Wisconsin Elections Commission

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MEMORANDUM

DATE: For the June 11, 2019 Commission Meeting

TO: Members, Wisconsin Elections Commission

FROM: Meagan Wolfe
Administrator

Prepared and Presented by:
Robert Williams, Elections Specialist
Cody Davies, Elections Specialist

SUBJECT: Election Systems and Software (ES&S)
Petition for Approval of Electronic Voting Systems
EVS 5.2.4.0 and EVS 5.3.4.0

I. Introduction

Election Systems and Software (ES&S) is requesting the Wisconsin Elections Commission ("WEC" or "Commission") approve the EVS 5.2.4.0 and EVS 5.3.4.0 voting systems for sale and use in the State of Wisconsin. These systems are an update of EVS 5.2.2.0 and EVS 5.3.2.0, systems that were approved for use in Wisconsin by the Commission on June 20, 2017. The Government Accountability Board originally approved the EVS system, with EVS 5.2.0.0 and EVS 5.3.0.0, on September 4, 2014. No electronic voting equipment may be offered for sale or utilized in Wisconsin unless first approved by the WEC based upon the requirements of Wis. Stat. § 5.91 (Appendix A). The WEC has also adopted administrative rules detailing the approval process in Wis. Admin. Code Ch. EL 7 (Appendix B).

A. EVS 5.2.4.0

EVS 5.2.4.0 is a federally tested and certified paper based, digital scan voting system powered by the ElectionWare software platform. It consists of eight major components: an election management system (EMS) server; an EMS client (desktop and/or laptop computer) with election reporting manager (ERM) software; the ExpressVote, an Americans with Disabilities

Act ("ADA") compliant vote capture device for a polling place; ExpressLink, a ballot activation code application and barcode printer combination for ExpressVote ballots; the AutoMARK, an Americans with Disabilities Act compliant ballot marking device for a polling place; the DS200, a polling place scanner and tabulator; the DS450, a mid-range scanner and tabulator for a central count location; and the DS850, a high-speed scanner and tabulator for a central count location.

Updates to the previously approved system include:

- Updated Electionware audio prompts for enhanced support of ADA voting with binary tactile device.
- New hardware version for ExpressVote, v. 2.1, which addressed end-of-life component issues.
- Resolved an issue that would truncate long candidate names instead of displaying the names in their entirety.
- New configuration options for ExpressVote, including the ExpressVote Single Table, Double Table, MXB Voting Booth, and Quad Express Cart.
- A collapsible ballot box for the DS200.

A full list of the updates to the system can be found in the U.S. Election Assistance Commission's Scope of Certification document found in Appendix C.

B. EVS 5.3.4.0

EVS 5.3.4.0 is a federally tested modification to the EVS 5.2.4.0 voting system. The modification provides support for modeming of unofficial election results from a DS200 to a Secure File Transfer Protocol (SFTP) server through public analog or wireless telecommunications networks after the polls close on Election Day. The modeming components of EVS 5.3.4.0 cannot meet federal certification standards, but the underlying voting system (EVS 5.2.4.0) is federally certified. At its May 21, 2013, meeting, pursuant to authority granted in Wis. Stat. § 5.91 and Wis. Admin. Code EL 7, the Government Accountability Board adopted testing procedures and standards pertaining to the modeming and communication functionality of voting systems that have not received EAC certification. The standards were based upon the analysis and findings outlined in a staff memorandum and detailed in the *Voting Systems Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices in Wisconsin*, which are attached as Appendix D. These rules apply to non-EAC certified voting systems, where the underlying voting system received EAC certification to either the 2002 Voting System Standards (VSS) or 2005 VVSG, but any additional modeming component does not meet the 2005 VVSG.

Updates to the previously approved system include:

- Wireless modems for unofficial results transmission upgraded to 4G technology.

II. Recommendation

WEC staff is recommending approval of both the EVS 5.2.4.0 and EVS 5.3.4.0 for sale and use in Wisconsin. Detailed recommendations are listed on pages 25 through 27 following the analysis of functional testing performed by WEC staff.

III. Background

On September 11, 2018, WEC staff received an Application for Approval of EVS 5.2.4.0. ES&S submitted complete specifications for hardware, firmware, and software related to the voting system. In addition, ES&S submitted technical manuals, documentation, and instruction materials necessary for the operation of EVS 5.2.4.0. At the same time, ES&S requested WEC staff approve the EVS 5.3.4.0 voting system. ES&S submitted technical manuals, documentation, and instruction materials necessary for the operation of EVS 5.3.4.0.

A. EVS 5.2.4.0 (base voting system)

The Voting System Test Laboratory (VSTL) responsible for testing EVS 5.2.4.0, Pro V&V, recommended on May 30, 2018 that the U.S. Election Assistance Commission (EAC) certify ES&S EVS 5.2.4.0. ES&S provided the Pro V&V report to WEC staff along with the Application for Approval of EVS 5.2.4.0. Voting systems submitted to the EAC for testing after December 13, 2007, are tested using the 2005 Voluntary Voting System Guidelines (2005 VVSG). The EAC certified ES&S EVS 5.2.4.0 on June 5, 2018 and issued certification number **ESSEVS5240**.

WEC staff conducted the voting system testing campaign for EVS 5.2.4.0 on April 8-12, 2018 in the WEC office. The campaign consisted of functional testing using three different mock election configurations, a meeting of the Wisconsin Voting Equipment Review Panel (a body that consists of local election officials and voting and disability advocates), and a public demonstration of the system.

i. Hardware Components

ES&S submitted the following equipment for testing as part of EVS 5.2.4.0:

Equipment	***Hardware Version(s)***	***Firmware Version***	***Type***
DS200	1.2.1 1.2.3 1.3	2.12.2.0	Polling Place Digital Scanner and Tabulator

DS450	1.0	3.0.0.0	Mid-range Central Count Digital Scanner and Tabulator
DS850	1.0	2.10.2.0	High-speed Central Count Digital Scanner and Tabulator
AutoMark Voter Assist Terminal (VAT)	1.0 1.1 1.3	1.8.6.1	Ballot Marking Device
ExpressVote	1.0	1.4.1.7	Universal Voting System

The following paragraphs describe the design of the EVS 5.2.4.0 hardware taken in part from ES&S technical documentation.

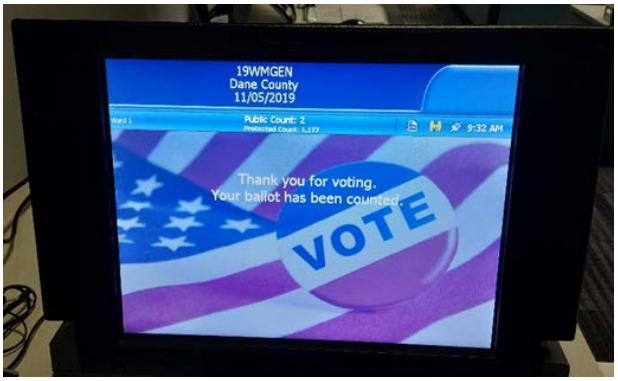
1. DS200

The DS200 is a digital scan paper ballot tabulator designed for use at the polling place. After the voter marks a paper ballot, their ballot is inserted into the unit for processing. The tabulator uses a high-resolution image-scanning device to simultaneously image the front and back of the ballot. The resulting ballot images are then processed by proprietary mark recognition software, which identifies and evaluates marks made by the voter. The system then tabulates any votes cast on each ballot before depositing the ballot into an integrated secured storage bin. The ballot images and election results are stored on a USB flash drive that can be removed. This USB flash drive may be taken to the municipal clerk's office or other central office where the ballot images and election results may be uploaded into an election results management program or transferred to another memory device or machine to facilitate storage. The DS200 does not store any images or data in its internal memory.

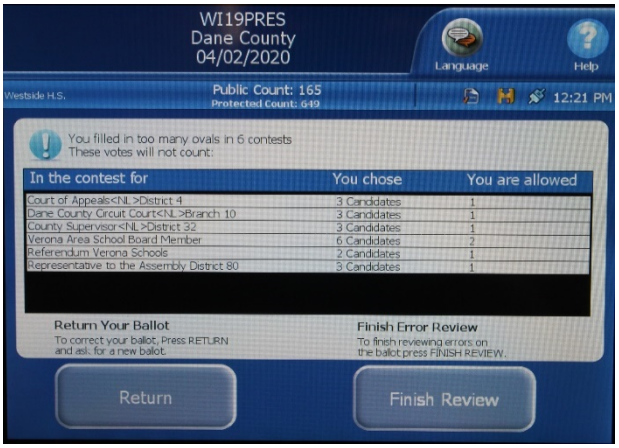
Voter Information Screens: The DS200 features a 12-inch touchscreen display to provide feedback to the voter regarding the disposition of any ballot inserted into the machine. The screens are designed to alert voters to errors on their ballot. The DS200 will, depending on the situation, provide details about the error, identify the specific contests where the errors occurred, allow the ballot to be returned to the voter, and provide the option for the voter to

cast the ballot with errors on it. In two scenarios, the machine will not let the voter cast a ballot and will only return the ballot to the voter. A ballot that has unreadable marks on it will not be accepted by the machine and the DS200 will automatically return ballots if a voter attempts to insert multiple ballots into the machine at the same time.

- **Ballot Counted:** If the ballot is scanned and accepted by the machine, a message appears that states the ballot has been counted.

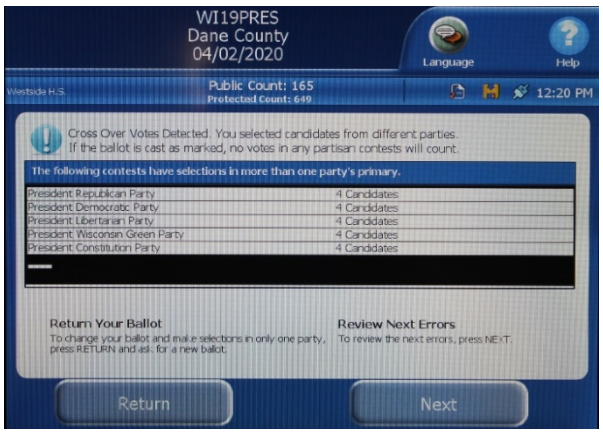


- **Overvote Notification:** If the ballot contains an overvote, a message appears that identifies the contest or contests with overvotes. The message also tells the voter that these votes will not count. The language displayed in this notification reflects the requirements as laid out by the Commission.



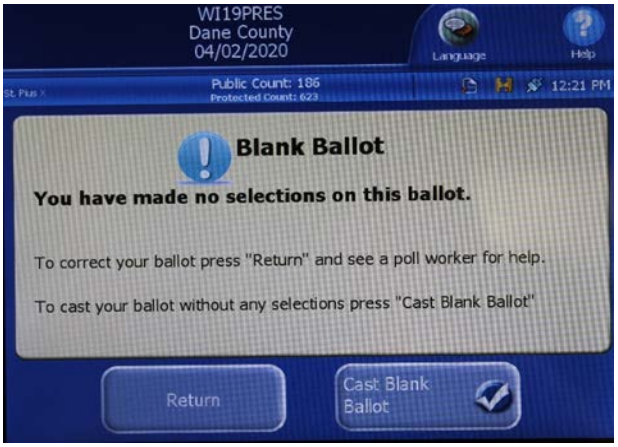
The voter has the option to return the ballot for review or cast the ballot. If there are multiple errors the voter is given an option to review the next error. Instructions above the "Return" button direct the voter to press "Return" if they wish to correct their ballot. The voter is also instructed to ask for a new ballot. Instructions above the "Cast" button direct the voter to press "Cast" if they wish to submit their ballot with votes that will not count. Instructions above the "Next" button direct the voter to press "Next" if they wish to review additional errors on their ballot. Once all the errors have been reviewed, the voter will have the option to cast the ballot.

- **Crossover Vote Notification:** If a ballot is inserted with votes in more than one party's primary, a message appears that identifies the contests with crossover votes. As in the notification for an overvote, the language displayed in this notification reflects the requirements as laid out by the Commission.

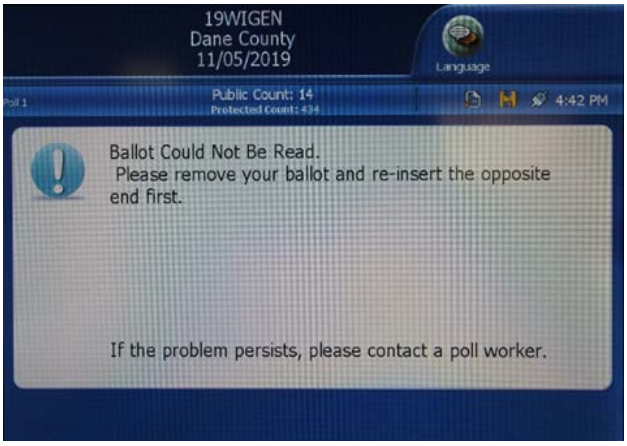


The voter has the ability to return the ballot for review or cast the ballot. If there are multiple errors the voter is given an option to review the next error. Instructions above the "Return" button direct the voter to press "Return" if they wish to correct their ballot to reflect their party preference. The voter is instructed to ask for a new ballot. Instructions above the "Next" button direct the voter to press the "Next" button if they wish to review additional errors on their ballot. Once all errors have been reviewed, the voter will have the option to cast the crossover-voted ballot.

- **Blank Ballot Notification:** If the ballot contains no votes, a message appears that states the ballot is blank. The voter is instructed to press "Return" to correct their ballot and see a poll worker for help. The voter is instructed to press "Cast Blank Ballot" to submit their ballot without any selections.



- **Ballot Could Not Be Read:** If a ballot is inserted incorrectly, the DS200 will return the ballot to the voter and advise that the voter reinsert the ballot into the tabulator. The DS200 does not allow the voter to cast the ballot without resolving the issue and, if the issue persists, the voter is instructed to contact a poll worker for assistance.



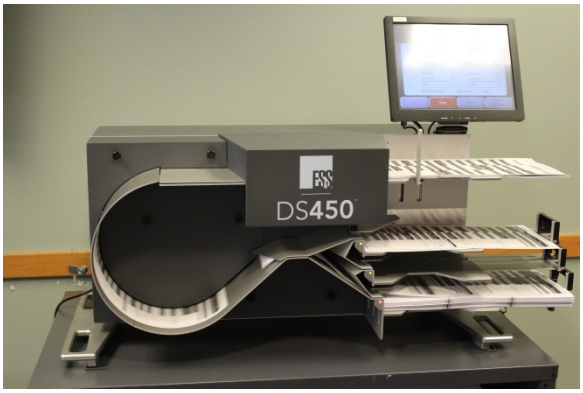
The screen shots above illustrate the manufacturer's default configuration. This system may also be programmed, at the request of the municipality, to automatically reject all ballots with

overvotes or crossover votes without the option for override, which requires the voter to correct the error by remaking his or her ballot. This ensures that voters do not mistakenly process a ballot on which a vote for one candidate or all candidates will not count. The automatic rejection configuration of the DS200, however, creates issues for processing absentee ballots because no voter is present to correct the error. These ballots would have to be remade without the improperly voted contests before they could be processed by the DS200.

Reading Ballots: The DS200 uses proprietary software called Intelligent Mark Recognition to identify properly marked votes on a ballot. Ballots used in conjunction with this system are designed with an oval next to the candidate name or ballot choice that a voter would fill in to indicate their choice. A digital image of both sides of the ballot is captured by the machine when the ballot is inserted and the DS200 scans the ballot images to determine and record the voter's choices. ES&S recommends that voters use a specific marking device (BIC Grip Roller Ball pen) to mark ballots processed on the DS200. Per the supporting documentation provided by ES&S as part of its application, an improper mark is defined as being "smaller than .005 square inches as a marked response on a pixel count basis." Marks that do not have a greater pixel count than this standard will be read by the equipment as an unmarked oval.

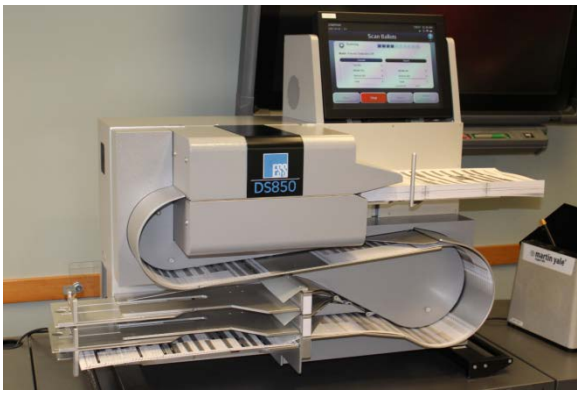
Printing Reports: The DS200 includes an internal thermal printer for the printing of the zero reports, log reports, and polling place totals upon the official closing of the polls.

2. <u>DS450</u>



The DS450 is a mid-range digital scan ballot tabulator designed for use by election officials at a central count facility. This machine can accommodate a variety of different length ballots and can process between 60 and 90 ballots per minute, depending on the size of the ballot. The DS450 uses technology similar to the DS200 to image both sides of the ballot and identify properly marked votes. Three sorting trays are available that can be configured to set apart specific types of ballots for further review. For example, an election official can use the touchscreen interface to program the machine to sort all ballots containing write-in votes or all overvoted ballots into separate trays for hand tabulation or review. While processing ballots, the DS450 prints a continuous audit log to a dedicated audit log printer. Reports are printed from a second printer. The DS450 saves voter selections and ballot images to an internal hard disk and exports results to a USB flash drive for processing with the Election Reporting Manager (ERM).

3. DS850



The DS850 is a high-speed, digital scan ballot tabulator designed for use by election officials at a central count facility. The DS850 can scan and count up to 300 ballots per minute. It uses digital cameras and imaging systems to read the front and back of each ballot, evaluate the result, and sort each ballot into trays based on the result to maintain continuous scanning and tabulating. Multiple criteria can be used to segregate ballots for review, including overvotes, crossover votes and blank ballots. Depending on the situation, ballots segregated in this fashion may not be counted and may need to be remade by the election inspectors. Election officials use a 14-inch touchscreen display to program these features of the DS850. While processing ballots, the DS850 prints a continuous audit log to a dedicated audit log printer. Reports are printed from a second connected printer. The DS850 saves voter selections and ballot images to an internal hard disk and exports results to a USB flash drive for processing with the Election Reporting Manager (ERM).

4. AutoMARK

The AutoMARK is an electronic ballot marking device primarily designed for use by voters who have visual or physical limitations or disabilities.

Voters insert a blank paper ballot in the machine to begin the voting process. They then have the option to use the touchscreen or an integrated tactile keypad to navigate the ballot and make ballot selections. Instructions that guide the voter through the process appear on the screen or can be accessed via the audio ballot function. The voter has the option to adjust the text display contrast and text size to suit their preference. Each button on the tactile keypad has both Braille and printed text labels designed to indicate function and a related shape to help the voter determine its use. In addition, voters may also use headphones to access the audio ballot function that provides a recording of the ballot instructions and lists candidates and options for each contest. The volume and tempo of the audio can be adjusted by the voter and they can use the touchscreen, tactile keypad, or other assistive technology to make their selections.

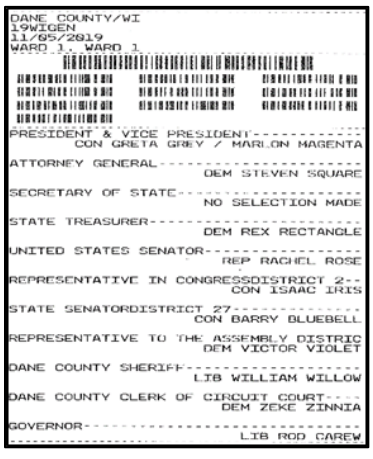
The AutoMARK provides a ballot summary screen for the voter to review their selections before the ballot is marked by the built-in printer. Overvotes and crossover votes cannot occur on this equipment and a voter is warned about undervotes on the ballot summary screen. Once the voter confirms their selections, those selections are marked on ballot and the machine returns the ballot to the voter.

After the voter completes the process, the AutoMARK clears its internal memory and the paper ballot is the only record of the voting selections made. Ballots marked using the AutoMARK can be processed by the DS200 or deposited into a secured ballot box to be hand tabulated by election inspectors after the polls have closed. Ballots marked using the AutoMARK also may be tabulated using the DS450 and DS850.

5. ExpressVote

The ExpressVote is an electronic vote capture device designed for use by all voters. It features a touchscreen display and integrated thermal printer.

Voters insert a blank ballot card in the machine to begin the voting process. Ballot instructions, contests and candidates are displayed on the screen and they have the option to use the touchscreen or the keypad to navigate the ballot and make selections. The voter may adjust the text contrast and size of the display, if needed. Each button on the tactile keypad has both Braille and printed text labels designed to indicate function and use to the voter. In addition, voters may also use headphones to access the audio ballot function that provides a recording of the ballot instructions and lists candidates and options for each contest. The volume and tempo of the audio can be adjusted by the voter and they can use the touchscreen, tactile keypad, or other assistive technology to make their selections.

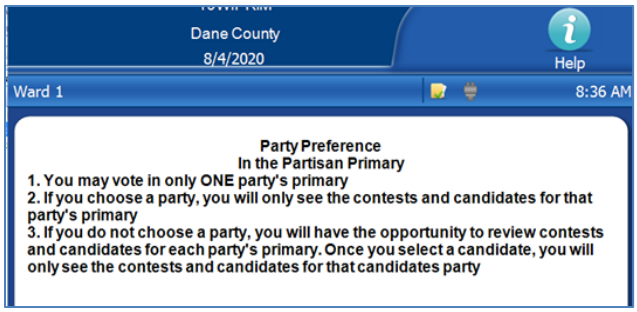

DANE COUNTY/WI
19WIGEN
11/05/2019
WARD 1, WARD 1

PRESIDENT & VICE PRESIDENT----------
CON GRETA GREY / MARLON MAGENTA
ATTORNEY GENERAL----------
DEM STEVEN SQUARE
SECRETARY OF STATE----------
NO SELECTION MADE
STATE TREASURER----------
DEM REX RECTANGLE
UNITED STATES SENATOR----------
REP RACHEL ROSE
REPRESENTATIVE IN CONGRESSDISTRICT 2--
CON ISAAC IRIS
STATE SENATORDISTRICT 27----------
CON BARRY BLUEBELL
REPRESENTATIVE TO THE ASSEMBLY DISTRIC
DEM VICTOR VIOLET
DANE COUNTY SHERIFF----------
LIB WILLIAM WILLOW
DANE COUNTY CLERK OF CIRCUIT COURT----
DEM ZEKE ZINNIA
GOVERNOR----------
LIB ROD CAREW

The ExpressVote provides a ballot summary screen for the voter to review their selections before the ballot is marked by the built-in printer. Overvotes and crossover votes cannot occur on this equipment and a voter is warned about undervotes on the ballot summary screen. Once the voter confirms their selections, those selections are printed on ballot and the machine returns the ballot to the voter. The ExpressVote ballot cards do not employ the oval format but utilize an unambiguous ballot format where the names of candidates and referendum choices are printed directly on the ballot card along with the names of the contest. The phrase "No Selection" appears under any contest in which the elector did not vote.

After the voter completes the process, the ExpressVote clears its internal memory and the paper ballot is the only record of the voting selections made. Ballot cards marked using the ExpressVote can be processed by the DS200 or deposited into a secured ballot box to be hand tabulated by election inspectors after the polls have closed. Ballot cards marked using the ExpressVote may also be tabulated using the DS450 and DS850.

For Partisan Primary elections, the ExpressVote displays language similar to the verbiage on the DS200. This language further clarifies the unique instructions for voting in such an election and reflects previous Commission recommendations.



6. ExpressLink

ExpressLink is an application software used to pre-print ballot cards for the ExpressVote so that ballot style information is automatically loaded when the ballot card is put into the ExpressVote. Ballot style information, in the form of a barcode for Ward 1 ballots and a different code for Ward 2 ballots, are printed at the top of the blank ExpressVote ballot card using an ExpressLink associated printer. If blank ballot cards are used in these situations, a poll worker or voter will be prompted to select the correct ballot style upon inserting the activation card. WEC staff pre-printed activation cards for this test campaign using this application and the ExpressLink printer. WEC staff incorporated these preprinted activation cards into the in-office equipment testing by including 100 ballot cards in 10 reporting units as part of the ExpressVote ballot test deck. A more detailed explanation of the ExpressLink testing on page 16 of this report.

As in previous testing campaigns, this feature worked as designed. However, neither the ExpressLink application nor ExpressLink printer are federally certified by the EAC. NTS, a Voting System Test Laboratory, determined it to be outside of the scope of certification but NTS did review the source code for 2005 VVSG compliance. NTS tested the equipment and found that it functions as stated in the technical data package for this voting system. No other federal testing was performed on this equipment. ES&S states that these products do not require federal certification. These products are described as ancillary products available to a jurisdiction who may purchase the system. These products are not required for the ExpressVote to function and, in their absence, election inspectors will need to activate each ballot on the ExpressVote if more than one ballot style is available on the machine.

ii. Software

EVS 5.2.4.0 offers an update to the ElectionWare software suite previously approved for use in Wisconsin under EVS 5.2.0.0. ElectionWare integrates election administration functions into a

unified application and is used to create the programming definitions for an election and to create the files used by the DS200, DS850, ExpressVote, AutoMARK, and ERM.

The software components used during this test campaign were as follows:

Software	***Version***
ElectionWare	4.7.1.4
Election Reporting Manager (ERM)	8.12.1.1
ES&S Event Logging Service (ELS)	1.5.5.0
ExpressVote Previewer	1.4.1.7
ExpressLink*	1.3.0.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.1

WEC staff visually verified the software version numbers for each component of the EVS 5.2.4.0 by checking the component's configuration display.

In addition to the verification of software version numbers, WEC staff also had the opportunity to interact with several functionalities of the software components of EVS 5.2.4.0. The functionality of the three tabulators that capture digital ballot images increases the ability of groups requesting to conduct post-election audits of the vote. The images could be provided or made publicly available via a county or municipal website, in lieu of copies of paper ballots.

These ballot images can be exported to the Election Management System and a report listing the disposition of each vote on a ballot can be viewed. This feature can be used to verify how a tabulator treated a vote or ballot if questions arise as to how the machine counted votes for a contest or on a specific ballot, or ballots. The ballot image files serve as a reliable backup in the event that original ballot images are lost or damaged.

B. <u>EVS 5.3.4.0 (base voting system with modeming functionality)</u>

EVS 5.3.4.0 is a modification to EVS 5.2.4.0 that provides support for modeming of unofficial election results from a DS200 to a Secure File Transfer Protocol (SFTP) server through public analog or wireless telecommunications networks. All modifications of the system were tested to the 2005 VVSG by NTS.

At its May 21, 2013, meeting, pursuant to authority granted in Wis. Stat. § 5.91 and Wis. Admin. Code EL 7, the Government Accountability Board adopted testing procedures and standards pertaining to the modeming and communication functionality of voting systems that have not received EAC certification. The standards were based upon the analysis and findings outlined in a staff memorandum and detailed in the *Voting Systems Standards, Testing Protocols and*

Procedures Pertaining to the Use of Communication Devices in Wisconsin, which are attached as Appendix D. These rules apply to non-EAC certified voting systems, where the underlying voting system received EAC certification to either the 2002 Voting System Standards (VSS) or 2005 VVSG, but any additional modeming component does not meet the 2005 VVSG.

WEC staff conducted testing of EVS 5.3.4.0 in three counties: Brown, Rock, and Marathon between April 15 and April 18, 2019. In consultation with each county clerk, WEC staff selected three municipalities in each county to serve as locations for testing.[1] The municipalities were selected in part because of the strength of the wireless networks in the community, or lack thereof, and the municipal clerk's willingness to host the test team.

The modem in the DS200 communicates with the jurisdiction's wireless carrier or a dial-up connection through a landline modem to transmit unofficial election night results to a secure server at a central office location, such as the county clerk's office. Wireless transmissions rely on public networks from one of these three cellular service providers: AT&T, Sprint, or Verizon. The server hosts a secure file transfer commercial off the shelf software package. A firewall provides a buffer between the network segment, where the server is located, and other internal virtual networks or external networks. The data that is transmitted is encrypted and it is digitally signed. The modem function may only be used after an election inspector has closed the polls and entered a password to access the control panel. The network is configured to only allow valid connections to connect to the SFTP server. The firewall further restricts the flow and connectivity of traffic.

The EMS is required to be deployed on a "hardened system," meaning that all software that is not essential to the proper functioning of the EMS should be removed from the computer where the EMS is installed. This procedure is designed to increase the security of the system through the elimination of applications that may provide "back door" access to the system. Access to the internet should also be restricted and the EMS provides an audit log of all system actions and connection attempts that can be used to verify unauthorized access to the system while unofficial election results are being transmitted after the close of polls.

The decision on whether the DS200 will include an analog or wireless modem is made at the time of purchase. The EMS supports modeming from a combination of methods in a jurisdiction. For example, a jurisdiction could have two sites with analog modems and three sites with wireless modems. This voting system successfully handled simultaneous transmissions from both types of modems. Conversely, a jurisdiction could choose to purchase all analog modems or all wireless modems and these configurations were also successfully tested during this campaign. Some of the factors that may impact this decision include the strength of wireless service in the jurisdiction and whether the jurisdiction has an existing contract with one of the three service providers. The EMS supports modeming through a combination of service providers. During this test campaign, WEC staff successfully transmitted results in each county

[1] Brown County: Village of Ashwaubenon, Village of Suamico, Town of Lawrence
Rock County: City of Janesville, Town of Harmony, Town of Fulton
Marathon County: Village of Marathon City, Village of Maine, Village of Rothschild

using AT&T in one municipality, Sprint in another municipality, and Verizon in a third municipality. During this test campaign, the strength of service ranged from two bars (lowest indicator level is zero) to five bars (highest indicator level). Election results packets were sent successfully at all service levels.

EVS 5.3.4.0 also features a Regional Results program. This stand-alone application allows for the transmission of unofficial election results from a regional location to a central office utilizing a wireless network provided by AT&T, Sprint, or Verizon. WEC staff observed this process in Marathon County. The Regional Results application allows election media containing results from different polling places to be read and then securely transferred to a server at a central office location such as the county clerk's office.

Neither the modem function of the DS200 nor the Regional Results program impacts the tabulation of official election results.

i. Hardware

ES&S submitted the following equipment for testing as part of EVS 5.3.4.0:

Equipment	***Hardware Version(s)***	***Firmware Version***	***Type***
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DS450	1.0	3.0.0.0	Mid-range Central Count Digital Scanner and Tabulator
DS850	1.0	2.10.2.0	Central Count Digital Scanner and Tabulator
AutoMark Voter Assist Terminal (VAT)	1.0 1.1 1.3	1.8.6.1	Ballot Marking Device
ExpressVote	1.0	1.4.1.7	Universal Vote Capture Device

iii. Software

The software components used during this test campaign were as follows:

Software	***Version***
ElectionWare	4.7.1.4
Election Reporting Manager (ERM)	8.12.1.2

ES&S Event Logging Service (ELS)	1.5.5.0
ExpressVote Previewer	1.4.1.7
ExpressLink	1.3.0.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.1
Regional Results	1.1.0.0

IV. Functional Testing

A. EVS 5.2.4.0 (base voting system)

As required by Wis. Admin. Code EL § 7.02(1), WEC staff conducted three mock elections with each component of EVS 5.2.4.0 to ensure the voting system conforms to all Wisconsin requirements: a partisan primary, a general election with both a presidential and special gubernatorial contest, and a presidential preference vote combined with a nonpartisan election.

WEC staff designed a test deck of nearly 1,400 ballots using various configurations of votes over the three mock elections to verify the accuracy and functional capabilities of the EVS 5.2.4.0. Using blank test ballots supplied by ES&S, WEC staff appropriately marked votes for contests and candidates as designated on the test deck spreadsheet. For each mock election, 300 paper ballots were marked to be fed through the DS200, DS450 and DS850. An additional 80 paper ballots were marked to test the write-in report function of the DS200. The functionality of the ExpressVote was tested by marking 250 ballots with the equipment across the three mock elections. This total includes 50 ballots for each mock election, plus 100 ExpressVote ballots that were marked as part of ExpressLink testing. A total of 150 ballots were marked on the AutoMARK, 50 ballots for each mock election.

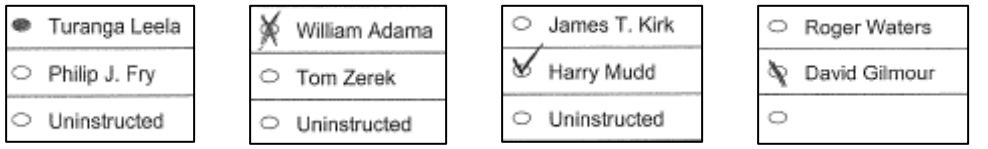
The ballots marked, as well as the votes captured by the ExpressVote, and ballots marked with the AutoMARK were verified by WEC staff before being scanned and counted by the DS200, DS450, and DS850. WEC staff ensured that the results produced by the three pieces of equipment were accurate and reconciled with the test deck script prior to transitioning to test the next mock election type. A small number of results anomalies were investigated and resolved in real time, with a slight delay to testing.

Votes were recorded on test ballots in a variety of configurations in all contests to ensure that the programming of the tabulation equipment was compatible with Wisconsin election law, and that the equipment processed ballot markings in accordance with statutory requirements. Ballots were purposefully marked with overvoted contests and the equipment was able to consistently identify those scenarios and inform the voter about the specific contest, or contests, that were problematic. Ballots for both the Partisan Primary and Presidential Preference mock elections were also marked with votes that crossed party lines and, in each instance, the machines were able to identify those crossover votes and display the warning screen to the voter. Two different

ballot styles were used for each mock election and one ballot style in each election had a special election contest included on the ballot. This inclusion was used to determine if the equipment could be programmed to accommodate multiple election definitions on the same ballot style and produce accurate results. In all instances, the equipment was found to have accurately tabulated votes and correctly reflected Wisconsin election law in the programming.

The test decks used for this campaign were also designed to determine what constitutes a readable mark by each piece of tabulation equipment included in this system. A subset of ballots in the test deck were marked using "special marks." The ballots with special marks were processed by the tabulation equipment. WEC staff reviewed the results to determine which of the special marks were read by the machines. The chart below illustrates actual marks from test deck ballots that were successfully read and counted as "good marks" by the DS200, DS450 and DS850.

Examples of Marks Read by the EVS 5.2.4.0 Components during Testing

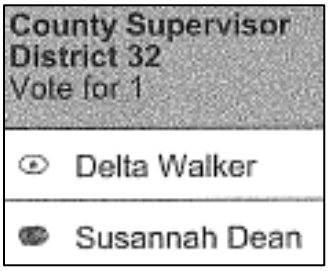


All three pieces of equipment were able to correctly read marks in pencil, black pen, blue pen, red pen, and green pen as well as using markers provided by ES&S. The test decks also included ballots folded to simulate absentee ballots and ballots with slight tears in them. Folded ballots were able to be processed on the DS200, DS450 and DS850. It is possible for ballots with folds directly through the oval to create what is best described as a false positive. While all three pieces of equipment processed slightly torn ballots without incident, anything other than a slight tear was only able to be processed by the DS200. Ballots with large tears resulted in jams in both the DS450 and the DS850. Staff would advise that ballots with folds or tears be remade before being tabulated on Election Day.

Blank ballots were also included to determine how each of the three different tabulators would treat these ballots. The DS200 was able to identify blank ballots and provide a warning message to the voter that indicated the ballot was blank and provide options to return the ballot or cast it as is. This functionality was also tested on the DS450 or DS850, with the blank ballots diverted to a separate tray for election inspector review.

Ballots with write-in votes tabulated by the DS200 are marked by the tabulator with a small pink circle on one end of the ballot. Depending on the ballot box used, these ballots may or may not be diverted into a separate write-in bin. This voting system can also be configured to capture ballot images of ballots with write-ins and store them on the external USB flash drive, which would permit write-in votes to be easily verified within the ElectionWare EMS. For a more detailed review of the testing staff conducted to review the DS200's write-in report functionality, please see Appendix F.

The majority of ballots in the test deck were processed without incident during the test campaign, but there were anomalies and inconsistencies identified. One inconsistency was that ballots marked in pencil with erasure marks were not read the same by each of the three machines. In multiple instances, a ballot with an erasure mark that was not counted by one piece of equipment was treated as a "good mark" by a different piece of equipment in the system. Other test ballots that contained lighter erasure marks were treated uniformly by all three tabulators.



In addition, ballots that were purposefully marked with slight resting marks were also not treated consistently across all three machines. As shown in the example to the right, on ballots where there were heavy, or especially dark resting marks, the DS850, in several instances, did not read the resting mark in the oval as a vote and counted the ballot. However, the DS450 and DS200 both read the mark as unclear, or an overvote, and would not accept the ballot as marked. Additional test ballots that were marked with lighter resting marks within an oval, or with resting marks touching the edge or outside of the oval were all treated the same by the three machines and these marks did not negatively impact the counting of votes on those ballots.

Anomalies such as these are common during a testing campaign and are identified by the purposeful inclusion of ambiguous marks on test deck ballots. In both instances, voter behavior in marking the ballot (dark erasure smudge and resting mark within an oval) played a significant role in the disposition of those ballots by the voting equipment. Testing results and staff observation of the system indicate that EVS 5.2.4.0 consistently identifies and tabulates correctly marked votes in a uniform fashion. The system is also flexible enough to correctly interpret special marks made within an oval while not considering resting or stray marks made outside of an oval.

Staff also conducted testing on the ExpressLink application and ballot style printer. The ExpressLink printer places a barcode on an ExpressVote ballot that, when inserted, automatically loads a voter's correct ballot style. To ensure that the ExpressLink printer functions appropriately, staff placed ballot style activation codes on 100 ExpressVote ballot cards, representing 10 ballot styles. These 100 ballot cards were then placed in the ExpressVote and marked according to a pre-set test script. Each of the 100 ExpressVote ballot cards that had been pre-printed with the ExpressLink ballot style activation codes loaded the corresponding ballot style correctly. Further detail on the testing protocol employed to test the ExpressLink functionality can be found in Appendix E.

B. <u>EVS 5.3.4.0 (base voting system with modeming functionality)</u>

WEC staff conducted functional testing of EVS 5.3.4.0 in Brown, Rock, and Marathon counties based on the *Voting Systems Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices in Wisconsin.* A four-person team of WEC staff conducted this testing campaign. Two representatives from ES&S were on hand in each county to provide technical support. ES&S provided three (3) DS200s in each county, equipped with the

appropriate style of modem to be tested. Also provided by ES&S as part of testing was a portable EMS environment, which included an SFTP client, firewall, and ERM software. In each location, ES&S set up the portable environment in the county office to receive test election results from each municipal testing location. In each municipal location, WEC staff inserted a pre-marked package of 10 test ballots through the DS200 to create an election results packet to transmit to the county office. A WEC staff member was present at the county office to observe how the portable EMS environment handled the transmissions.

In previous test campaigns, staff tested both wireless and analog (wired) modems in each of the three counties. Testing for EVS 5.3.4.0, however, necessitated a deviation from that established practice. Through contacting various county clerks who had expressed interest in participating in the equipment testing process, staff learned that the traditional analog telephone line in many county office buildings have either been digitized or transferred to Voice Over IP (VOIP) connections. Analog phone lines are a crucial part of testing transmission in modems with a wired connection as results cannot be correctly received by the county when the inbound connection is different than that from which it was sent. Lacking an analog connection in both Rock and Marathon counties, analog modem testing was conducted only in Brown County. To ensure that multiple machines with an analog connection were tested, and to mimic Brown County's actual election night transmission procedure, staff tested DS200s with a wired connection in each of the three municipalities.

Moving forward with future test campaigns, a lack of analog phone lines in county buildings will become more common. To overcome this, staff will work with ES&S representatives during the planning phase of the test campaign to determine the modem connection type of each county where testing could take place. Based on their customer list, ES&S can pull data based on current equipment and modem type and then provide WEC staff with that information. Staff will then contact county clerks and inquire of their willingness and ability to accommodate a voting equipment test campaign.

i. Brown County

On April 16, 2019, WEC staff conducted tests on the EVS 5.3.4.0 modem component in three municipalities: Village of Suamico, Village of Ashwaubenon, and Town of Lawrence. ES&S conducted pre-testing of the EVS 5.3.4.0 analog modem component in Brown County prior to testing. A DS200 equipped with an analog modem was tested in all three municipalities. A test script was used to ensure that each machine conforms to the communications device standards and was able to transmit accurate election results data from the DS200 to the Election Reporting Manager.

Municipality	Type of Modem	Signal Strength
Village of Suamico	Analog	n/a
Village of Ashwaubenon	Analog	n/a
Town of Lawrence	Analog	n/a

WEC staff successfully transmitted election results from each of the three municipalities using analog modems. The test script calls for the verification of several certification standards and then requires 10 results sets to be transmitted from each DS200. The machines were able to successfully transmit multiple results with a 90% success rate during this portion of testing. The functional testing concluded with a stress test where WEC staff attempted to transmit results simultaneously from all the machines for a set period of time and each machine was able to transmit multiple results sets during that 15-minute timeframe. Staff experienced two different situations when transmission attempts failed. First, the DS200 displayed a "server error" message on several occasions that indicates a failure to establish the necessary connection between the modem and the ERM server. The second scenario occurred when staff received a message that the line was 'busy' and could not accept transmissions at that time. This scenario occurred during the stress test when multiple machines were attempting to transmit results during a controlled time period.

Location	Modem Type	Initial Transmission	Load Test Results
Village of Suamico	Analog	9 of 10	7 of 8
Town of Lawrence	Analog	10 of 10	2 of 5
Village of Ashwaubenon	Analog	9 of 10	3 of 6
Totals		**24 of 30**	**12 of 19**

ii. Rock County

On April 17, 2019, WEC staff conducted tests on the EVS 5.3.4.0 modem component in three municipalities: Town of Fulton, City of Janesville, and Town of Harmony. ES&S conducted pre-testing of the EVS 5.3.4.0 modem component in Rock County prior to testing. A DS200 equipped with a wireless modem was tested in all three municipalities. The same test script that was used in Brown County was again used during this portion of the test campaign.

Municipality	Type of Modem	Signal Strength
Town of Fulton	Wireless – AT&T	2-3 bars
Town of Harmony	Wireless – Sprint	3 bars
City of Janesville	Wireless – Sprint	4 bars

WEC staff successfully transmitted election results from each of the three municipalities using wireless modems. The test script calls for the verification of several certification standards and then requires 10 results sets to be transmitted from the DS200. The three machines each were able to successfully transmit all 10 results sets during this portion of testing. The functional testing concluded with a stress test where WEC staff attempted to transmit results simultaneously from all the machines for a set period of time and each machine was able to transmit at least 12 results set during the stress test with zero overall transmission failures.

Location	Modem Type	Initial Transmission	Load Test Results
Town of Fulton	Wireless – AT&T	10 of 10	12 of 12
Town of Harmony	Wireless - Sprint	10 of 10	14 of 14
City of Janesville	Wireless – Sprint	10 of 10	14 of 14
Totals		**30 of 30**	**40 of 40**

iii. Marathon County

On April 18, 2019, WEC staff conducted tests on the EVS 5.3.4.0 modem component in three municipalities: Village of Marathon City, Village of Maine, and Village of Rothschild. ES&S conducted pre-testing of the EVS 5.3.4.0 modem component in Marathon County prior to WEC testing. A DS200 equipped with a wireless modem was tested in all three municipalities. The same test script that was used in Brown and Rock Counties was again used during this portion of the test campaign.

Municipality	Type of Modem	Signal Strength
Village of Marathon City	Wireless – AT&T	3 bars
Village of Maine	Wireless – Sprint	3 bars
Village of Rothschild	Wireless – AT&T	4 bars

WEC staff successfully transmitted election results from each of the three municipalities using wireless modems. The test script calls for the verification of several certification standards and then requires 10 results sets to be transmitted from the DS200. The three machines each were able to successfully transmit all 10 results sets during this portion of testing. The functional testing concluded with a stress test where WEC staff attempted to transmit results simultaneously from all of the machines for a set period of time and each machine was able to transmit at least 12 results set during the stress test with zero overall transmission failures.

Location	Modem Type	Initial Transmission	Load Test Results
Village of Marathon City	Wireless – AT&T	10 of 10	12 of 12
Village of Maine	Wireless - Sprint	10 of 10	10 of 10
Village of Rothschild	Wireless – AT&T	10 of 10	15 of 15
Totals		**30 of 30**	**37 of 37**

Other testing notes:

- WEC staff experienced no issues with the wireless modem component. However, questions remain over the efficacy of the wired modem component because of the decreasing availability of analog phone lines. WEC staff would recommend any purchasing entity considering the wired modem option consult their municipal and county IT departments to ensure that a traditional analog signal can be received by the ERM in the current county building setup. These conversations should also give the

clerk information on possible future digitization or VOIP transition away from standard phone lines.

- The success rate of modem transmission attempts is largely dependent on the presence of reliable infrastructure. Staff is confident that the modeming functionality of EVS 5.3.4.0 performs as described by the vendor in the application materials. It is recommended that purchasing jurisdictions assess their current infrastructure to determine compatibility with EVS 5.3.4.0 and identify any necessary upgrades that may impact their purchasing and implementation budget.

V. Public Demonstration

A public demonstration of the EVS 5.2.4.0 was held April 10, 2019, from 4:00 p.m. to 5:30 p.m. in Madison at the WEC office. The public meeting is designed to allow members of the public the opportunity to use the voting system and provide comment. There was one attendee at the public demonstration.

VI. Wisconsin Elections Commission Voting Equipment Review Panel Meeting

In an effort to continue to receive valuable feedback from local election officials and community advocates during the voting equipment approval process, the Wisconsin Elections Commission formed a Voting Equipment Review Panel. Wis. Admin. Code EL §7.02(2), permits the agency to use a panel of local election officials and electors to assist in the review of voting systems.

Five of the 25 invited participants attended the Voting Equipment Review Panel Meeting, which is composed of municipal and county clerks, representatives of the disability community, and advocates for the interests of the voting public. Several members who had submitted an rsvp could not attend due to a spring snowstorm. The meeting took place at the WEC office in Madison on April 10, 2019, from 2:00 p.m. to 3:30 p.m. ES&S provided a demonstration of the EVS 5.2.4.0 with attendees encouraged to test the equipment. The modeming component of the EVS 5.3.4.0 was discussed but not demonstrated during the meeting. Comments and feedback from the Voting Equipment Review Panel meeting are included in Appendix G.

VII. Statutory Compliance

Wis. Stat. §5.91 provides the following requirements voting systems must meet to be approved for use in Wisconsin. Please see the below text of each requirement and staff's analysis of the EVS 5.2.4.0 and EVS 5.3.4.0's compliance with the standards.

§ 5.91 (1)
The voting system enables an elector to vote in secret.
Staff Analysis
The ES&S voting systems meet this requirement by allowing a voter to vote a paper ballot in the privacy of a voting booth or at the accessible voting station without assistance.

§ 5.91 (3)
The voting system enables the elector, for all elections, except primary elections, to vote for a ticket selected in part from the nominees of one party, and in part from nominees from other parties and write-in candidates
Staff Analysis
The ES&S voting systems allow voter to split their ballot among as many parties as they wish during any election that is not a partisan primary.

§ 5.91 (4)
The voting system enables an elector to vote for a ticket of his or her own selection for any person for any office for whom he or she may desire to vote whenever write-in votes are permitted.
Staff Analysis
The ES&S voting systems allow write-ins where permitted.

§ 5.91 (5)
The voting systems accommodate all referenda to be submitted to electors in the form provided by law.
Staff Analysis
The ES&S voting systems meet this requirement.

§ 5.91 (6)
The voting system permits an elector in a primary election to vote for the candidates of the recognized political party of his or her choice, and the system rejects any ballot on which votes are cast in the primary of more than one recognized political party, except where a party designation is made or where an elector casts write-in votes for candidates of more than one party on a ballot that is distributed to the elector.
Staff Analysis
The ES&S voting systems can be configured to always reject crossover votes without providing an opportunity for the voter to override. The system can also be programmed to provide a warning screen to the voter that identifies

any crossover voted contest. Either one of these programming options allows these systems to meet this requirement. The warning screen provides options where the voter can choose to have their ballot returned to them or they can cast the ballot without correcting the crossover vote. The use of the override function was previously prohibited by statute, but Wis. Stats. §5.85(2)(b) expressly allows for the optional use of the override function in event of an overvote and the WEC has applied the same standard to the use of the override function in the event of crossover vote.

§ 5.91 (7)
The voting system enables the elector to vote at an election for all persons and offices for whom and for which the elector is lawfully entitled to vote; to vote for as many persons for an office as the elector is entitled to vote for; to vote for or against any question upon which the elector is entitled to vote; and it rejects all choices recorded on a ballot for an office or a measure if the number of choices exceeds the number which an elector is entitled to vote for on such office or on such measure, except where an elector casts excess write-in votes upon a ballot that is distributed to the elector.
Staff Analysis
The ES&S voting systems can be configured to always reject overvotes without providing an opportunity for the voter to override. The system can also be programmed to provide a warning screen to the voter that identifies any overvoted contest. Either one of these programming options allows these systems to meet this requirement. The warning screen provides options where the voter can choose to have their ballot returned to them or they can cast the ballot without correcting the overvote. The use of the override function was previously prohibited by statute, but Wis. Stats. §5.85(2)(b) expressly allows for the optional use of the override function in event of an overvote.

§ 5.91 (8)
The voting system permits an elector at a General Election by one action to vote for the candidates of a party for President and Vice President or for Governor and Lieutenant Governor.
Staff Analysis
The ES&S voting systems meet this requirement.

§ 5.91 (9)
The voting system prevents an elector from voting for the same person more than once, except for excess write-in votes upon a ballot that is distributed to the elector.
Staff Analysis

The ES&S voting systems meet this requirement.

§ 5.91 (10)
The voting system is suitably designed for the purpose used, of durable construction, and is usable safely, securely, efficiently and accurately in the conduct of elections and counting of ballots.
Staff Analysis
The ES&S voting systems meet this requirement.

§ 5.91 (11)
The voting system records and counts accurately every vote and maintains a cumulative tally of the total votes cast that is retrievable in the event of a power outage, evacuation or malfunction so that the records of votes cast prior to the time that the problem occurs is preserved.
Staff Analysis
The ES&S voting systems meet this requirement.

§ 5.91 (12)
The voting system minimizes the possibility of disenfranchisement of electors as the result of failure to understand the method of operation or utilization or malfunction of the ballot, voting system, or other related equipment or materials.
Staff Analysis
The ES&S voting systems can be programmed to provide warning screens to the voter that identifies any problem with their ballot. The warning screens provide an explanation of the problem and allow the voter to have their ballot returned to them to review and correct the error. The systems can be configured to always reject overvotes and crossover votes without providing an opportunity for the voter to override.

§ 5.91 (13)
The automatic tabulating equipment authorized for use in connection with the system includes a mechanism which makes the operator aware of whether the equipment is malfunctioning in such a way that an inaccurate tabulation of the votes could be obtained.
Staff Analysis
The ES&S voting systems meet this requirement.

§ 5.91 (14)
The voting system does not use any mechanism by which a ballot is punched or punctured to record the votes cast by an elector.

Staff Analysis
The ES&S voting systems do not use any such mechanism to record votes.

§ 5.91 (15)
The voting system permits an elector to privately verify the votes selected by the elector before casting his or her ballot.
Staff Analysis
The ES&S voting systems meet this requirement through the use of hand-marked paper ballots and accessible voting equipment that provides both an electronic ballot review screen and a marked paper ballot that can be reviewed before tabulation.

§ 5.91 (16)
The voting system provides an elector the opportunity to change his or her votes and to correct any error or to obtain a replacement for a spoiled ballot prior to casting his or her ballot.
Staff Analysis
The ES&S voting systems meet this requirement.

§ 5.91 (17)
Unless the ballot is counted at a central counting location, the voting system includes a mechanism for notifying an elector who attempts to cast an excess number of votes for a single office the ballot will not be counted, and provides the elector with an opportunity to correct his or her ballot or to receive a replacement ballot.
Staff Analysis
The ES&S voting systems can be programmed to provide warning screens to the voter that identifies any problem with their ballot. The warning screens provide an explanation of the problem and allow the voter to have their ballot returned to them to review and correct the error. The systems can be configured to always reject overvotes and crossover votes without providing an opportunity for the voter to override.

§ 5.91 (18)
If the voting system consists of an electronic voting machine, the voting system generates a complete, permanent paper record showing all votes cast by the elector, that is verifiable by the elector, by either visual or nonvisual means as appropriate, before the elector leaves the voting area, and that enables a manual count or recount of each vote cast by the elector.
Staff Analysis

Since the ES&S voting systems presented for approval require paper ballots to be used to cast votes, this requirement does not apply.

The Help America Vote Act of 2002 (HAVA) also provides the following applicable requirements that voting systems must meet:

HAVA § 301(a)(1)(A)
The voting system shall: (i) permit the voter to verify (in a private an independent manner) the votes selected by the voter on the ballot before the ballot is cast and counted; (ii) provide the voter with the opportunity (in a private and independent manner) to change the ballot or correct any error before the ballot is cast and counted (including the opportunity to correct the error through the issuance of a replacement ballot if the voter was otherwise unable to change the ballot or correct any error); and (iii) if the voter selects votes for more than one candidate for a single office – (I) notify the voter than the voter has selected more than one candidate for a single office on the ballot; (II) notify the voter before the ballot is cast and counted of the effect of casting multiple votes for the office; and, (III) provide the voter with the opportunity to correct the ballot before the ballot is cast and counted
HAVA § 301(a)(1)(C)
The voting system shall ensure than any notification required under this paragraph preserves the privacy of the voter and the confidentiality of the ballot.
HAVA § 301(a)(3)(A)
The voting system shall— (A) be accessible for individuals with disabilities, including nonvisual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as other voters
Staff Analysis
The ES&S voting systems meet these requirements through the inclusion of multiple options for ADA-compliant voting machines municipalities can choose to employ. Each of these accessible voting options was testing for functionality and usability during this test campaign.

VIII. Recommendations

Staff has reviewed the application materials, including the technical data package and testing lab report, and examined the results from the functional and modeming test campaigns to determine if these systems are compliant with both state and federal certification laws. EVS 5.2.4.0 complies with all applicable state and federal requirements. As EVS 5.2.4.0 is the base voting system for EVS 5.3.4.0, EVS 5.3.4.0 also meets this standard. The voting systems met all standards over three mock elections and staff determined they can successfully run a transparent, fair, and secure election in compliance with Wisconsin Statutes. The systems also enhance access to the electoral process for individuals with disabilities with the inclusion of the ExpressVote vote capture system and the AutoMARK ballot-marking device.

1. WEC staff recommends approval of ES&S voting system EVS 5.2.4.0 and components set forth in the tables on pages 3 and 10 above. This voting system accurately completed the three mock elections and was able to accommodate the voting requirements of the Wisconsin election process. Additionally, WEC staff recommends approval of ES&S voting system EVS 5.3.4.0 and components set forth in the tables on pages 12 and 13 above. This recommendation is based on the VSTL report provided by Pro V&V and on this voting system successfully completing a functional test according to the *Voting Systems Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices in Wisconsin*.

2. WEC staff recommends approval of the ExpressLink application software and ballot style printer as part of the WEC's approval. While this product lacks EAC certification, the component performed successfully when evaluated under a Commission approved test protocol.

3. WEC staff recommends that as a continuing condition of the WEC's approval, ES&S may not impose customer deadlines contrary to requirements provided in Wisconsin Statutes, as determined by the WEC. In order to enforce this provision, local jurisdictions purchasing ES&S equipment shall also include such a provision in their respective purchase contract or amend their contract if such a provision does not currently exist.

4. WEC staff recommends that as a continuing condition of the WEC's approval, that this system must always be configured to include the following options:

    a. Automatic rejection of crossover and overvoted ballots with or without the option to override.
    b. Automatic rejection of all improper ballots except blank ballots.
    c. Digital ballot images to be captured for all ballots tabulated by the system.

5. As part of US EAC certificate: ESSEVS5240, only equipment included in this certificate can be used together to conduct an election in Wisconsin. Previous versions that were approved for use by the former Elections Board and the G.A.B. are not compatible with the new ES&S

voting system and are not to be used together with the equipment seeking approval by the WEC, as this would void the US EAC certificate. If a jurisdiction upgrades to EVS 5.2.4.0, it needs to upgrade each and every component of the voting system to the requirements of what is approved herein. Likewise, if a jurisdiction upgrades to EVS 5.3.4.0, it needs to upgrade each and every component of the voting system to the requirements of what is approved herein.

6. WEC staff recommends that as a condition of approval, ES&S shall abide by applicable Wisconsin public records laws. If, pursuant to a proper public records request, the customer receives a request for matters that might be proprietary or confidential, customer will notify ES&S, providing the same with the opportunity to either provide customer with the record that is requested for release to the requestor, or shall advise customer that ES&S objects to the release of the information, and provide the legal and factual basis of the objection. If for any reason, the customer concludes that customer is obligated to provide such records, ES&S shall provide such records immediately upon customer's request. ES&S shall negotiate and specify retention and public records production costs in writing with customers prior to charging said fees. In absence of meeting such conditions of approval, ES&S shall not charge customer for work performed pursuant to a proper public records request, except for the "actual, necessary, and direct" charge of responding to the records request, as that is defined and interpreted in Wisconsin law, plus shipping, handling, and chain of custody.

7. The Wisconsin application for approval contains a condition that requires the vendor to reimburse the WEC for all costs associated with the testing campaign and certification process. ES&S agreed to this requirement on the applications submitted to WEC on September 11, 2018 requesting the approval of EVS 5.2.4.0 and 5.3.4.0.

IX. Proposed Motion

MOTION: The Wisconsin Elections Commission adopts the staff's recommendations for approval of the ES&S voting system's Application for Approval of EVS 5.2.4.0 in compliance with US EAC certificate ESSEVS5240 including the conditions described above and the ES&S voting system's Application for Approval of EVS 5.3.4.0 including the conditions described above, to also include ExpressLink approval.

Appendices

- Appendix A: Wisconsin Statutes § 5.91
- Appendix B: Wisconsin Administrative Code Ch. EL 7
- Appendix C: US-EAC Certificate of Conformance / Scope of Certification
- Appendix D: *Voting Systems Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices in Wisconsin*
- Appendix E: ExpressLink Testing Protocol
- Appendix F: DS200 Write-In Report Pilot Test Protocol
- Appendix G: Wisconsin Voting Equipment Review Panel Feedback

Appendix A: Wis. Stat. § 5.91

5.91 Requisites for approval of ballots, devices and equipment. No ballot, voting device, automatic tabulating equipment, or related equipment and materials to be used in an electronic voting system may be utilized in this state unless it is certified by the commission. The commission may revoke its certification of any ballot, device, equipment, or materials at any time for cause. The commission may certify any such voting device, automatic tabulating equipment, or related equipment or materials regardless of whether any such item is approved by the federal election assistance commission, but the commission may not certify any ballot, device, equipment, or material to be used in an electronic voting system unless it fulfills the following requirements:

(1) It enables an elector to vote in secrecy and to select the party for which an elector will vote in secrecy at a partisan primary election.

(3) Except in primary elections, it enables an elector to vote for a ticket selected in part from the nominees of one party, and in part from the nominees of other parties, and in part from independent candidates and in part of candidates whose names are written in by the elector.

(4) It enables an elector to vote for a ticket of his or her own selection for any person for any office for whom he or she may desire to vote whenever write-in votes are permitted.

(5) It accommodates all referenda to be submitted to the electors in the form provided by law.

(6) The voting device or machine permits an elector in a primary election to vote for the candidates of the recognized political party of his or her choice, and the automatic tabulating equipment or machine rejects any ballot on which votes are cast in the primary of more than one recognized political party, except where a party designation is made or where an elector casts write-in votes for candidates of more than one party on a ballot that is distributed to the elector.

(7) It permits an elector to vote at an election for all persons and offices for whom and for which the elector is lawfully entitled to vote; to vote for as many persons for an office as the elector is entitled to vote for; to vote for or against any question upon which the elector is entitled to vote; and it rejects all choices recorded on a ballot for an office or a measure if the number of choices exceeds the number which an elector is entitled to vote for on such office or on such measure, except where an elector casts excess write-in votes upon a ballot that is distributed to the elector.

(8) It permits an elector, at a presidential or gubernatorial election, by one action to vote for the candidates of a party for president and vice president or for governor and lieutenant governor, respectively.

(9) It prevents an elector from voting for the same person more than once for the same office, except where an elector casts excess write-in votes upon a ballot that is distributed to the elector.

(10) It is suitably designed for the purpose used, of durable construction, and is usable safely, securely, efficiently and accurately in the conduct of elections and counting of ballots.

(11) It records correctly and counts accurately every vote properly cast and maintains a cumulative tally of the total votes cast that is retrievable in the event of a power outage, evacuation or malfunction so that the records of votes cast prior to the time that the problem occurs is preserved.

(12) It minimizes the possibility of disenfranchisement of electors as the result of failure to understand the method of operation or utilization or malfunction of the ballot, voting device, automatic tabulating equipment or related equipment or materials.

(13) The automatic tabulating equipment authorized for use in connection with the system includes a mechanism which makes the operator aware of whether the equipment is malfunctioning in such a way that an inaccurate tabulation of the votes could be obtained.

(14) It does not employ any mechanism by which a ballot is punched or punctured to record the votes cast by an elector.

(15) It permits an elector to privately verify the votes selected by the elector before casting his or her ballot.

(16) It provides an elector with the opportunity to change his or her votes and to correct any error or to obtain a replacement for a spoiled ballot prior to casting his or her ballot.

(17) Unless the ballot is counted at a central counting location, it includes a mechanism for notifying an elector who attempts to cast an excess number of votes for a single office that his or her votes for that office will not be counted, and provides the elector with an opportunity to correct his or her ballot or to receive and cast a replacement ballot.

(18) If the device consists of an electronic voting machine, it generates a complete, permanent paper record showing all votes cast by each elector, that is verifiable by the elector, by either visual or nonvisual means as appropriate, before the elector leaves the voting area, and that enables a manual count or recount of each vote cast by the elector.

History: 1979 c. 311; 1983 a. 484; 1985 a. 304; 2001 a. 16; 2003 a. 265; 2005 a. 92; 2011 a. 23, 32; 2015 a. 118 s. 266 (10); 2015 a. 261; 2017 a. 365 s. 111.

Cross-reference: See also ch. EL 7, Wis. adm. code.

Appendix B: Wis. Admin. Code Ch. EL 7

Chapter EL 7

APPROVAL OF ELECTRONIC VOTING EQUIPMENT

EL 7.01 Application for approval of electronic voting system.
EL 7.02 Agency testing of electronic voting system.
EL 7.03 Continuing approval of electronic voting system.

Note: Chapter ElBd 7 was renumbered chapter GAB 7 under s. 13.92 (4) (b) 1., Stats., and corrections made under s. 13.92 (4) (b) 7., Stats., Register April 2008 No. 628. **Chapter GAB 7 was renumbered Chapter EL 7 under s. 13.92 (4) (b) 1., Stats., Register June 2016 No. 726.**

EL 7.01 Application for approval of electronic voting system.

(1) An application for approval of an electronic voting system shall be accompanied by all of the following:

(a) A signed agreement that the vendor shall pay all costs, related to approval of the system, incurred by the elections commission, its designees and the vendor.

(b) Complete specifications for all hardware, firmware and software.

(c) All technical manuals and documentation related to the system.

(d) Complete instruction materials necessary for the operation of the equipment and a description of training available to users and purchasers.

(e) Reports from an independent testing authority accredited by the national association of state election directors (NASED) demonstrating that the voting system conforms to all the standards recommended by the federal elections commission.

(f) A signed agreement requiring that the vendor shall immediately notify the elections commission of any modification to the voting system and requiring that the vendor will not offer, for use, sale or lease, any modified voting system, if the elections commission notifies the vendor that the modifications require that the system be approved again.

(g) A list showing all the states and municipalities in which the system has been approved for use and the length of time that the equipment has been in use in those jurisdictions.

(2) The commission shall determine if the application is complete and, if it is, shall so notify the vendor in writing. If it is not complete, the elections commission shall so notify the vendor and shall detail any insufficiencies.

(3) If the application is complete, the vendor shall prepare the

voting system for three mock elections, using offices, referenda questions and candidates provided by the elections commission.

History: Cr. Register, June, 2000, No. 534, eff. 7−1−00; **correction in (1) (a), (f), (2), (3) made under s. 13.92 (4) (b) 6., Stats., Register June 2016 No. 726.**

EL 7.02 Agency testing of electronic voting system.
(1) The elections commission shall conduct a test of a voting system, submitted for approval under s. EL 7.01, to ensure that it meets the criteria set out in s. 5.91, Stats. The test shall be conducted using a mock election for the partisan primary, a mock general election with both a presidential and gubernatorial vote, and a mock nonpartisan election combined with a presidential preference vote.
(2) The elections commission may use a panel of local election officials and electors to assist in its review of the voting system.
(3) The elections commission may require that the voting system be used in an actual election as a condition of approval.
History: Cr. Register, June, 2000, No. 534, eff. 7−1−00; **correction in (1) to (3) made under s. 13.92 (4) (b) 6., Stats., and correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register June 2016 No. 726.**

EL 7.03 Continuing approval of electronic voting system.

(1) The elections commission may revoke the approval of any existing electronic voting system if it does not comply with the provisions of this chapter. As a condition of maintaining the elections commission's approval for the use of the voting system, the vendor shall inform the elections commission of all changes in the hardware, firmware and software and all jurisdictions using the voting system.
(2) The vendor shall, at its own expense, furnish, to an agent approved by the elections commission, for placement in escrow, a copy of the programs, documentation and source code used for any election in the state.
(3) The electronic voting system must be capable of transferring the data contained in the system to an electronic recording medium, pursuant to the provisions of s. 7.23, Stats.
(4) The vendor shall ensure that election results can be exported on election night into a statewide database developed by the elections commission.
(5) For good cause shown, the elections commission may exempt any electronic voting system from strict compliance with this chapter.

History: Cr. Register, June, 2000, No. 534, eff. 7−1−00; **correction in (1), (4), (5) made under s. 13.92 (4) (b) 6., Stats. and corrections in (5) made under s. 13.92 (4) (b) 7., Stats., and s. 35.17, Stats., Register June 2016 No. 726.**

Appendix C: US-EAC Certificate of Conformance / Scope of Certification
(Begins on next page)

United States Election Assistance Commission

Certificate of Conformance

ES&S EVS 5.2.4.0

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 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: EVS

Model or Version: 5.2.4.0

Name of VSTL: Pro V&V

EAC Certification Number: ESSEVS5240

Date Issued: June 5, 2018

Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Manufacturer: *Election Systems & Software* **Laboratory:** *Pro V&V*

Certificate: *ESSEVS5240* **Date:** *June 5, 2018*

Scope of Certification

System Name: *EVS 5.2.4.0* **Standard:** *VVSG 1.0 (2005)*

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:

ES&S EVS 5.2.4.0 is comprised of the ExpressVote® Universal Voting System version 1.0 (ExpressVote 1.0), ExpressVote® (versions 2.1.0.0, and 2.1.2.0) Universal Voting System (ExpressVote 2.1), DS200® Precinct Digital Scanner and Tabulator (DS200), DS450® Central Count Digital Scanner and Tabulator (DS450), DS850® Central Count Digital Scanner and Tabulator (DS850), AutoMARK® Voter Assist Terminal (AutoMARK) versions A100, A200 & A300, Electionware® Election Management System (Electionware), Election Reporting Manager® (ERM), ES&S Event Log Service (ELS), Removable Media Service (RMS), ExpressVote Previewer and VAT Previewer.

- The ExpressVote is a universal vote capture device designed for all voters, with independent voter-verifiable paper record that is digitally scanned for tabulation. This system combines paper-based voting with touch screen technology. The ExpressVote includes a mandatory vote summary screen that requires voters to confirm or revise selections prior to printing the summary of ballot selections using the internal thermal printer. Once printed, ES&S ballot scanners process the vote summary card. The ExpressVote can serve all voters, including those with special needs, allowing voters to cast ballots autonomously. ES&S has fully integrated the ExpressVote with the existing suite of ES&S voting system products.
- DS200 digital scanner is a paper ballot tabulator designed for use as a polling place scanner. After the voter makes their selections on their paper ballot, their ballot or vote summary card is inserted into the unit for immediate tabulation. Both sides of the ballot are scanned at the same time using a high-resolution image-scanning device that produces ballot images.
- The DS450 is a scanner and tabulator that simultaneously scans the front and back of a paper ballot and/or vote summary card. It can also handle folded ballots and can read ballots in any of four orientations. The DS450 sorts tabulated ballots into discrete output bins without interrupting scanning. Optionally, this device may be configured to transmit tabulation results to the results server through a closed network connection rather than using physically transported USB flash drives.
- The DS850 is a digital scan central ballot tabulator that uses cameras and imaging algorithms to capture voter selections on the front and back of a ballot, evaluate results and then sort ballots into discrete bins without interrupting scanning. A dedicated audit printer generates a continuous event log. Machine level reports are produced from a second, laser printer. The scanner saves voter selections and ballot images to an internal hard disk and exports results to a USB flash drive for processing with Election Reporting Manager. Optionally, this device may be configured to transmit tabulation results to the results server through a closed network connection rather than using physically transported USB flash drives.
- AutoMARK enables voters who are visually or physically impaired and voters more comfortable reading or hearing instructions and choices in an alternative language to privately mark optical scan ballots. The AutoMARK supports navigation through touchscreen, physical keypad or ADA support peripheral such as a sip and puff device or two-position switch.
- Electionware integrates the election administration functionality into a unified application. Its intended use is to define an election and create the resultant media files used by the ExpressVote, DS200, AutoMARK, DS450, DS850, and ERM. An integrated ballot viewer allows election officials to view the scanned ballot and captured ballot data side-by-side and produce ballot reports.
- ERM generates paper and electronic reports for election workers, candidates, and the media. Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot

data is tabulated, and send the results reports directly to the media outlets. ERM supports accumulation and combination of ballot results data from all ES&S tabulators.

- ELS is a Windows Service that runs in the background of any active EMS software application to monitor the proper functioning of the Windows Event Viewer. The ELS closes any active ES&S software application if the system detects the improper deactivation of the Windows Event Viewer.
- RMS is an application that runs in the background of the EMS client workstation and supports the installation and removal of election and results media.

The EVS 5.2.4.0 is a modified voting system configuration that includes upgrades to the components of the EVS 5.2.3.0 and introduces a new hardware version for the ExpressVote (versions 2.1.0.0 and 2.1.2.0). EVS 5.2.4.0 adds four new ExpressVote configuration options:
Quad Express Cart, MXB ExpressVote Voting Booth, ExpressVote Single Table and ExpressVote Double Table. EVS 5.2.4.0 also adds a new ADA table configuration for the AutoMARK; provides security upgrades to third-party EMS COTS products; and contains minor enhancements to Electionware and ExpressVote.

Mark Definition:

ES&S' declared level mark recognition for the DS200, DS450 and DS850 is a mark across the oval that is 0.02" long x 0.03" wide at any direction.

Tested Marking Devices:

Bic Grip Roller Pen

Language Capability:

EVS 5.2.4.0 supports English, Spanish, Chinese (Cantonese), Korean, Japanese and Bengali.

Components Included:

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

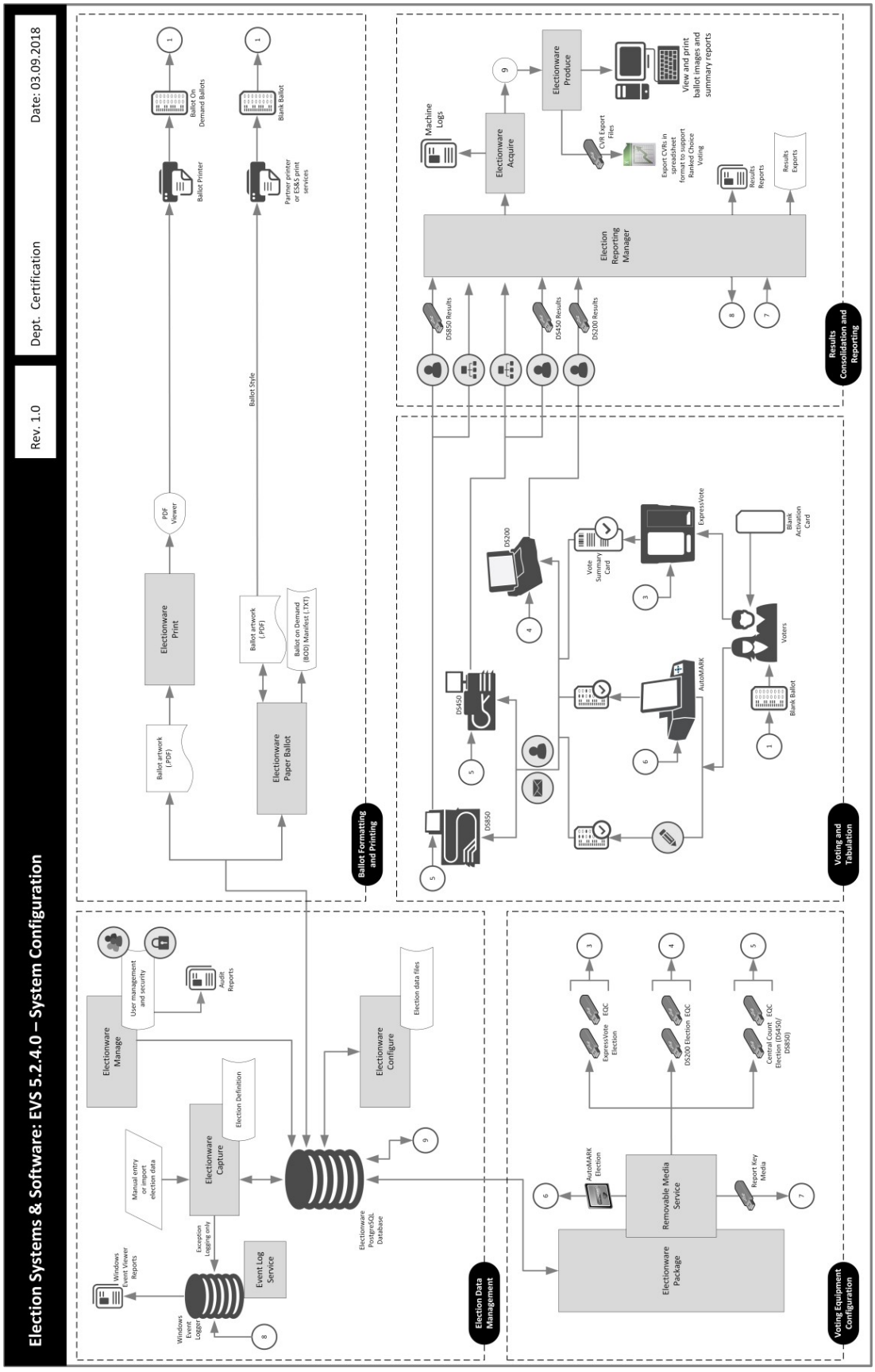
System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
ExpressVote HW 1.0	1.4.1.7	1.0		Universal Voting System
ExpressVote HW 2.1	2.4.2.0	2.1.0.0 2.1.2.0		Universal Voting System
ExpressVote Rolling Kiosk		98-00049		
ExpressVote Voting Booth		87001		Stationary Voting Booth
Quad Express Cart		41404		Portable Voting Booth
MXB ExpressVote Voting Booth		95000		Stationary Voting Booth

ExpressVote Single Table		87033		Voting Table for One Unit
ExpressVote Double Table		87032		Voting Table for Two Units
ADA Table		87031		Voting Table for One Unit
DS200	2.12.2.0	1.2.1, 1.2.3, 1.3		Precinct Count Tabulator

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
DS200 Ballot Box		1.2, 1.3, 1.4, 1.5		Plastic ballot box
DS200 Ballot Box		1.0, 1.1, 1.2		Metal ballot box
DS200 Ballot Box		98-00009		Collapsible Ballot Box
DS200 Tote Bin		00074		Tote Bin Ballot Box
DS450	3.0.0.0	1.0		Central Count Scanner and Tabulator
DS450 Cart		3002		
DS850	2.10.2.0	1.0		Central Count Scanner and Tabulator
DS850 Cart		6823		
AutoMARK A100	1.8.6.1	1.0		Ballot Marking Device
AutoMARK A200	1.8.6.1	1.1, 1.3		Ballot Marking Device
AutoMARK A300	1.8.6.1	1.3		Ballot Marking Device
AutoMARK Table		87033		
Electionware	4.7.1.4			
Election Reporting Manager (ERM)	8.12.1.1			
ES&S Event Log Service	1.5.5.0			
AutoMARK VAT Previewer	1.8.6.1			
ExpressVote Previewer	1.4.1.7 (1.0) 2.4.2.0 (2.1)			
Removable Media Service	1.4.5.0			
SecureSetup	2.0.0.1			Proprietary Hardening Script

EMS Server		Dell PowerEdge T710		
EMS Client Workstation		Dell Optiplex 980 or 5040		
EMS Client Workstation		Dell Latitude E6410		
EMS Standalone Workstation		Dell Latitude E6410		
Delkin: USB Flash Drive		512MB, 1 GB, 2 GB, 4 GB, 8 GB		Election and ballot definition media
Delkin: Validation USB Flash Drive		16 GB		Validation purposes only
Delkin: Compact Flash		1 GB		Election and ballot definition media
SanDisk: Compact Flash		512 MB, 1 GB, 2 GB		Election and ballot definition media
Delkin: CF Card Reader/Writer		6381		
System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
SanDisk: CF Card Reader		018-6305		
Headphones		Avid 86002		
Zebra QR code scanner		DS457-SR20009		Integrated with Rolling Kiosk
Symbol QR Code scanner		DS9208		External
DS450 Report Printer		Dell S2810dn		Laser report printer
DS850 Report Printer		OKI B431dn & Oki B431d		Laser report printer
DS450 and DS850 Audit Printer		Oki Microline 420		Dot Matrix Printer
DS450 UPS		APC Back-UPS Pro 1500		
DS450 and DS850 Surge Protector		Tripp Lite Spike Cube		
DS850 UPS		APC Back-UPS RS 1500 or Pro 1500		
Adobe Acrobat Standard	11		COTS	
Cerberus FTP	9.0.3.1 (64-bit)		COTS	

Microsoft Server 2008	R2 w/ SP1		COTS	
Microsoft Windows 7 Professional	SP1 (64-bit)		COTS	
WSUS Microsoft Windows Offline Update Utility	11.1.1		COTS	
Micro Focus RM/COBOL Runtime	12.06		COTS	
Symantec Endpoint Protection	14.0.1_MP1		COTS	
Symantec Endpoint Protection Intelligent Updater	20180227-001core3sdsv5i64.exe		COTS	File-Based Anti-Virus Protection
Symantec Endpoint Protection Intelligent Updater	20180226-040-IPS_IU_SEP_14RU1.exe		COTS	Network-Based AntiVirus Protection
Symantec Endpoint Protection Intelligent Updater	20180225-001-SONAR_IU_SEP.exe		COTS	Behavior-Based AntiVirus Protection


Election Systems & Software: EVS 5.2.4.0 – System Configuration
Rev. 1.0
Dept. Certification
Date: 03.09.2018
Ballot Formatting and Printing
Voting and Tabulation
Results Consolidation and Reporting
Election Data Management
Voting Equipment Configuration
Ballot On Demand Ballots
Blank Ballot
Ballot Printer
Partner printer or DS&S print services
PDF Viewer
Ballot artwork (.PDF)
Ballot Style
Electionware Print
Electionware Paper Ballot
Ballot on Demand (BOD) Manifest (.TXT)
Machine Logs
Electionware Acquire
Electionware Produce
CVR Export Files
Export CVRs in open format to support Ranked Choice Voting
View and print ballot images and summary reports
Election Reporting Manager
Results Reports
Results Exports
DS850 Results
DS450 Results
DS200 Results
DS200
DS450
DS850
Vote Summary Card
ExpressVote
AutoMARK
Blank Activation Card
Voters
Blank Ballot
Electionware Manage
User management and security
Audit Reports
Electionware Configure
Election data files
Manual entry or import election data
Electionware Capture
Election Definition
Exception Logging (.evl)
Windows Event Logger
Windows Event Viewer Reports
Event Log Service
Electionware PostgreSQL Database
ExpressVote Election
DS200 Election
Central Count Election (DS450/ DS850)
EOC
AutoMARK Election
Removable Media Service
Report Key Media
Electionware Package

System Limitations

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

System Characteristic	Boundary or Limitation	Limiting Component
Max. precincts allowed in an election	9,900	ERM
Max. count for any precinct element	500,000 (99,900 from any tabulator media)	ERM report (ERM results import)
Max. candidates allowed per election	Depends on election content (limited by 21,000 maximum counters)	ERM
Max. contests allowed in an election	Depends on election content (limited by 21,000 maximum counters)	ERM
Max. counters allowed per precinct	Limits candidates and contests assigned to a precinct to 1,000	ERM
Max. contests allowed per ballot style	200 or number of positions on ballot	N/A
Max. candidates (ballot choices) allowed per contest	175	ERM (database create)
Max. number of parties allowed	General election: 75 Primary election: 20 (including nonpartisan party)	ERM (database create)
Max. 'vote for' per contest	98	ERM (database create)
Ballot formats	All paper ballots used in an election must be the same size and contain the number of response rows.	Ballot scanning equipment
Max. Ballot Styles	9,900	ERM
Max. District Types/Groups	20	ERM
Max. districts of a given type	40	ERM

Supported Languages	• English • Spanish • Chinese (Cantonese)	• Korean • Japanese • Bengali	System Configuration

Component Limitations:

Paper Ballot Limitations

1. The paper ballot code channel, which is the series of black boxes that appear between the timing track and ballot contents, limits the number of available ballot variations depending on how a jurisdiction uses this code to differentiate ballots. The code can be used to differentiate ballots using three different fields defined as: Sequence (available codes 126,839), Type (available codes 1-30) or Split (available codes 1-40).
2. If Sequence is used as a ballot style ID, it must be unique election-wide and the Split code will always be 1. In this case the practical style limit would be 26,000.

ExpressVote

1. ExpressVote capacities exceed all documented limitations for the ES&S election management, vote tabulation and reporting system. For this reason, Election Management
System and ballot tabulator limitations define the boundaries and capabilities of the ExpressVote system as the maximum capacities of the ES&S ExpressVote are never approached during testing.

DS200

1. The ES&S DS200 configured for an early vote station does not support precinct level results reporting. An election summary report of tabulated vote totals is supported.
2. The DS200 storage limitation for write-in ballot images is 3,600 images. Each ballot image includes a single ballot face, or one side of one page.
3. Write-in image review requires a minimum 1GB of onboard RAM.
4. To successfully use the Write-In Report, ballots must span at least three vertical columns. Using two columns or fewer results in the write-in area being too large to print on the report tape.

AUTOMARK Voter Assist Terminal

1. ES&S AutoMARK capacities exceed all documented limitations for the ES&S election management, vote tabulation and reporting system. For this reason, Election Management
System and ballot tabulator limitations define the boundaries and capabilities of the AutoMARK system as the maximum capacities of the ES&S AutoMARK are never approached during testing. **Electionware**

1. Electionware capacities exceed the boundaries and limitations documented for ES&S voting equipment and election reporting software. For this reason, ERM and ballot tabulator limitations define the boundaries and capabilities of Electionware system.
2. Limits were calculated using default text sizes for ballot and report elements. Some uses and conditions, such as magnified ballot views or combining elements on printed media or ballot displays, may result in limits lower than those listed. Check printed media and displays before finalizing the election.
3. The Electionware Export Ballot Images function is limited to 250 districts per export.
4. Special characters are not supported and may not appear properly when viewed on equipment displays or reports.

5. Electionware cannot display more than 30,000 images when filtering ballot images for display. Employ one or more filters to ensure that the number of ballots viewed is less than 30,000.

Election Reporting Manager (ERM)

1. Election Reporting Manager requires a minimum monitor screen resolution of 800x600.
2. ERM Database Create allows 1,600 Precincts per Ballot Style.
3. There is a limit of 3,510 precincts in the precincts counted/not counted display.
4. There is a limit of 3,000 precincts in the precincts counted/not counted scrolling display.
5. Contest/Precinct selection pop up display limited to 3,000 contests/precincts.
6. Non-English characters are not supported in ERM. This has to do with the creation of the XML results file out of ERM.
7. ERM's maximum page size for reports is 5,000 pages.

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	No	
Accessibility		
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)	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.	Yes	
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	No	
Slate & Group Voting: one selection votes the slate.	No	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	Yes	
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	Yes	
Straight Party: Vote for each candidate individually	Yes	

Feature/Characteristic	**Yes/No**	**Comment**
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.	No	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	Yes	It is possible to list the number of voters.
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	
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	No	
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 2nd 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 2nd 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	

Feature/Characteristic	**Yes/No**	**Comment**
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	Yes	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	Yes	
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	Yes	
Overvotes: DRE: Prevented from or requires correction of overvoting.	No	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	

Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	No	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	Yes	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	Yes	
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	Yes	
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	
Networking		
Wide Area Network – Use of Modems	No	
Wide Area Network – Use of Wireless	No	
Local Area Network – Use of TCP/IP	No	
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):		
Feature/Characteristic	**Yes/No**	**Comment**
Precinct counting device	Yes	DS200
Central counting device	Yes	DS450 and/or DS850

Baseline Certification Engineering Change Orders (ECO)

There are not any ECOs certified with the voting system.

Appendix D: Voting System Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices

PART I: PROPOSED TESTING STANDARDS

Applicable VVSG Standard

The modem component of the voting system or equipment must be tested to the requirements contained in the most recent version or versions of the Voluntary Voting System Guidelines (VVSG) currently accepted for testing and certification by the U.S. Election Assistance Commission (EAC). Compliance with the applicable VVSG may be substantiated through federal certification by the EAC, through certification by another state that requires compliance with the applicable VVSG, or through testing conducted by a federally certified voting system test laboratory (VSTL) to the standards contained in the applicable VVSG. Meeting the requirements contained in the VVSG may substantiate compliance with the voting system requirements contained in Section 301 of the Help America Vote Act of 2002 (HAVA).

Access to Election Data

Provisions shall be made for authorized access to election results after closing of the polls and prior to the publication of the official canvass of the vote. Therefore, all systems must be capable of generating an export file to communicate results from the election jurisdiction to the Central processing location on election night after all results have been accumulated. The system may be designed so that results may be transferred to an alternate database or device. Access to the alternate file shall in no way affect the control, processing, and integrity of the primary file or allow the primary file to be affected in any way.

Security

All voting system functions shall prevent unauthorized access to them and preclude the execution of authorized functions in an improper sequence. System functions shall be executable only in the intended manner and order of events and under the intended conditions. Preconditions to a system function shall be logically related to the function so as to preclude its execution if the preconditions have not been met.

Accuracy

A voting system must be capable of accurately recording and reporting votes cast. Accuracy provisions shall be evidenced by the inclusion of control logic and data processing methods, which incorporate parity, and checksums, or other equivalent error detection and correction methods.

Data Integrity

A voting system shall contain provisions for maintaining the integrity of voting and audit data during an election and for a period of at least 22 months thereafter. These provisions shall include protection against:

- the interruption of electrical power, generated or induced electromagnetic radiation.

- ambient temperature and humidity.
- the failure of any data input or storage device.
- any attempt at an improper data entry or retrieval procedure.

Reliability

Successful Completion of the Logic and Accuracy test shall be determined by two criteria
- The number of failures in transmission
- and the accuracy of vote counting

The failure or connectivity rate will be determined by observing the number of relevant failures that occur during equipment operation. The accuracy is to be measured by verifying the completeness of the totals received.

PART II: TEST PROCEDURES AND PROTOCOLS

Overview of Telecommunication Test

The telecommunication test focuses on system hardware and software function and performance for the transmission of data that is used to operate the system and report election results. This test applies to the requirements for Volume I, Section 6 of the EAC 2005 VVSG. This testing is intended to complement the network security requirements found in Volume I, Section 7 of the EAC 2005 VVSG, which include requirements for voter and administrator access, availability of network service, data confidentiality, and data integrity. Most importantly, security services must restrict access to local election system components from public resources, and these services must also restrict access to voting system data while it is in transit through public networks. Compliance with Section 7, EAC 2005 VVSG shall be evidenced by a VSTL report submitted with the vendor's application for approval of a voting system.

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

Wired Modem Capability Test Plan

Test Objective: To transfer the results from the tabulator to the Election Management System via a wired network correctly.

Test Plan:

1. Attempt to transmit results prior to the closing of the polls and printing of results tape

2. Set up a telephone line simulator that contains as many as eight phone lines

3. Perform communication suite for election night reporting using a bank with as many as seven analog modems:

a. Connect the central site election management system to the telephone line simulator and connect the modems to the remaining telephone line ports
b. Setup the phone line numbers in the telephone line simulator
c. Use the simulated election to upload the election results
    i. Use at least eight tabulators in different reporting units
    ii. Use as many as two tabulators within the same reporting units
d. Simulate the following transmission anomalies
    i. Attempt to upload results from a tabulating device to a computer which is not part of the voting system
    ii. Attempt to upload results from a non-tabulating device to the central site connected to the modem bank
    iii. Attempt to load stress by simulating a denial of service (DOS) attack or attempt to upload more than one polling location results (e.g., ten or more polling locations)

Wireless Capability Test Plan

Test Objective: To transfer the results from the tabulator to EMS via a wireless network correctly.

Test Plan:

1. Attempt to transmit results prior to the closing of the polls and printing of results tape.

2. Perform wireless communication suite for election night reporting:
    a. Use the simulated election to upload the election results using wireless transfer to the secure FTP server (SFTP)
    b. Use at least eight tabulators in different reporting units
    c. Use as many as two tabulators within the same reporting unit

3. Simulate the following transmission anomalies
    a. Attempt to upload results from a tabulating device to a computer which is not part of the voting system
    b. Attempt to upload results from a non-tabulating device to the SFTP server
    c. Attempt to load stress by simulating a denial of service (DOS) attack or attempt to upload more than one polling location results (e.g., ten or more polling locations)
    d. If possible, simulate a weak signal
    e. If possible, simulate an intrusion

Test Conclusions for Wired and Wireless Transmission

- System must be capable of transferring 100% of the contents of results test packs without error for each successful transmission.

- Furthermore, system must demonstrate secure rate of transmission consistent with security requirements.

- System must demonstrate the proper functionality to ensure ease of use for clerks on election night.

- System must be configured such that the modem component remains inoperable until after the official closing of the polls and printing of one (1) copy of the results tape**.**

PART III: PROPOSED SECURITY PROCEDURES

Staff recommends that as a condition of purchase, any municipality or county which purchases this equipment and uses modem functionality must also agree to the following conditions of approval.

1. Devices which may be incorporated in or attached to components of the system for the purpose of transmitting tabulation data to another data processing system, printing system, or display device shall not be used for the preparation or printing of an official canvass of the vote unless they conform to a data interchange and interface structure and protocol which incorporates some form of error checking.

2. Any jurisdiction using a modeming solution to transfer results from the polling place to the central count location may not activate the modem functionality until after the polling place closes.

3. Any municipality using modeming technology must have one set of results printed before it attempts to modem any data.

4. Any municipality purchasing and using modem technology to transfer results from the polling location to the central count location must conduct an audit of the voting equipment after the conclusion of the canvass process.

5. Default passwords provided by ES&S to county/municipality must be changed upon receipt of equipment.

6. Counties must change their passwords after every election.

PART IV: CONDITIONS FOR APPROVAL (VENDOR)

Additionally, staff recommends that, as a condition/continuing condition of approval, ES&S shall:

1. Reimburse actual costs incurred by the G.A.B. and local election officials, where applicable, in examining the system *(including travel and lodging)* pursuant to state processes.

2. Configure modem component to remain inoperative (incapable of either receiving or sending transmissions) prior to the closing of the polls and the printing of tabulated results.

APPENDIX E: ExpressLink Testing Protocol

WEC Protocol for Approving the Elections Systems and Software ExpressLink Component

Background

As part of an application submitted on March 17, 2017, Elections Systems and Software (ES&S) requested the Wisconsin Elections Commission (WEC) to certify the ExpressLink component as part of the EVS 5.2.2.0 and EVS 5.3.2.0 systems. ExpressLink was outside of the scope of certification that was granted by the Elections Assistance Commission (EAC) for those systems. The WEC staff review of the application materials for EVS 5.2.2.0 and EVS 5.3.2.0 determined that this component was part of the voting system and should be subject to testing and certification, contrary to the EAC review. This component was not included in the voting equipment system that was certified for use in Wisconsin by the WEC on June 20, 2017. Staff was instructed, however, to create a protocol to test and certify the ExpressLink component outside of the EAC process. Wis. Stat. § 5.91 provides that the WEC may certify any such voting device, automatic tabulating equipment, or related equipment or materials regardless of whether any such system is approved by the EAC and this protocol outlines the procedures for reviewing the ExpressLink consistent with this statutory authority.

Component Information

The ExpressLink is designed for use by election officials in conjunction with the ExpressVote Universal Voting System that was approved as part of the EVS 5.2.20 and EVS 5.3.2.0 systems. This voting system component consists of both the ExpressLink software application and one piece of hardware, the ExpressVote Activation Card Printer. ExpressLink is a Windows application housed on a laptop computer that uses contest and candidate information imported from Election Ware election management system to determine the appropriate ballot style for a voter. The system then prints the activation barcode using the ExpressVote Activation Card Printer. The ExpressVote Activation Card Printer is a small, thermal, on demand printer used to print the ballot activation barcode on the ExpressVote ballot card. A voter would then use the ballot card that contains the barcode printed via the ExpressLink to activate the correct ballot style on the ExpressVote Universal Voting System.

Review and Testing Process

1. WEC staff shall complete a review of supporting documentation provided by the vendor that details the functionality of the ExpressLink before functional testing is conducted. The manufacturer shall provide both a full and a redacted set of the following documentation as part of the process to review the component, if applicable:

    a. Complete specifications for all hardware, firmware and software;

    b. All technical manuals and documentation related to the component;

    c. Complete instruction materials necessary for the operation of the equipment and a description of training available to users and purchasers;

    d. Reports from voting system test laboratories accredited by the US Election Assistance Commission (EAC) demonstrating that the system component functions as described by the vendor in the application materials.

e. A list of all the states and municipalities in which the system has been approved for use and how long the ExpressLink component has been in use in those jurisdictions.

f. If any portion of the materials provided to the Wisconsin Elections Commission is copyrighted, trademarked, or otherwise trade secret, the application shall include written assertion of any protected interests and redacted versions of the application and all materials consistent with any properly asserted protected interests. Simply identifying the individual item as "proprietary" is not sufficient. Any assertion of proprietary rights must include detailed specifics of each item protected, the factual and legal basis for protection, whether there is anything public within the protected item, and if there is, how to extract it along with a statement whether there are costs to do so.

g. If applicable, provide the WEC with a list of software components, pursuant to Wis. Stat. § 5.905, that "record and tally the votes cast with this system." For purposes of this condition, "software components" include vote-counting source code, table structures, modules, program narratives and other human-readable computer instructions used to count votes with this system.

2. The vendor shall submit the component to the WEC for functional testing. The hardware and software submitted for certification testing shall be equivalent, in form and function, to the actual production versions of the component.

    a. An operational status check shall be conducted on the ExpressLink to determine if it functions as described by the vendor using the following procedures:

        i. Arrange the system for normal operation and power on the system.
        ii. Perform any servicing, and make any adjustments necessary, to achieve operational status.
        iii. Operate the equipment in all modes, demonstrating all functions and features that would be used during election operations.
        iv. Commission staff shall verify that all system functions have been correctly executed.

    b. Compatibility of the voting system software components or subsystems with one another, and with other components of the voting system environment, shall be determined through functional tests integrating the voting system software with the remainder of the system and to determine if the software meets the vendor's design specifications.

        i. The election definition file that is created in ElectionWare for use with the ExpressLink shall be verified to determine if the data contained in that file is accurate.
        ii. The ExpressLink will be tested in a mock election to determine if it can print barcodes on ExpressVote ballot cards that access the correct ballot styles.

iii. The ExpressLink will be tested to determine if it can accommodate multiple ballot styles for an election on a single ExpressVote machine.

Conditions for Approval (vendor)

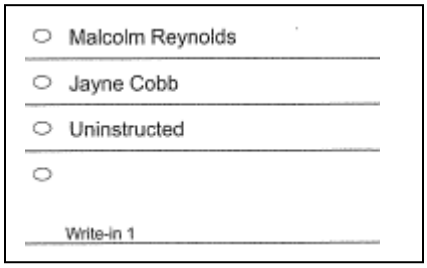
Additionally, staff recommends that, as a condition/continuing condition of approval, ES&S shall:

1. Reimburse the WEC for all costs associated with the testing campaign for the ExpressLink, where applicable, pursuant to state processes.

2. Agree to any additional conditions for approval and use that may be identified after the review and testing process is complete.

APPENDIX F: DS200 Write-In Report Testing and Pilot Test Protocol

In response to clerk interest as well as pending legislation, Commission staff conducted testing on the write-in report functionality of the DS200. Staff created a pilot testing protocol to account for and review how the DS200 would capture images of write-in votes in several scenarios and how the machine would display the write-in votes on the report that would be used to tabulate those votes. These scenarios included circumstances such as write-in votes with a blank oval or a write-in vote as part of an overvote or crossover vote. A total of 80 ballots were marked based on a customized test deck utilizing the election definitions from the General and Presidential Preference test elections. When the write-in report is enabled on the DS200, the write-in area on the ballot is roughly twice the size of what it would normally be, as illustrated by the example to the right.



The larger write-in area is required to ensure that write-in votes where the corresponding oval is not filled in by the voter will be captured on the write-in report. This programming must be done to allow for write-in votes to be tabulated in accordance with Wis. Stat. §7.50(d), which states that "If an elector writes a person's name in the proper space for write-in candidates for an office, it is a vote for the person written in for the office indicated, regardless of whether the elector strikes the names appearing in the same column for the same office, or places a mark by the same or any other name for the same office, or omits placing a mark to the right of the name written in". Under the proposed legislation, ballots cast via electronic voting equipment during the in-person absentee voting period would not be reviewed for write-in votes and all tabulation of write-in votes would be done using the output on the write-in report created by the voting equipment.

When programming a ballot with the larger write-in area, it is not possible to have multiple candidate lines represented. Write-in vote areas with two candidate lines are used in both Presidential and Gubernatorial elections in Wisconsin. The programming for the DS200 was unable to accommodate this style of write-in field.

Testing showed that the write-in report functionality records images of write-in votes correctly and accurately. Even though the write-in images are accurately tabulated, when the report is printed by the DS200 thermal printer, it is presented in a contest by contest format. At this time, there is no way to program the DS200 to print the write-in report with write-in votes organized by reporting unit. Election inspectors must review the results tape, looking at each write-in field image so that they can determine to which reporting unit the vote must be attributed. Each ballot style has the corresponding reporting unit number printed on the write-in line.

Through testing, staff learned that the write-in report on the DS200 will only work for traditional paper ballots with appropriately sized write-in lines. There is no way to program the DS200 to capture images of write-in votes on ExpressVote ballots. As with traditional paper ballots, ballots from an ExpressVote with write-in votes will be imprinted with a pink circle by the tabulator prior to being dispatched to the ballot bin. To correctly account for

write-in votes on ExpressVote ballots, they must be identified by election inspectors through a hand tally of ballots.

It is important to note that the write-in report testing was conducted on a pilot basis. Prior to further write-in report testing, staff would need to review the legislation as signed into law and gain Commission approval for an appropriate test protocol. If the Commission wishes staff to further explore DS200 write-in report testing or implementation, staff will work with Commissioners and management to address next steps.

Write-in Report Testing Checklist

Requirement	Pass: Y or N	Notes
Early voting demonstration from vendor (open polls multiple times, end of night procedures without closing polls, etc.)	Y	DS200 is simply shut down at the end of day with auto generated report cancelled by clerk; or lid can be closed and locked w/o powering down, putting it into a "sleep" mode.
Write-in report testing scenarios (outlined below): per the test deck	Y	If a ballot has write-ins that are part of a crossover or overvote situation, those votes do not appear on the report.
Write-in totals on tape and inclusion on write-in report: do they match the expected results?	Y	Since overvotes and crossover votes are not tallied nor captured on the write-in report, all contests tested reconciled.
Machine with multiple reporting units (simulate early voting scenario): Are the write-in records itemized by ward/precinct/reporting unit?	N	EVS5240/5340 prints the write-in report by contest. Each write-in vote is accompanied by a marker on the line that corresponds with the ward, "Write-In 1 _____" and so on. ES&S states that an upgraded version where write-ins are printed by ward is in the works. **ExpressVote cards are not able to be included on the write-in capture report. Inspectors must still find those ballots by hand. ES&S states there are no plans to change this**

1. Write-in Scenarios
    i. Oval/good vote
    ii. No oval/good vote
    iii. Oval/blank vote
    iv. Oval/w-i/overvote
    v. No oval/w-i/overvote
    vi. Oval/no w-i/overvote
    vii. Oval/crossover (PP, Pres Pref)
    viii. No oval/crossover (PP, Pres Pref)

APPENDIX G: Wisconsin Voting Equipment Review Panel's Feedback
These comments were provided via a structured feedback form.

1. **How would you rate the functionality of the equipment?**

Very Poor	Poor	Fair	Good	Excellent
			2	2

- I like the upgrade where candidates can be seen in two columns so they can be seen on one page

2. **How would you rate the accessible features?**

Very Poor	Poor	Fair	Good	Excellent
			2	2

- I appreciate tables created to hold the ExpressVotes now. We can't always count on tables of the right height being out at our locations.
- The ExpressVote is voter friendly
- Strip, or half sheet ballots, segregate the voters. If one person uses the ADA machine (ExpressVote), then one could deduce how that person voted
- On the AutoMark machine, the color of the text on the undervote warning is yellow or white. It is very difficult to read even for someone without vision issues. The audio on the AutoMark seemed to work well

3. **Rate your overall impression of the system.**

Very Poor	Poor	Fair	Good	Excellent
			2	2

- I prefer external modems. It should be verified in early voting that the system can produce precinct level results in addition to summary level.
- Very good. I just don't like having two types of ballots.