on a Dell computer desktop and/or laptop. The database software is SQL Server 2017 Express. There is a COTS DOUBLETALK LT text-to-speech converter box attached to the Infinity machine. There are also COTS Smart Cards and Smart Card readers/writers. All OMR/Absentee ballot cards are optically scanned by the ACP 2200 reader.

1.1.1 Baseline Certified System

The EAC Certified System that is the baseline for the submitted modification is described in the following subsections. All information presented was derived from the previous Certification Test Report, the EAC Certificate of Conformance and/or the System Overview.

The EAC-certified system that is the baseline system for this modification is the EMS 4.4 Voting System. The tables below describe the certified equipment and firmware versions. Detailed descriptions of the EMS 4.4 test campaign are contained in Pro V&V Report No. TR-01-01-MVT-002-01.01, which is available for viewing on the EAC's website at www.eac.gov.

Table 1-1. EMS 4.4 System Components

EMS 4.4 SYSTEM SOFTWARE	
Firmware/Software	**Version**
Proprietary	
Election Management Software (EMS)	4.4
Infinity Panel Rev. D	4.30
Infinity Panel Rev. E	4.40
COTS	
Microsoft Windows 10 Professional	1909
Microsoft Visual Studio 2017 Professional	15.9
ComponentOne Ultimate 2014	1
Advanced Installer	16.4.1
Advanced Installer Extension for Visual Studio 2017	16.5
EMS 4.4 SYSTEM HARDWARE	
Component	**Serial Number**
Proprietary	
Infinity Voting Panel (Rev D) w/Power Supply	11588
Infinity Voting Panel (Rev E) w/Power Supply	14009, 14010
VVPAT (Rev A) w/Power Supply	001011, 001100
COTS	
Tripp Lite Portable Surge Protector (TRAVELCUBE)	[MVT-TC-001], [MVT-TC-002]
Minuteman UPS (EP1000LCD)	AK11190890004

Table 1-1. EMS 4.4 System Components (continued)

Component	Serial Number
APC Back-UPS Pro (BN1100M2)	3B1925X63177, 3B1925X63227
Dell Latitude 5580 Laptop w/Power Supply	51LG8H2, 5DL1RN2
USB Smart Card Reader (PC USB TR PIV) w/Stand (HWP109380 B)	113101316600170
EMS Download Cable	CC06789-06, [MVT-DC-001]
USB-RS232 Converter	USA000106043, USA000155787
Seiko Instruments Printer (DPU-3445) w/Power Supply	2008922A
DoubleTalk LT	[MVT-DT-001]
Hamilton Buhl (PRM100B)	[MVT-HB-001]
Chatsworth Data (ACP-2200)	CDT021901537, CDT121901544
Head Stick	[MVT-HS-001]

1.2 References

- Election Assistance Commission 2005 Voluntary Voting System Guidelines (VVSG) Version 1.0, Volume I, "Voting System Performance Guidelines"
- Election Assistance Commission 2005 Voluntary Voting System Guidelines (VVSG) Version 1.0, Volume II, "National Certification Testing Guidelines"
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-2016, "NVLAP Procedures and General Requirements (NIST Handbook 150-2016)", dated July 2016
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)", dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Pro V&V, Inc. Quality Assurance Manual, Revision 7.0
- Election Assistance Commission "Approval of Voting System Testing Application Package" letter dated August 24, 2020
- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)

- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- MicroVote EMS 4.41 Technical Data Package *(A listing of the EMS 4.41 documents submitted for this test campaign is listed in Section 3.1 of this Test Report)*
- MicroVote TDP Section 2.13 System Change Notes, Election Management System, Version 1.18, dated 11/07/2019

1.3 Terms and Abbreviations

This subsection lists terms and abbreviations relevant to the hardware, the software, or this Test Report.

"COTS" – Commercial Off-The-Shelf

"DRE" – Direct Record Electronic

"EAC" – United States Election Assistance Commission

"EMS" – Election Management System

"FCA" – Functional Configuration Audit

"HAVA" – Help America Vote Act

"NIST" – National Institute of Standards and Technology

"NOC" – Notice of Clarification

"NVLAP" – National Voluntary Laboratory Accreditation Program

"PCA" – Physical Configuration Audit

"QA" – Quality Assurance

"RFI" – Request for Interpretation

"TDP" – Technical Data Package

"VSTL" – Voting System Test Laboratory

"VVPAT" – Voter Verifiable Paper Audit Trail

"VVSG" – Voluntary Voting System Guidelines

2.0 CERTIFICATION TEST BACKGROUND

EMS 4.41 is a modification of a previously certified system (EMS 4.4).

Pro V&V performed an evaluation of results from the previous test campaign to determine the scope of testing required for certification of the EMS 4.41. Based on this evaluation, Pro V&V

determined that testing from the previous test campaign would establish the baseline and that the focus of this test campaign would be on the documented system updates.

No prior non-VSTL testing of the EMS 4.41 modifications were considered for this test campaign.

2.1 Revision History

The table below details the version history of the EMS 4.41 System:

Table 2-1. EMS 4.41 System Revision History

System Version	Certification Type	Baseline System	Certification Number
EMS 4.0	New System	--- (Original System)---	MVTEMS4
EMS 4.0B	Modification	EMS 4.0	MVTEMS40B
EMS 4.1	Modification	EMS 4.0B	MVTEMS41
EMS 4.2	Modification	EMS 4.1	MVTEMS42
EMS 4.4	Modification	EMS 4.2	MVTEMS44
EMS 4.41	Modification	EMS 4.4	MVTEMS441*

*Upon grant of certification by the EAC

2.2 Scope of Testing

The scope of testing was limited to the modifications made to the previously certified EMS 4.4 Voting System. Prior to test initiation, Pro V&V performed an evaluation of the results from the previous test campaign along with the changes made to the system to determine the scope of testing required for certification of the EMS 4.41. Based on this evaluation, Pro V&V determined that testing from the previous test campaigns would establish the baseline and that the focus of this test campaign would be on the system updates.

It was determined the following tasks would be required to verify compliance of the modifications:

- Technical Data Package (TDP) Review

  A limited TDP Review was performed to ensure that all submitted modifications were accurately documented and that the documents met the requirements of the EAC 2005 VVSG.

- Physical Configuration Audit (PCA)

  A PCA was performed to compare the voting system submitted for certification testing to the manufacturer's technical documentation.

- Source Code Review, Compliance Build, Trusted Build, and Build Document Review

  A source code review was performed based on the source code changes made since the previous system was certified. To perform the source code review, Pro V&V reviewed the submitted source code to the EAC VVSG 1.0 and the manufacturer-submitted coding

standards. Prior to initiating the software review, Pro V&V verified that the submitted documentation was sufficient to enable: (1) a review of the source code and (2) Pro V&V to design and conduct tests at every level of the software structure to verify that design specifications and performance guidelines are met.

- EMS and System Functional Regression Testing

  Functional Regression Testing was conducted on the EMS to establish assurance that the modifications had no adverse impact on the compliance, integrity, or performance of the system. As part of this area of testing, a smoke test was performed by executing an election utilizing every component of the previously certified equipment.

2.2.1 Modification Overview

The submitted modification for the EMS 4.41 test campaign is a source code modification to the baseline EMS 4.4 system EMS software. This modification (V4.4.7.0 -> V4.4.8.0) allows the system to display running precinct count in addition to running batch count. Revising the frmOMR.vb module in EMS V4.4.7.0 improves batch processing for scanning large numbers of mail-in absentee ballots by displaying running total of precinct ballots scanned in addition to running total for current batch of ballots being scanned. This change will make it easier to break up large numbers of received ballots to scan into smaller batches for processing while still displaying the overall number of ballots scanned for each precinct. *Note: This modification is documented in MicroVote ECN 127, which was submitted for review following final certification of EMS 4.4.*

2.2.2 System Overview

The MicroVote EMS 4.41 Voting System is comprised of the following components: EMS Software Version 4.4, Infinity Panel Rev. E, Infinity Panel Rev. D, and optional VVPAT, as described in Section 1.1 of this report. The materials identified by the manufacturer as materials deliverable to the end user for the EMS 4.41 system are identified below

Table 2-2. EMS 4.41 System Deliverables

Material	Version	Description
EMS Software	4.4	Election Management Software
Infinity Panel	Rev E	DRE precinct count/accessible voting station
Infinity Panel	Rev D	DRE precinct count/accessible voting station
VVPAT	Rev A	Voter Verifiable Paper Audit Trail

2.2.2.1 System Diagram

The system overview of the EMS 4.41 voting system is depicted in Figure 1-1.

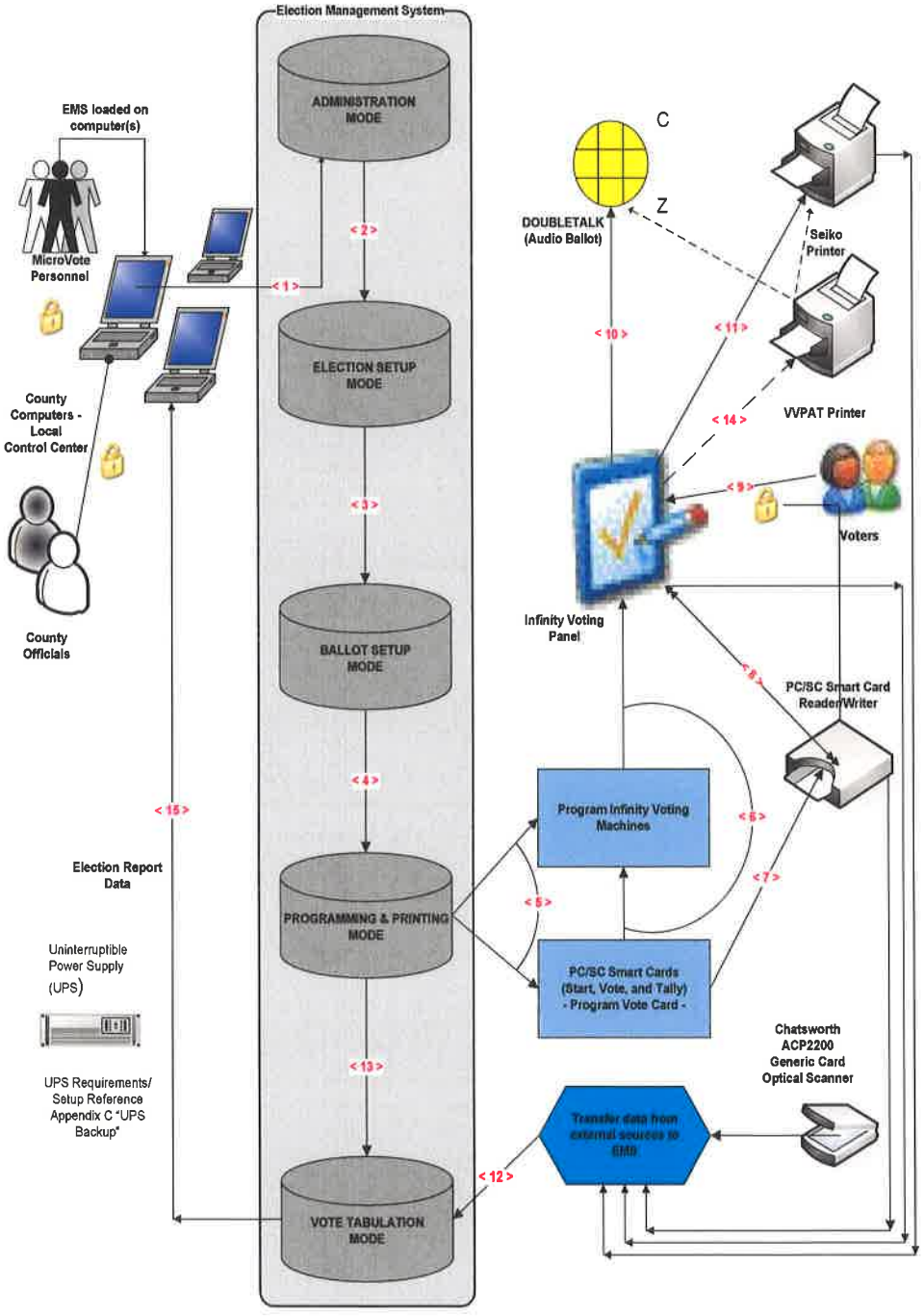


Figure 1-1. EMS 4.41 System Overview

2.2.2.2 Supported Functionality

There were no changes made to the supported functionality of the voting system. The supported functionality for the submitted voting system remains unchanged from the previously certified version.

- General Election
- Closed Primary
- Open Primary
- Partisan/Non-Partisan Offices
- Write-In Voting
- Primary Presidential Delegation Nominations
- Split Precincts
- Vote for N of M
- Provisional/Challenged Ballots
- Straight Party Voting
- Cross-party Endorsement

2.2.2.3 Supported Languages

The following languages are supported by EMS 4.41:

- English
- Spanish
- optional third language, including pictographic

Support for each stated languages was verified. Both English and Spanish language ballots were cast during the performance of functional testing. Additionally, one character based language (Chinese) was tested during System Integration Testing.

Testing of the Chinese language was accomplished through the creation and execution of both a primary and general election verifying the translations could be used by Chinese minority language voters. The translations themselves were taken from an online translator (Google Translate). The translations were then copied and pasted into the qualified EMS ballot text fields using Windows Notepad. In order for the Infinity Panel to recognize the Chinese characters, a number of special reserved ballot text objects were activated, as covered in MicroVote TDP *Appendix B: Third Language Support of the EMS User Manual*.

2.2.2.4 System Limits

There were no changes to the system limits. The system limitations supporting EMS 4.41 are provided in the table below:

Table 2-3. EMS 4.41 System Limitations

Characteristic	Limiting Component	Evaluated	Manufacturer Calculated		
			EMS	Infinity	ACP 2200
Maximum Ballot Positions	Ballot Design Form	300	600	600	402
Maximum Precincts in Election	Precinct Number	600	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	300	599	599	402
Maximum Candidates/ Counters in Activation	Ballot Design Form	300	599	599	402
Maximum Ballot Styles in Election	Ballot Style Number	300	1000	9999	1000
Maximum Contests in a Ballot Style	Ballot Design Form	100	300	300	201
Maximum Candidates in a Contest	Ballot Design Form	300	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	25	99	30	99
Maximum Activations per Election	Act/Ballot Style * Ballot Style/Elec	1500	99,000	299,970	299,970
Maximum Number of Parties	Party Code Combinations	10	50,653	598	400
Maximum Vote For in Contest	Office Vote Limit	60	99	64	99

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

2.2.3 VVSG

The EMS 4.41 Voting System was evaluated against the relevant requirements contained in the EAC 2005 VVSG, Volumes I and II.

2.2.4 RFIs

There are no RFIs released by the EAC as of the date of this Test Report that pertained to this test campaign that were not in effect at the time of the baseline system certification.

2.2.5 NOCs

There are no NOCs released by the EAC as of the date of this Test Report that pertained to this test campaign that were not in effect at the time of the baseline system certification.

3.0 TEST FINDINGS AND RECOMMENDATIONS

EMS 4.41 was evaluated against the relevant requirements contained in the EAC 2005 VVSG, Volumes I and II. The focus of this test campaign was on the modification to the voting system EMS software source code. All requirements that were excluded from the previous test campaign (EMS 4.4), were also deemed not applicable to this test campaign due to the submitted modification not impacting the specific requirements.

The summary findings and recommendations for each area of testing are provided in the following sections.

3.1 Summary Findings and Recommendation

Summary findings for the System Level Testing (FCA), PCA, and Source Code Review are detailed in the relevant sections of this report. In addition to these areas of testing, a limited TDP Review was performed, as described below.

Technical Documentation Package (TDP) Review

In order to determine compliance of the modified TDP documents with the EAC VVSG 1.0, a limited TDP review was conducted. This review focused on TDP documents that have been modified since the certification of the baseline system. The review consisted of a compliance review to verify that each regulatory, state, or manufacturer-stated requirement had been met based on the context of each requirement.

Results of the review of each document were entered on the TDP Review Checklist and reported to the manufacturer for disposition of any anomalies. This process was ongoing until all anomalies were resolved. Any revised documents during the TDP review process were compared with the previous document revision to determine changes made, and the document was re-reviewed to determine whether subject requirements had been met. A listing of all documents contained in the EMS 4.41 TDP is provided in Table 3-1.

Table 3-1: EMS 4.41 TDP Documents

Section	Description	Version
---	Technical Data Package (TDP) TABLE OF CONTENTS Election Management System	1.1
2.1	SCOPE Election Management System	1.2
2.2	SYSTEM OVERVIEW Election Management System	1.16
2.3	SYSTEM FUNCTIONALITY DESCRIPTION Election Management System	1.3
2.4	SYSTEM HARDWARE SPECIFICATION Election Management System	1.4
2.5	SOFTWARE DESIGN AND SPECIFICATION Election Management System	2.11
2.6	SYSTEM SECURITY SPECIFICATION Election Management System	1.10
2.7	SYSTEM TEST AND VERIFICATION SPECIFICATION Election Management System	1.3
2.8	SYSTEM OPERATION PROCEDURES Election Management System	1.3
2.9	SYSTEM MAINTENACE PROCEDURES Election Management System	1.4
2.10	PERSONNEL DEPOYMENT AND TRAINING REQUIREMENTS Election Management System	1.1
2.11	CONFIGURATION MANAGEMENT PLAN Election Management System	1.7
2.12	QUALITY ASSURANCE PROGRAM Election Management System	1.4
2.13	SYSTEM CHANGE NOTES Election Management System	1.18
---	Appendices TABLE OF CONTENTS Election Management System	1.9

3.1.1 Source Code Review

Pro V&V reviewed the submitted source code to the EAC VVSG 1.0 and the manufacturer-submitted coding standards. Prior to initiating the software review, Pro V&V verified that the submitted documentation was sufficient to enable: (1) a review of the source code and (2) Pro V&V to design and conduct tests at every level of the software structure to verify that design specifications and performance guidelines are met.

A combination of Automated Source Code Review and Manual Source Code Review methods were used to review the changes in the source code from the previously certified EMS 4.4 voting system. In addition, 10% of the source code comments will be manually reviewed.

Summary Findings

- Automated Source Code Review: The Automated Source Code Review was performed during the EMS 4.41 Compliance and Trusted Builds. No source code issues were found during the Automated Source Code review.

- Manual Source Code Review: The Manual Source Code review was performed on 10% of the comments for compliance to VVSG Volume Section 5.2.7. No source code issues were found during the Manual Source Code review.

- Trusted Build: The trusted build consisted of inspecting customer submitted source code, COTS, and third-party software products and combining them to create the executable code. This inspection followed the documented process from the "United States Election Assistance Commission Voting System Test Laboratory Program Manual" Section 5.5 – 5.7. Performance of the trusted build includes the build documentation review. The Trusted Build was performed following the completion of the Functional Configuration Audit.

3.1.2 Physical Configuration Audit (PCA)

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

- Establish a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system

- Verify software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification

- If the hardware is non-COTS, Pro V&V shall review drawings, specifications, technical data, and test data associated with system hardware to establish system hardware baseline associated with software baseline

- Review manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests

- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination

Summary Findings

During execution of the test procedure, the components of the EMS 4.41 system were documented by component name, model, serial number, major component, and any other relevant information needed to identify the component. For COTS equipment, every effort was made to verify that the COTS equipment had not been modified for use. Additionally, each technical document submitted in the TDP was recorded by document name, description, document number, revision number, and date of release. At the conclusion of the test campaign, test personnel verified that any changes made to the software, hardware, or documentation during the test process were fully and properly documented.

3.1.3 System Level Testing

System Level Testing was implemented to evaluate the complete system. System Level Testing for this campaign included the evaluations of the following test areas: EMS and System Functional Regression Testing. This testing included all proprietary components and COTS components (software, hardware, and peripherals) in a configuration of the system's intended use.

For software system tests, the tests were designed according to the stated design objective without consideration of its functional specification. The system level software test cases were prepared independently to assess the response of the software to a range of conditions. Pro V&V reviewed the manufacturer's program analysis, documentation, and module test case design and evaluated the test cases for each module with respect to flow control parameters and entry/exit data. As test cases were utilized throughout the test campaign and were designed based on the manufacturer's design specifications and the relevant technical requirements set forth by the VVSG. Test cases were examined based on the following aspects of the voting system: Software module test case design and data, Software functional test case design, and System level test case design.

Test cases provided information regarding the sequence of actions to be performed for the execution of a test, the requirements being met, the test objective, test configuration, equipment needed, special requirements, assumptions, and pass/fail criteria. Once the test cases were finalized, they were validated and published for use in the test campaign. The validation of the test case was accomplished by technical review and approval. This validation included the following: confirmation of adequate test coverage of the requirement being tested; confirmation that test case results were not ambiguous and gave objective pass/fail criteria; and confirmation that any automated test suites would produce valid results

Pro V&V defined the expected result for each test and the ACCEPT/REJECT criteria for certification. If the system performed as expected, the results were accepted. If the system did not perform as expected, an analysis was performed to determine the cause.
If needed, the test was repeated in an attempt to reproduce the results. If the failure could not be reproduced and the expected results were not met, the system was determined to have failed the test. If the results could not be reproduced, the test continued. All errors encountered were documented and tracked through resolution.

3.1.3.1 EMS and System Functional Regression Testing

EMS and System Functional Regression Testing was performed to ensure the submitted modification did not adversely affect the EMS 4.41 system. Throughout the test campaign, Pro V&V personnel maintained a test log identifying the system and equipment under test and any records of deviations to the test plan along with the rationale for performing the deviations. Pro V&V also utilized an internal bug tracking system to record and track all issues and/or discrepancies noted during the test campaign.

3.2 Anomalies and Resolutions

When a result is encountered during test performance that deviates from what is standard or expected, a root cause analysis is performed.

Pro V&V considers it an anomaly if no root cause can be determined. In instances in which a root cause is established, the results are then considered deficiencies. No anomalies occurred during the testing of the EMS 4.41.

3.3 Deficiencies and Resolutions

Any violation of the specified requirement or a result is encountered during testing that deviates from what is standard or expected in which a root cause is established is considered a deficiency. Upon occurrence, deficiencies are logged throughout the test campaign for disposition and resolution. No deficiencies were encountered during testing.

4.0 RECOMMENDATION FOR CERTIFICATION

The EMS 4.41, as presented for testing, successfully met the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG), Version 1.0. Additionally, Pro V&V, Inc. has determined that the EMS 4.41 functioned without issue during EMS and System Functional Regression Testing. Based on the test findings, Pro V&V recommends the EAC grant the EMS 4.41 identified in Tables 4-1 and 4-2 certification to the EAC VVSG 1.0.

Table 4-1. MicroVote EMS 4.41 Software

Firmware/Software	Version
Proprietary	
EMS	4.4
Infinity Panel Rev. D	4.30
Infinity Panel Rev. E	4.40
COTS	
Microsoft Windows 10 Professional	1909

Table 4-1. MicroVote EMS 4.41 Software *(continued)*

Firmware/Software	Version
Microsoft Visual Studio Professional 2017	15.9
ComponentOne Ultimate 2014	1
Advanced Installer	16.4.1
Advanced Installer Extension for Visual Studio 2017	16.5

Table 4-2. MicroVote EMS 4.41 Hardware

Component	Serial Number
Proprietary Hardware	
Infinity Voting Panel (Rev D) w/Power Supply	11588
Infinity Voting Panel (Rev E) w/Power Supply	14009, 14010
VVPAT (Rev A) w/Power Supply	001011, 001100
COTS Hardware	
Tripp Lite Portable Surge Protector (TRAVELCUBE)	[MVT-TC-001], [MVT-TC-002]
Minuteman UPS (EP1000LCD)	AK11190890004
APC Back-UPS Pro (BN1100M2)	3B1925X63177, 3B1925X63227
Dell Latitude 5580 Laptop w/Power Supply	51LG8H2, 5DL1RN2
USB Smart Card Reader (PC USB TR PIV) w/Stand (HWP109380 B)	113101316600170
EMS Download Cable	CC06789-06, [MVT-DC-001]
USB-RS232 Converter	USA000106043, USA000155787
Seiko Instruments Printer (DPU-3445) w/Power Supply	2008922A
DoubleTalk LT	[MVT-DT-001]
Hamilton Buhl (PRM100B)	[MVT-HB-001]
Chatsworth Data (ACP-2200)	CDT021901537, CDT121901544
Head Stick	[MVT-HS-001]

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MicroVote
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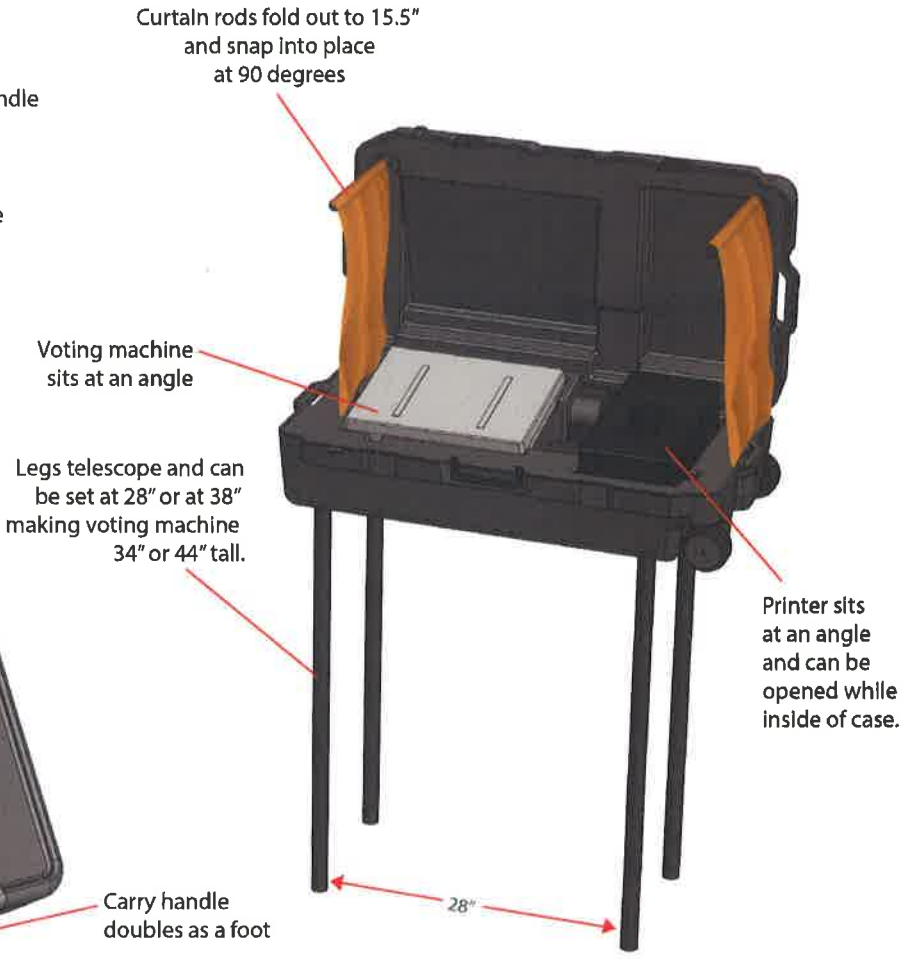
0349-0001-0000-00
8/17/20



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Estimated case size: 39" x 21" x 10"

Leg reference Images

Loop for pad lock

MicroVote logo
= PMS 151 Orange
= PMS 11 Cool Gray

Folding telescoping legs are mounted to bottom of case.

Print Name: _____ **X:** _____ **Date:** _____

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MicroVote
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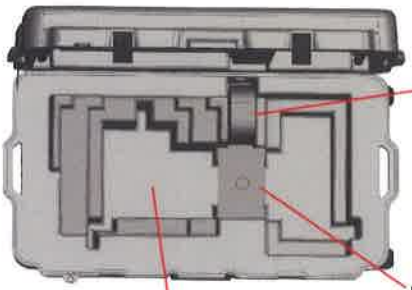
0349-0001-0000-00

8/17/20



Retractable cord reel

Area under voting machine and printer for wire storage

Plug allows for wire pass through

Cat.6 RJ45 Bulkhead Coupler mounted to plastic cover

Foam pad comes with peal and stick adhesive to apply into lid if using the Small Voting Machine

Curtains roll around rod and fold back into case

stay holds case open

Printer

Large Voting Machine

Small Voting Machine

Printer

Print Name: _____ **X:** _____ **Date:** _____

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United States Election Assistance Commission

Certificate of Conformance

MicroVote EMS 4.3-A

VVSG 2005 VER. 1

EAC CERTIFIED

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the *Voluntary Voting System Guidelines Version 1.0 (VVSG 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: EMS

Model or Version: 4.3-A

Name of VSTL: Pro V&V

EAC Certification Number: MVTEMS43A

Date Issued: January 16, 2020

Mona Harrington

Executive Director

Scope of Certification Attached

Manufacturer: *MicroVote General Corporation*
System Name: *EMS 4.3-A*
Certificate: *MVTEMS43A*

Laboratory: *Pro V&V*
Standard: *2005 VVSG*
Date: *01/16/20120*

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.

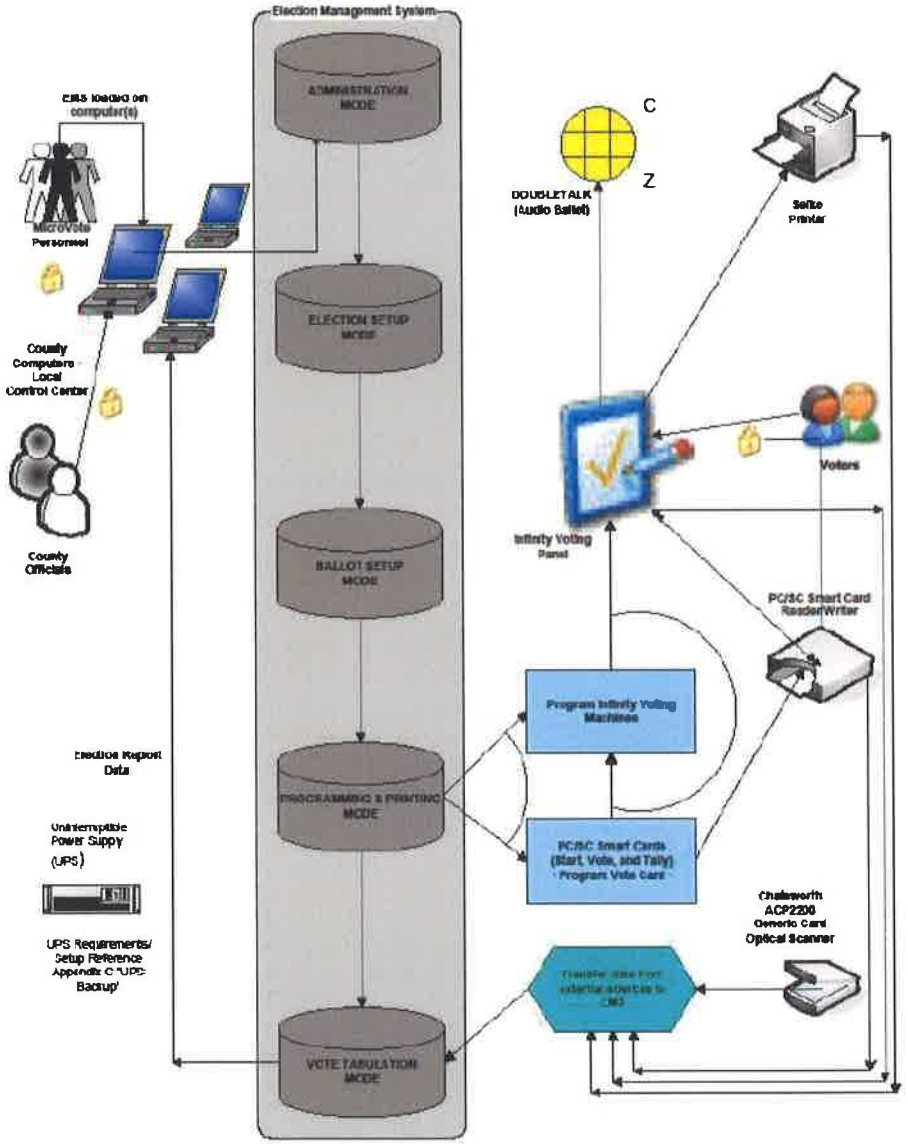
System Overview:

The MicroVote EMS 4.3-A software functionality is divided by activity, based on each stage of the election. These activities are further divided into five modes, all building on each other to complete the election process: Administration, Election Setup, Ballot Setup, Programming & Printing, and Vote Tabulation.

The EMS software supports the MicroVote Infinity voting panel. This panel is a direct recording electronic (DRE) device, and is connected to EMS via a serial port. Data/Vote tabulations exchange between the EMS and the Infinity machine is done directly through the serial port or via a Smart Card programmed for each election. OMR Ballot Cards, sometimes referred to as Absentee Cards, are optically scanned by a Chatsworth ACP 2200 reader.

Several COTS hardware items and software are used with the EMS software. EMS is designed to be used with Microsoft Windows 10 Pro X86/X64, and is installed on a Dell computer desktop and/or laptop. The database software is SQL Server 2016 Express. There is a COTS DOUBLETALK LT text-to-speech converter box attached to the Infinity machine. There are also COTS Smart Cards and Smart Card readers/writers. All OMR/Absentee ballot cards are optically scanned by the ACP 2200 reader.

System Diagram



Certified System before Modification (If applicable):

- EMS Release 4.0 Certificate ID: MVTEMS40
- EMS Release 4.0B Certificate ID: MVTEMS40B
- EMS Release 4.1 Certificate ID: MVTEMS41
- EMS Release 4.2 Certificate ID: MVTEMS42

Language capability:

English, Spanish and an optional third language (including pictographic / character languages)

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 4.3	EMS Software V4.3.6	N/A	--	MicroVote EMS 4.2
EMS Server Dell Desktop		Dell Optiplex GX520, 3010, or 3020		MicroVote EMS 4.2
Microsoft SQL Server Express 2016	Express 16		--	
Microsoft Windows 10 Professional	10 Professional		--	
Laptop(s) Dell		Dell Latitude E5440, E5570, E5580		
Infinity Model VP 1 Voting Panel	Firmware V4.3	Rev C or Rev D.05	--	Rev C – All Rev D.05 EMS4.2
Scanner Dual Sided Chatsworth ACP 2200	N/A	Model 605000-190	--	All Certified Systems
Printer Seiko	N/A	COTS Model DPU-414 or DPU-3445	--	All Certified Systems

System Component	Software or Firmware Revision	Hardware Revision	COTS Information	Dependency Notes
Doubletalk Model LT3	BIOS0212	V1.0 LT RC8650	--	All Certified Systems
Smartcard Reader		HWP109380	PC/SC compatible USB contact reader/writer	MicroVote EMS 4.2
Smart Cards	N/A	16K or 115K	--	
Voting Booth	N/A	Model 2000	--	All Certified Systems

System Limitations

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

Characteristic	Limiting Component	Evaluated	EMS	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	See Note 1	65,000	See 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

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
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

2005 VVSG Supported Functionality Declaration

Feature / Characteristic	Yes / No	Comment
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open - Public Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. Choice of party ballot at the polling place, after which the poll worker provides or activates the appropriate ballot.	Yes	
Primary: Open - Private Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. The voters chooses the party ballot within the privacy of the voting booth.	No	
Partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	
Handles partisan contests in a primary election	Yes	
Handles partisan contests in a general election	Yes	
Non-partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	
Handles non-partisan contests in a primary election	Yes	
Handles non-partisan contests in a general election	Yes	
Write-In Voting:		
A separate voting position is identified for write-ins.	Yes	
Write-in for an N of M contest has M write-in positions.	Yes	

Feature / Characteristic	Yes / No	Comment
Write-in with no candidates (partisan & non-partisan contests)	Yes	
Method to flag write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations		
Slates of delegates are displayed for each presidential primary candidate	Yes	Use the Ballot text features to create a slate
Slates of delegates are chosen with one selection.	Yes	
Ballot Rotation:		
Names of candidates rotate.	No	
Straight Party Voting:		
Make one selection to vote for all candidates of one party in a general election	Yes	
Undervote the straight party selection and choose each candidate individually	Yes	
Vote straight party and then change votes to cross over to another party's candidate.	Yes	
Vote straight party for a party without a candidate in one of the races.	Yes	
Votes straight party in an: N of M contest (N>1)	Yes	
Cross-Party Endorsement:		
One candidate is endorsed by multiple parties.	Yes	Set up the candidate for each party. Manually combine votes in the canvas.
Cross Party Endorsement is supported in straight party contests	Yes	
Split Precincts:		
Precincts splits with multiple ballot styles	Yes	
The number of voters is identified for the precinct split.	Yes	
The vote totals are not reported for the precinct split.	Yes	
Ballot faces match the correct contests and ballot identification for each split.	Yes	
The correct contests are presented for the appropriate ballot split.	Yes	
Vote N of M:		
Counts each selected candidate, if less than or equal to "M" candidates are selected. (Overvote if >M)	Yes	
Identifies an undervote if less than "M" candidates are selected.	Yes	
Recall Issues, with options:		

Feature / Characteristic	Yes / No	Comment
The recall vote is a Yes or No question.	No	
The recall is a vote for 1 of M vote with the Retain one choice and each replacement candidate a separate choice.	No	
Two contests are on the ballot. The voter must vote Yes to recall in order to vote in the second contest for the replacement candidate. A No, undervote or overvote will not allow a vote in the second contest to be counted.	No	
Two contests are on the ballot. If a voter votes Yes or No they may vote in the second contest for the replacement candidate. An undervote or overvote will not allow a vote in the second contest to be counted.	No	Functionality overturned - US District Court 7/29/03: CA Election Code sect. 11383
Cumulative Voting		
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	
Ranked Order Voting		
Voters rank candidates in a contest in order of choice (1,2,3,etc.)	No	
A write in vote can be ranked.	No	
Tabulation of Ranked Order Votes		
Ballots are sorted according to the 1st ranked choice. If no candidate receives a majority of first ranked choice the candidate with the least 1st ranks is eliminated. Votes are recounted and are distributed to the remaining candidates according to the 2nd ranked choice. If still no candidate has a majority the candidate with the process repeats to next rank choice s until a candidate has obtained a majority.	No	
A ballot is no longer counted if all ranked choices have been eliminated	No	
Once candidates are eliminated no votes can be transferred to them. Ballots being recounted which identify an eliminated candidate go to the next ranked candidate.	No	
If a rank is skipped the vote for the next rank is counted.	No	
Provisional or Challenged Ballots		
Provisional ballots maintain the secrecy of the ballot.	Yes	
A voted provisional ballot that is not included in the poll close report can be identified for determination.	Yes	
Valid provisional votes can be added in the central count report.	Yes	
A voted provisional ballots which is included in the poll close report can be identified and subtracted in the central count.	Yes	

Feature / Characteristic	Yes / No	Comment
Secondary Vote Limit		
A voting variation outside the VVSG, which is supported by an additional vote limit that can be placed on grouped contests, so that multiple limits are placed on the vote.	Yes	

Baseline Certification Engineering Change Orders (ECO)

There are currently no ECOs certified with the voting system.

Sexual Harassment Training for Administrators and County Election Commission Members

January 11, 2021

- Presenter - Chairman Barrett
  - County Survey Responses

County Name	Staff Member Responding	Does your county offer workplace harassment training?	If yes, how often is training given?	Have you, as Administrator of Elections, attended this type of training?	If yes, date of last training.	Have your staff members attended this type of training?	If yes, date of last training.	Have your county election commission members received workplace harassment training?	If yes, date of last training.	If your commissioners have not been trained, may your county election commission members attend your county offered training?	Does your county maintain documentation of individuals who have received this training?	If yes, what office maintains this information?
Anderson	M. Stephens	No		No		No		No		No	No	
Bedford	Summer Leverette	Yes	once a year	Yes	last year	Yes	last year	No		Yes	Yes	I'm not sure. The county mayors office conducts the training
Benton	Mark Ward	Yes	n/a	No		No		No		Yes	Yes	County Mayor
Bledsoe	Lisa Wheeler	No		No		No		No		No	No	
Blount	Susan knopf	Yes	Once a year	Yes	Fall 2019	Yes	Fall 2019	No		Yes	Yes	Human resources
Bradley	Fran Green	No		No		No		No		Yes	No	
Campbell	ANN AYERS-COLVIN	No		Yes	When I worked for Governor Sundquist we had more than one I think maybe every year of that administration. I haven't had anything since that time.	No		Yes	Many Years ago they can't remember the dates	No	No	
Cannon	Matt Teply	No		No		No		No		Yes	No	
Carroll	Deputy	No		No		No		No		Yes	No	
Carter	Tracy Harris	No	Our County at one time did, but don't now	Yes	It was about 12 years ago	No		Yes	3 has for sure but it's been probably been 15 years ago before they retired	No	No	
Cheatham	Pam Frejosky	Yes	Annually	No	Training was scheduled for March 26th but canceled due to CV19 closures	No		No		Yes	Yes	Human Resources
Chester	Kathy Vest	No		No		No		No		Yes	No	
Claiborne	Carolyn O'Dell	No		No		No		No		Yes	No	
Clay	Admin Wanda Daniels	No		No		No		No		Yes	Yes	County mayor Office
Cocke	Josh Blanchard	No		No		No		No	Never offered	Yes	No	n/a never offered
Coffee	Andy Farrar	Yes	Yearly per HR	Yes	March 6, 2019	No		No		Yes	Yes	Human Resource Office
Crockett	LORI LOTT	No		No		No		No		Yes	No	
Cumberland	Jill Davis	Yes	Annually	Yes	August 13, 2019	Yes	August 13, 2019	No		Yes	Yes	Human Resource Department
Davidson	Jeff Roberts	Yes	Mandatory with refreshers	Yes	No date given	Yes	No date given	No	N/A	Yes	Yes	Human Resources
Decatur	Teresa Bedingfield	No		No		No		No		Yes	No	
DeKalb	Dennis Stanley	No		No		No		No		Yes	No	It would be County Mayor's HR employee...handbooks etc are available but no formal training is offered without asking

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Dickson	Roxanne Hagewood	No		No		No		No		Yes	No	
Dyer	anita fowlkes	No		No		No		No		No	No	
Fayette	Josh Tapp	No		No		No		No		No	No	
Fentress	Lacey	Yes	Human Resources has sent us the training video to watch. It will be available to all in a few weeks.	No		No		No		Yes	Yes	When training is completed, the Election Office and Human Resource will have this information. (The sign in sheet that we are required to sign that we completed this training.)
Franklin	Margaret Ottley	Yes	Only to new hires, most haven't taken it	No		No		No		Yes	Yes	Finance Office
Gibson	Julieanne Hart	No		No		No		No		No	No	
Giles	Zena Dickey	Yes	There is a cd that the EMS office has and we can pick it up	No		No		No		Yes	Yes	The cd comes from the EMS office but I do not know if they keep a log of who takes it or not.
Grainger	Gina Hipsher	Yes	Annually	Yes	July 2019	Yes	July 2019	No	N/A	Yes	Yes	County Mayor's Office
Greene	Donna A. Burgner	Yes	once a year	Yes	Computer Based Training May 2019	Yes	Computer Based Training May 2019	No		No	Yes	Human Resources
Grundy	Garry Miller	No		No		No		No		No	No	
Hamblen	Jeff Gardner	No		No		No		No		Yes	No	
Hamilton	Kerry Steelman	Yes	Annually	Yes	11/14/2019	Yes	01/09/20	No		Yes	Yes	Hamilton County Human Resources
Hancock	Sue Greer	No		No		No		No		Yes	No	
Hardeman	Amber Moore	No		No		No		No		No	No	
Hardin	Jeanette Cronise	No		No		No		No		No	No	

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Hawkins	Crystal Rogers	No		No		No		No		Yes	Yes	Mayor's office is implementing but put on hold due to COVID-19 pandemic. Last 2 questions I answered for when this is implemented.
Haywood	Andrea Smothers	No		No		No		No		No	No	
Henderson	Robin Powers	No		Yes	Yes as an employee of the Henderson County School System	Yes	August 2018	No		Yes	No	
Henry	DeLaina Green	No		No		No		No		No	No	
Hickman	MARTIE DAVIS	No		No		No		No		Yes	Yes	COUNTY MAYOR
Houston	Annette Pulley	No		No		No		No		Yes	No	
Humphreys	JoAnn Bullion	No		No		No		No		Yes	No	
Jackson	Clay Thaxton	No	n/a	No	I have not attended one	No	n/a	No	n/a	Yes	No	n/a
Jefferson	Charles Gibson	No		No		No		No		No	No	
Johnson	Cheri Lipford	No	It is in the employee handbook given to full time employees	No		No		Yes	They have at their professional jobs in the past, date is not known.	Yes	Yes	Veterans and Safety-Karen Manuel (423) 727-7929
Knox	Clifford A. Rodgers	Yes	Quarterly	No	N/A	No	N/A	No	N/A	Yes	Yes	Human Resources
Lake	Michelle Morgan	No		No		No		No		Yes	No	
Lauderdale	Cinda Tillman	Yes	As needed	No		No		No		Yes	Yes	County Mayor , Election Commission
Lawrence	Tanya White	No		No		No		No		No	No	
Lewis	Rusty Isbell	No		No		No		No		Yes	No	
Lincoln	Shelia Allen	Yes	Every year	Yes	2018 Power Point Presentation	No		No		Yes	Yes	Emergency Management Agency

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Loudon	Susan Harrison	Yes	This is given out in the employee handbook. This would not be offered to election workers since they are not considered full or part time employees by the county.	Yes	When they handed out the last employee handbook	Yes	When they last updated the employee handbook	Yes	When they received their last employee handbook	Yes	Yes	Human resource person
Macon	Barry Doss	Yes	New Hire	Yes	New Hire	Yes	New Hire	No		Yes	Yes	Federal Insurance and HR Clerk for Macon County
Madison	Kim Buckley	No	I don't know. Not sure if they have training or not.	No	N/A	No	N/A	No	N/A	Yes	No	Human Resources, I would assume.
Marion	Kyra Inglis	No	n/a - there is a policy in a county handbook	No	n/a	No	n/a	No	n/a	No	No	n/a
Marshall	Andrew Robertson	No		No		No		No		No	No	
Maury	Todd Baxter	Yes	When an employee is hired	Yes	03/16/2016	Yes	03/16/2016	No		No	Yes	Human Resource
McMinn	TeAnna McKinney	No		No		No		No		Yes	Yes	Certificates of Training maintained in the Finance Office
McNairy	Joanie Collins	No		No		No		No		No	No	
Meigs	Judy McAllister	No		No		No		No		Yes	No	

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Monroe	James R. Brown	Yes	Yearly or as requested by each department	No		No		No		Yes	Yes	Human Resources Office
Montgomery	Elizabeth Black	Yes	upon hiring	Yes	2008	Yes	upon their hiring	No		No	Yes	Human Resources
Moore	JIM SANDERS	No	NEVER HAS - COMMON SENSE	No	NOT HAD	No	N/A	No	N/A	No	No	
Morgan	Tim Sweat	No		No		No		No		Yes	Yes	County Executive and Finance Personnel would keep records, The last two questions are answered on the premise of once training is made available. It is a topic that is being considered in our county.
Obion	Leigh B. Schlager	Yes	Don't know	Yes	2019	Yes	2019	No		Yes	No	We didn't sign anything that I am aware of so don't know if they keep a record or not
Overton	Craig Story	No	N/A	No	N/A	No	N/A	No	N/A	No	No	N/A
Perry	Gaye Treadwell	No		No		No		No		No	No	
Pickett	Tim Clark	No		No		No		No		No	No	county does not do formal training–information is given out in employee handbook at time of hiring
Polk	Nathan Hitson	No		No		No		No		No	No	
Putnam	Debbie Steidl	Yes	once in last year	Yes	don't remember	Yes	same as mine	Yes	don't remember Jan sometime I think	Yes	Yes	County Mayor
Rhea	Tom Davis	Yes	annually	Yes	October 2019	Yes	October 2019	No		Yes	Yes	Finance office
Roane	Charles Holiway	No		No		No		No		Yes	Yes	The last two answers are based on the assumption that the county does provide the training to all employees. The records will be kept by the staff member providing the training in the county executive's office.

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Robertson	Cathy Hamsley	Yes	In a group with all Dept. Heads by the Counties Attorney	Yes	March 4, 2020	No		No		No	Yes	County Finance Dept.
Rutherford	Alan Farley	Yes	annually	Yes	July 2019	Yes	July 2019	No		Yes	Yes	Human Resources
Scott	Gabe Krahn	No	It is in the employee handbook - in great detail - given at time of employment	No		No		No		No	No	The handbook has to be signed for at time of employment.. It is kept in personal file at the Finance Department
Sequatchie	Jerrie Holland	No		No		No		No		Yes	No	
Sevier	Ed Kuncitis	No		No		No		No		No	No	
Shelby	Linda Phillips	Yes	Several times per year	Yes	Mid-2016	No		No		Yes	Yes	Shelby County Training Office
Smith	Yvonne Gibbs	No		No		No		No		Yes	No	
Stewart	Daniel Perigo	Yes	When you are hired.	Yes	~ April 2019	No		No		No	No	
Sullivan	Jason Booher	No		No		No		No		No	No	
Sumner	Lori Atchley	No		No		No		No		No	No	
Tipton	Cindy Pinner	No		No		No		No		No	No	
Trousdale	Steven Paxton	Yes	Annually	Yes		Yes		No		Yes	Yes	County mayor's office
Unicoi	Sarah Fain	No	n/a	No		No		No		No	No	
Union	Deborah Viles	No		No		No		No		Yes	No	
Van Buren	Wayne Simons	No		No		No		No		No	No	
Warren	Susie Davenport	No		No	There is a policy statement in our new hire handbook, no official training	No	There is a policy statement in our new hire handbook, no official training	No		Yes	Yes	payroll / HR

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Washington	Maybell Stewart	Yes	Once, an Employment Attorney gave an overview on harassment It is also covered the the County handbook.	Yes	2018 not sure of month or day	No		No		Yes	No	
Wayne	Lillie Ruth Brewer	No		No		No		No		No	No	
Weakley	Alex Britt	No		No		No		No		No	No	
White	Dorcas Marcum	No		No		No		No		Yes	No	
Williamson	Chad Gray	Yes	All staff had training in December of 2018, new hires are given the training during orientation.	Yes	12/6/2018	Yes	12/6/2018	No		No	Yes	Human Resources
Wilson	Phillip Warren	Yes	Annually	Yes	2019	Yes	2019	No		Yes	Yes	HR
		32/95		27/95		19/95		5 of 95				

Hart InterCivic

Request for approval – Verity Voting

De Minimis Changes

January 11, 2021

- **Pam Geppert, Senior Director of Product Management**
  - **De Minimis Change to Verify Voting – Circuit Board Component and Clerical Housekeeping of Manufacture Documentation**

(3) Alternative Part & Clerical Changes – de minimis change

This de minimis change serves two purposes:

(1) the addition of an updated circuit board component and

(2) clerical housekeeping on manufacturing documentation.

The manufacturer has released a revision of the circuit board component which offers higher reliability and performance, and which is more available for purchase than the existing part.

VERITY™

HART intercivic