# State of Wisconsin\Government Accountability Board

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Director and General Counsel

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**MEMORANDUM**

**DATE:** For the September 1, 2015, Board Meeting

**TO:** Members, Wisconsin Government Accountability Board

**FROM:** Kevin J. Kennedy
Director and General Counsel
Government Accountability Board

Prepared and Presented by:
Matthew Kitzman
Electronic Voting Systems Election Specialist
Government Accountability Board

**SUBJECT:** Election Systems & Software (ES&S)
Petition for Approval of Electronic Voting Systems
Unity 3410 & Unity 3411 Voting Systems

## I. Introduction

Election Systems and Software is requesting that the Government Accountability Board (Board) approve the federally certified Unity 3.4.1.0 (3410) voting system and the modified Unity 3.4.1.1 (3411) voting system, for use in the State of Wisconsin. No electronic voting system may be utilized in Wisconsin unless the Board first approves the system. Wis. Stat. § 5.91 (see attached). The Board has also adopted administrative rules detailing the approval process. Wis. Admin. Code Ch. GAB 7 (see attached). Because the testing and approval process involves terminology which is technical and may be unfamiliar, a glossary of terms and acronyms is included in Appendix 2, which is attached.

The Unity 3410 is a federally tested and certified paper-based, digital optical scan voting system powered by ES&S's Unity platform, which is a modification to the previously Board approved Unity 3.4.0.0 and Unity 3.2.0.0 voting systems. The Unity 3411 is a modification of the Unity 3410, to allow for analog landline modeming of unofficial election night results. Both systems consist of four major components: the Unity Election Management Software applications (EMS); the Digital Scan 200 (DS200), a digital optical scan tabulator; the AutoMARK, an Americans with Disabilities Act (ADA) compliant ballot marking device; and the Model 100 (M-100), an optical scan tabulator. The Unity 3411 also consists of a telecommunication system for uploading unofficial election night results from a polling location to a central site, typically the county office. The telecommunication system consists of an analog landline modem and necessary Unity telecommunication software and server components.

## II. Recommendation

Board staff recommends approval of the Unity 3410 and Unity 3411 voting systems for use in the State of Wisconsin. Board staff's recommendations are located on pages 18-20, following the analysis of functional testing and telecommunication testing performed by Board staff.

## III. Background

On March 24, 2015, Board staff received an application for approval of the Unity 3410 and Unity 3411 voting systems. ES&S submitted complete specifications for hardware, firmware, and related components to the voting systems. In addition, ES&S submitted technical manuals, documentation, and instructional materials necessary for the operation of the voting systems. ES&S requested that the Board approve the federally certified Unity 3410 voting system and the modified Unity 3411 voting system. On June 30, 2015, ES&S retracted the request for approval of the Digital Scan 850 (DS850) with the Unity 3410 and Unity 3411. A revised application was received without the request for approval of the DS850.

The Voting System Test Laboratory (VSTL) responsible for testing the Unity 3410, National Technical Systems (NTS), recommended that the U.S. Election Assistance Commission (EAC) certify the Unity 3410 voting system. ES&S provided the NTS report to Board staff along with the Application for Approval. Voting systems submitted to the EAC for testing after December 13, 2007, are tested using the 2005 Voluntary Voting System Guidelines (VVSG 1.0). The EAC certified the ES&S Unity 3.4.1.0 voting system on April 4, 2014 and issued certification number: ESSUnity3410.

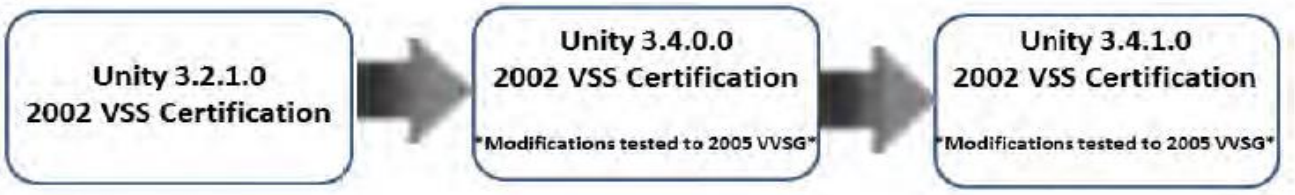
The Unity 3411 is a modification to the federally certified Unity 3410. The modification provides support for analog landline modeming of unofficial election results from a DS200 to the EMS through analog telecommunication networks. The modifications include an analog landline modem to the DS200 and the necessary software to interface with the EMS. Modifications to the Unity 3411 voting system were tested to the VVSG 1.0 by NTS. NTS notes provided ES&S with one Notice of Anomaly in the TDP, which ES&S corrected prior to NTS's final report on the Unity 3411.

Board staff scheduled voting system testing and demonstrations for the Unity 3410 and Unity 3411 voting systems on July 15-17, 2015 for functional testing and on July 22-24, 2015 for telecommunication testing. A four-person staff team conducted the testing campaigns.

ES&S did not submit a redacted technical data package (TDP) as required by the agency application; however, a full unredacted TDP was submitted. ES&S asserted that the materials are not a "record" under current Wisconsin public records laws. Wis. Stat. § 19.32(2). ES&S further requested, due to the time and expense of redacting the documentation, that the requirement be waived. Board staff proceeded with testing of the Unity 3410 and Unity 3411 voting systems and provided a letter to ES&S indicating that their application was incomplete and placing ES&S on notice concerning the implications for failing to supply a redacted TDP. A redacted TDP is requested from the vendor as part of the application for approval in the event that a public records request is made by an individual to the G.A.B. or a Wisconsin jurisdiction for the specifications of the voting system. Board staff requests a redacted TDP to

assist in the timely completion of public record requests, and to prevent copyrighted and trademarked materials from mistakenly being disclosed. Staff has advised ES&S of potential issues which may arise if a redacted TDP is not submitted, but the omission does not affect the performance, testing, or evaluation of the voting systems.

## IV. System Overview




*Certification trail of the Unity 3410.
**Unity 3411 is a modification to Unity 3410, both tested to VVSG 1.0.

The following paragraphs describe the design of the Unity 3410 and Unity 3411 hardware taken in part from ES&S technical documentation.

1. DS200

The DS200 is a digital scanner and paper ballot tabulator used primarily as a precinct counting system to tabulate paper ballots at the polling place. Each DS200 can process ballots for up to ten reporting units. After the voter makes a selection with a marker, or a ballot marking device, the ballot is inserted into the DS200 for immediate tabulation. The precinct optical scanner tabulates votes and feeds inserted ballots into an attached secured storage bin.

The DS200 includes a 12.1 inch touch screen display to provide feedback to the voter on the disposition of his or her ballot. If any errors or irregularities (overvote/crossover vote/blank ballot) are identified, the voter has the ability to return the ballot for review, or instruct the DS200 to read it as-is. Both sides of the ballots are scanned using a high-resolution image-scanning device, and the votes and ballot images of an election are stored on an external USB flash drive. The flash drive with the election results and ballot images can be removed and transported to the central tabulation location. The DS200 does not store any ballot data, election totals or election images in its internal memory.

The DS200 includes an internal thermal printer for the printing of zero reports at the opening of the polls, status reports, log reports, and polling place totals upon the official closing of the polls. The DS200 has the option for an internal landline modem to transmit totals to the central accumulation site for results consolidation after the polls are closed. The modem functionality is only supported with the Unity 3411 release.

2. M-100

The M-100 is an optical precinct ballot scanner and tabulator. Voters make their selections and then insert their ballots directly into the M-100 at the polling place. As soon as a voter inserts the ballot, the scanner tabulates votes, sorts the ballot, and then feeds it into the attached ballot storage bin. The M-100 includes a small screen display to provide feedback to the voter on the disposition of their ballot, but the screen is not large enough to accommodate the entire

warning message without scrolling to the next page. If any errors or irregularities (overvote /crossover) are identified, the M-100 offers the voter the opportunity to reject or accept the ballot. Both sides of the ballots are scanned using a high-resolution image-scanning device. The M-100 tabulates the votes and produces a printed report of the vote count together with report data stored on a battery backed-up memory card. The memory card with the results can be removed and transported to the central tabulation location.

3. AutoMARK

The AutoMARK Voter Assist Terminal (VAT) is comprised of a color touch screen monitor and integral ballot printer. To use the device, the voter inserts a pre-printed blank ballot into the input tray of the device. The mechanism draws in the ballot and scans a preprinted bar code on the ballot to determine which form of ballot has been inserted. The AutoMARK then displays a series of menu-driven voting choices on its screen. The voter uses the touch screen or key pad provided to make voting selections. The AutoMARK stores these choices in its internal memory.

When the voter has completed the selection process, the AutoMARK provides a summary report for the voter to review his or her choices, and the AutoMARK marks the ballot using its built-in printer. The print mechanism is a duplex device and can print both sides of the ballot. When the printing of the ballot is completed, the AutoMARK feeds the ballot back to the voter. Once the ballot has been marked and is provided to the voter, the AutoMARK clears its internal memory and the paper ballot is the only lasting record of the voting selections made. The voter may visually confirm his or her selections, or the ballot may be re-inserted into the AutoMARK and the voter selections summary report will provide an audio summary for voters with visual impairments. The voter proceeds to enter the ballot into optical scan voting equipment for tabulation or a secured ballot box to be hand tabulated by inspectors after the polls close.

Overvotes and crossover votes cannot occur on this equipment and a voter is warned about undervotes prior to the completion of voting. The AutoMARK generates audio voting instructions that guide a visually impaired voter through the election sequence. The voter wears headphones to hear the spoken instructions. The voter makes his or her selections by pressing on a specially designed switch panel. The voter can adjust the volume and the screen may be "blacked out" to deactivate the LCD screen, to provide enhanced privacy. The voter may adjust the tempo (speed) of the audio instructions and the AutoMARK accommodates a sip-and-puff device for voters who do not have use of their hands. The AutoMARK can be programmed in multiple languages, although languages other than English are not currently required in most Wisconsin municipalities. The City of Milwaukee is subject to a Spanish language requirement under Section 203 of the Voting Rights Act and the AutoMARK accommodates that requirement.

*Unity 3.4.1.0*

1. Hardware

ES&S submitted the following equipment for testing:

| ***Equipment*** | ***Hardware Version(s)/Make and Model*** | ***Firmware Version*** | ***Type*** |
|---|---|---|---|
| DS200 | 1.2, 1.2.3, 1.3 | 1.7.0.0 | Digital Optical Precinct Tabulator |
| AutoMARK* | 1.0, 1.1, 1.3 | 1.3.2907 | ADA compliant Ballot Marking Device |
| M-100* | 1.3 | 5.4.4.5 | Optical Precinct Tabulator |

* No testing was performed on the AutoMARK or M-100 by Board staff because no modifications were made to the components of the AutoMARK, M-100, or the EMS software related to programming or tabulation.

2. Software

The Unity 3410 is powered by a set of EMS applications. The intended use is to define an election and to create the files used by the DS200, AutoMARK, and M-100. The complete EMS software platform consists of client (end-user) and server (back-end) applications, which are itemized below. Unity 3410 operates on Windows 7, which is an upgrade from previous Unity systems. Previous systems operated on Windows XP, but Microsoft no longer provides support or patches for Windows XP.

ES&S submitted the following software for testing:

| ***Software*** | ***Version*** |
|---|---|
| Audit Manager* | 7.5.2.0 |
| Election Data Manager | 7.8.2.0 |
| ESS Image Manager | 7.7.2.0 |
| Hardware Programming Manager | 5.9.0.0 |
| Election Reporting Manager | 7.9.0.0 |
| AIMS* | 1.3.257 |
| ES&S Log Monitor Service | 1.1.0.0 |
| VAT Previewer* | 1.3.2907 |

*No change was made from the previously approved Unity 3400 and 3401 voting systems.

*Unity 3.4.1.1*

1. Hardware

ES&S submitted the following equipment for testing:

| ***Equipment*** | ***Hardware Version(s)/Make and Model*** | ***Firmware Version*** | ***Type*** |
|---|---|---|---|
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| AutoMARK* | 1.0, 1.1, 1.3 | 1.3.2907 | ADA compliant Ballot Marking Device |
| M-100* | 1.3 | 5.4.4.5 | Optical Precinct Tabulator |
| Multi-Tech Socket Modem | MT5600SMI | | DS200 embedded modem |

* No testing was performed on the AutoMARK or M-100 by Board staff because no modifications were made to the components of the AutoMARK, M-100, or the EMS software related to programming or tabulation.

2. Software

The Unity 3410 is powered by a set of EMS applications. The intended use is to define an election and to create the files used by the DS200, AutoMARK, and M-100. The complete EMS software platform consists of client (end-user) and server (back-end) applications, which are itemized below. The Unity 3411 voting system is designed to use the EMS, the DS200, and commercial off-the-shelf (COTS) items to allow analog landline modeming of unofficial election night results. Unity 3410 operates on Windows 7, which is an upgrade from previous Unity systems. Previous systems operated on Windows XP, but Microsoft no longer provides support or patches for Windows XP.

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| ***Software*** | ***Version*** |
|---|---|
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| AIMS* | 1.3.257 |
| ES&S Log Monitor Service | 1.1.0.0 |
| VAT Previewer* | 1.3.2907 |
| | |
| Cerberus FTP Server | 6.0.7.1 |
| IPSwitch WS_FTP 12 | 12.4.1 |
| Kiwi Syslog Server | 9.4.1 |

*No change was made from the previously approved Unity 3400 and 3401 voting systems.

## V. Functional Testing

As required by Wis. Admin. Code 7.02(1), Board staff conducted three mock elections with each component of the Unity 3410 and Unity 3411 voting systems to ensure the voting systems conform to all Wisconsin requirements. The test elections included a partisan primary, a general election with both a presidential and gubernatorial vote, and a nonpartisan election combined with a presidential preference vote. Each mock election included three wards. A partisan special election was placed on the nonpartisan election ballot and a nonpartisan special election was placed on the partisan primary ballot to test whether the voting equipment could account for two separate elections on the same ballot.

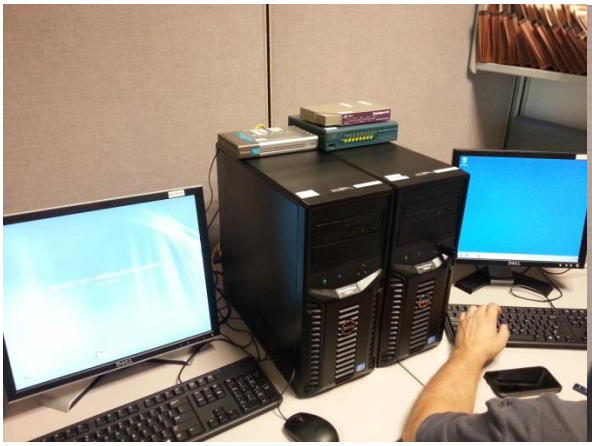
Board staff designed a test deck of 914 ballots using various configurations of votes over the three mock elections to verify the accuracy and functional capabilities of the Unity 3410 and Unity 3411 voting systems. 897 test ballots were provided by ES&S and marked by Board staff. 17 test ballots were provided by ES&S and marked by ES&S according to the specifications provided to ES&S by Board staff.[1] Board staff fed the ballots from each of the three elections through a different DS200. The nonpartisan election combined with a presidential preference vote and the general election with both a presidential and gubernatorial vote were fed into the 1.3 version of the DS200. The partisan primary was fed into the 1.2 version of the DS200. Board staff was able to reconcile the three mock elections on each DS200 submitted for testing.

## VI. Telecommunication Testing

Board staff conducted testing of the Unity 3411 voting system based on the *Voting Systems Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices in Wisconsin* which the Board adopted on May 21, 2013. Staff conducted testing in three counties: Douglas, Eau Claire, and Marathon on July 22-24, 2015. All three counties were selected because of their interest in purchasing the new ES&S Unity voting systems, their location in the state, or the availability of clerks to participate during the testing dates. In consultation with each county clerk, Board staff selected three municipalities in each county to serve as locations for testing. The municipalities were selected in part because of the strength of the wireless networks in the community or lack thereof, the service providers used by each municipality, or the municipal clerk's willingness to host the testing team and process.

The analog modem for the DS200 is an internal modem and communicates through an analog landline network at the polling location to a central office location, such as the county clerk's office. A firewall provides a buffer between the network, 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 used a key to open a panel on the DS200, closed the polls, and entered a password. The network is configured to only allow valid connections to connect to the Secure File Transfer Protocol (SFTP) server. The firewall further restricts the flow and connectivity of traffic.

[1] These 17 ballots were testing the threshold at which the DS200 indicates a mark should count as a vote, which is a mark .2 by .03 inches in any orientation.



*The entire server/county set-up

*The modem/IP switches

The Unity 3411 system supports modeming of unofficial election night results through various service providers, which can be reviewed in the table below.

| Service Provider | County |
|---|---|
| Charter | Douglas |
| CenturyLink | Douglas |
| AT&T | Eau Claire |
| Frontier | Eau Claire |
| CenturyLink | Eau Claire |
| Charter | Marathon |
| TDS | Marathon |
| Frontier | Marathon |

*This is not an exhaustive list of service providers that can transmit results. It is expected that every service provider in Wisconsin will be able to successfully transmit results.

Four Board staff members conducted the telecommunication tests, with two representatives from ES&S in each county to provide technical support. ES&S provided the necessary equipment for testing, including three DS200s with analog modems and a portable EMS environment, which included a SFTP client, two servers, and a firewall for modeming. In each county, ES&S set up the portable EMS environment in a county office to receive test election results from each municipal testing location.[2] In each municipal location, a Board staff member inserted a pre-marked package of 10 to 14 test ballots through a DS200 to create an election results packet to transmit to the county office. A Board staff member was present at each county office to observe how the portable EMS environment handled the transmissions. Board staff was able to reconcile each telecommunication test with the printed results tape and the modemed-in results.

To transmit election night results from a DS200, after the polls close, an election inspector selects the modem results button on the DS200 and is prompted to enter a password and verify the number the DS200 will dial. Once the inspector verifies or inputs a number to dial, the modem is activated by the system. If not successful immediately, the DS200 will make up to

[2] ES&S traveled to each county and municipality the week prior to the telecommunication testing to check the analog phone lines in each county and municipal location chosen for testing.

20 attempts to connect to the server, by dialing the number programmed, before timing out. Failed modem attempts can occur with analog landline modeming when multiple municipal locations are attempting to modem results simultaneously to a single county office with only one analog landline connected to receive results; if the municipal location only has one analog landline and a fax was attempting to come in; or if the quality of the analog lines between the municipality and county is inadequate. During a single attempt to connect a failed connection message will display on the screen and "Dial Error: Connect Script Failed" will be printed on the tape. If 20 connection attempts are made during a single modeming attempt, the DS200 will display a message that the modem attempt failed and "ERROR: Modem Setup Failed" will be printed on the tape.

Once election results have successfully been submitted to the county, the DS200 will display a message indicating that the results have been successfully sent and a "Modem Transfer Success" message will be printed on the tape. Once the results have successfully been sent to the county the modem is deactivated by the voting equipment. The following table summarizes the results of the transmission tests.

1. Douglas County[3]

| **Municipality** | **Able to connect** | **Able to transmit** | **Successful Transmission rate*** *Connects/attempts* | **Total Connection Attempts**** |
|---|---|---|---|---|
| Village of Lake Nebagamon | Yes | Yes | 11/11 | 19 |
| Village of Solon Springs | Yes | Yes | 8/10 | 26 |
| Village of Superior | Yes | Yes | 10/10 | 25 |

2. Eau Claire County[4]

| **Municipality** | **Able to connect** | **Able to transmit** | **Successful Transmission rate*** *Connects/attempts* | **Total Connection Attempts**** |
|---|---|---|---|---|
| City of Eau Claire | Yes | Yes | 10/10 | 41 |
| Town of Drammen | Yes | Yes | 9/12 | 63 |
| Village of Fall Creek | Yes | Yes | 9/11 | 73 |

3. Marathon County

| **Municipality** | **Able to connect** | **Able to transmit** | **Successful Transmission rate*** *Connects/attempts* | **Total Connection Attempts**** |
|---|---|---|---|---|
| Town of Knowlton | Yes | Yes | 10/10 | 11 |
| Town of Wausau | Yes | Yes | 10/10 | 11 |
| Village of Edgar | Yes | Yes | 6/11 | 118[5] |

*This is the total number of times a Board staff member pressed the modem results button on the DS200.

[3] A single analog phone line was used to receive modemed results from the three municipalities. Therefore, some of the total connection attempts could be due to multiple signals coming in at the same time.
[4] A single analog phone line was used to receive modemed results from the three municipalities. Therefore, some of the total connection attempts could be due to multiple signals coming in at the same time.
[5] ES&S conducted a diagnostic of the Village of Edgar phone line to determine the reason for the excessive connection attempts and limited successful results. That report is attached.

**This is the total number of times that the DS200 tried to connect to the server to deliver a packet of results. A single modem attempt makes a maximum of 20 connections.

## VII. Public Demonstration

A public demonstration of the voting systems was held July 16, 2015, from 4:30 p.m. to 6:00 p.m. in Madison at the G.A.B. office. Members of the public were invited to use the voting systems and provide their feedback on the systems and, specifically, the DS200. Three members of the public attended the public demonstration. One individual was a cameraman from Channel 15 News. Reid Magney conducted a short interview with Channel 15 News concerning the Unity system. Feedback from the public demonstration is included in Appendix 1.

## VIII. Wisconsin Election Administration Council Demonstration

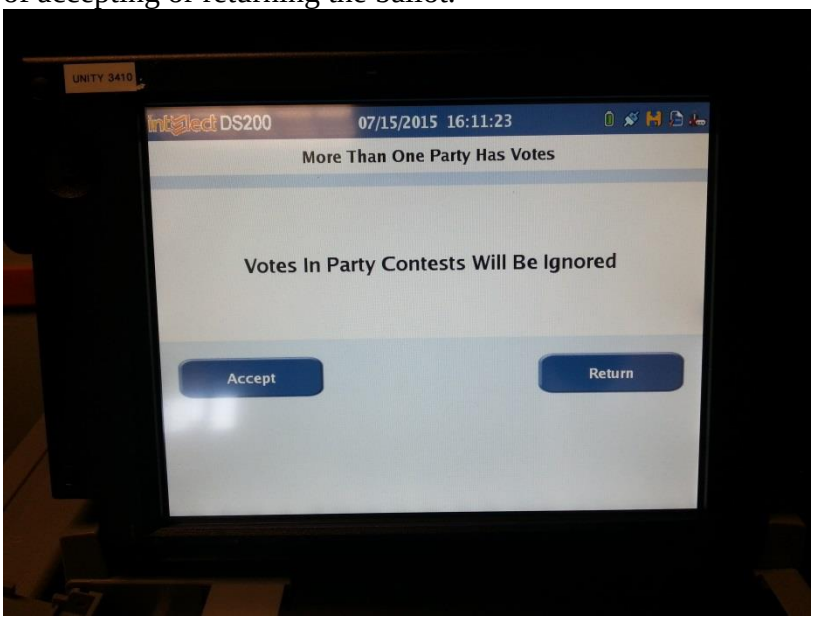
Only 3 of the 19 appointed members of the Wisconsin Election Administration Council (WI-EAC) were planning to attend the ES&S demonstration of the Unity 3410 and Unity 3411 voting systems on July 17, 2015 from 12:30 p.m. to 3:00 p.m. in Madison at the G.A.B. office. Due to several factors, including low member turnout and the minimal changes between the Unity 3410/Unity 3411 and the previously approved Unity 3400/3401, Board staff cancelled the scheduled WI-EAC meeting on July 15, 2015. All WI-EAC members were informed by email of the cancellation and a notice of cancellation was posted on July 16, 2015. The WI-EAC is composed of municipal and county clerks, representatives of the disability community, and advocates for the interests of the voting public. WI-EAC members were given the opportunity to provide written comments to Board staff on the Unity 3410 and Unity 3411 voting systems or to attend the public demonstration on July 16, 2015. No comments were provided.

## IX. Board Staff's Feedback

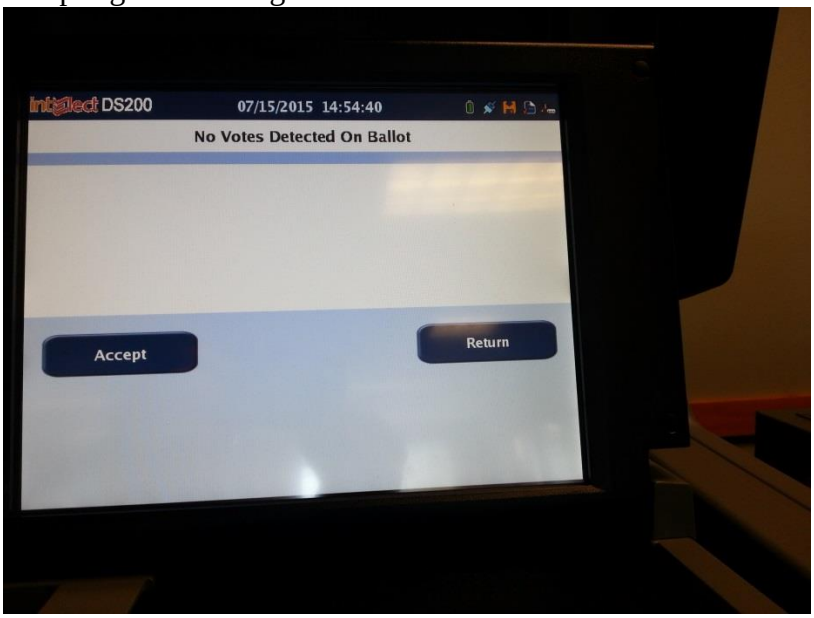
The following is a list of staff concerns and feedback regarding each component of the Unity 3410 and Unity 3411 voting systems, including equipment that was not required to be tested during this campaign.

1. The DS200 tallied ballots marked with red pen. In each of the three elections 2-4 ballots were marked with red ballpoint pen. In each election, the DS200 accurately tallied the votes for those candidates. The previously approved Unity 3400 and 3401 voting systems did not accurately tally ballots filled out with red pen. Other previous voting systems approved in the State of Wisconsin were not designed to read red pen.
2. Photocopied ballots are accepted by the equipment if the photocopy is of a high enough quality and uses identical paper size (length, width, and ratio). The G.A.B. office copier, Kyocera TASKalfa 5500i, was used to make the copies with no additional altering of resolution or contrast from the current copier settings. During testing, Board staff made two photocopies of the nonpartisan election, which was an 8½ by 14 ballot. In each circumstance the equipment read the ballot and tallied the votes.
3. Removing a ballot that was rejected due to a ballot issue (i.e. overvoted, crossover, etc.) will clear the warning message.

4. The standard for a readable mark by the Unity 3410 or Unity 3411 voting system is a mark that is .2 inches by .03 inches; however, the ballots Board staff requested ES&S mark below the standard read as a valid mark approximately 75% of the time.
5. Crossover Vote Warning: Board staff believes the warning message indicating a voter has made a crossover vote is sufficient to allow the voter to understand the implications of accepting or returning the ballot.

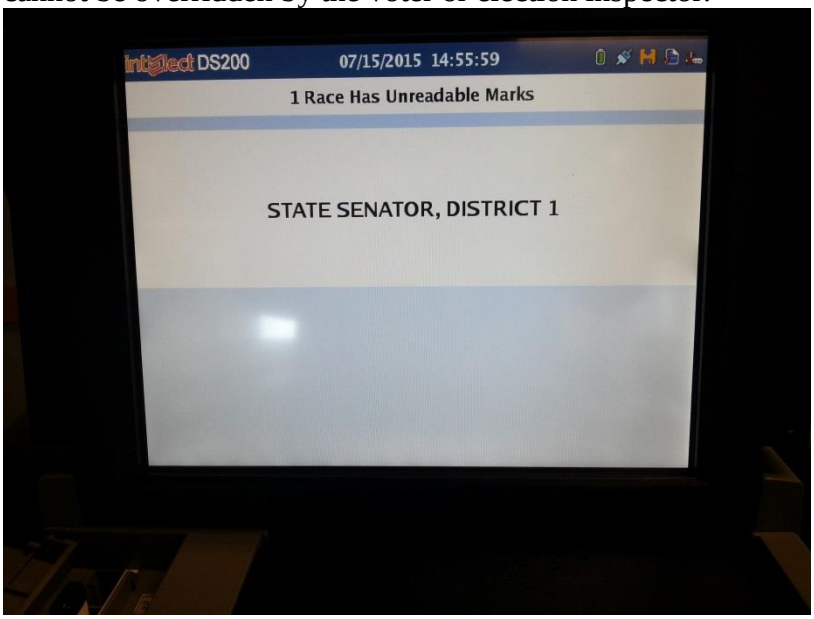



6. Blank Ballot Warning: Board staff believes the warning message indicating a voter has made a blank ballot is sufficient to allow for the voter to understand the implications of accepting or returning the ballot.

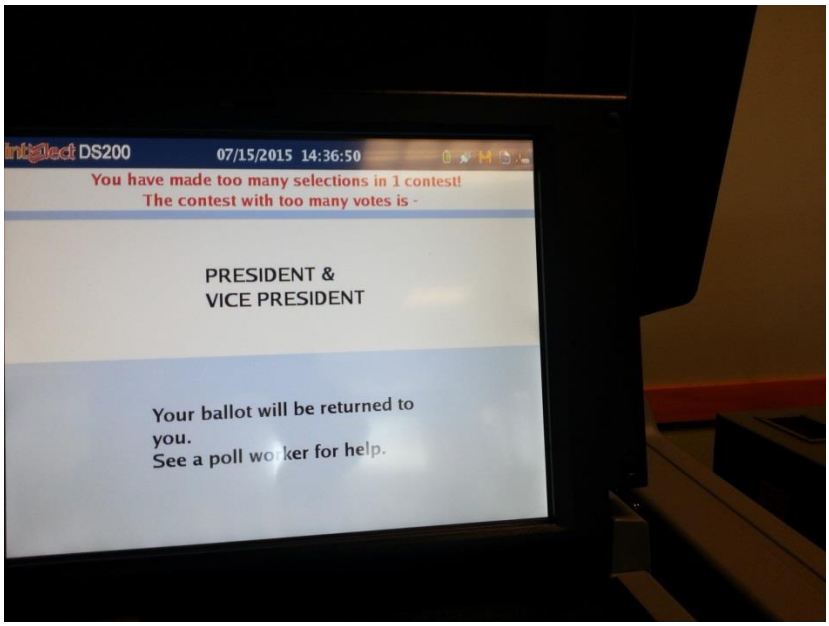



7. Marginal Mark Ballot Warning: The Unity 3410 and Unity 3411 provide a warning when a marginal mark is detected on the ballot. Ballots containing marginal marks

cannot be overridden by the voter or election inspector.




8. Overvote Ballot Warning: The EMS can be programmed to automatically reject ballots with overvotes, as is required by Wisconsin law. However, if more than one overvote is on a single ballot, the warning message will inform the voter they have placed an overvote in two or more contests at the top of the display screen in red, but it will only display the first overvoted contest in the contest display area in the middle of the screen in black.




## X. 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 Unity 3410 and Unity 3411's compliance with the standards.

**§ 5.91 (1)**

| |
|---|
| The voting system enables an elector to vote in secret. |
| Staff Analysis |
| The systems meet this requirement. |

| **§ 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 systems meet this requirement. |

| **§ 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 systems meet this requirement. |

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

| **§ 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 systems meet this requirement. |

| **§ 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 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 electors. |
| Staff Analysis |
| The 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 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 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 systems meet this requirement. |

| **§ 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 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 systems meet this requirement. |

| **§ 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 systems meet this requirement. |

| **§ 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 systems meet this requirement. Electors may review their ballots prior to placing them into the tabulators. Ballots marked by the AutoMARK Ballot Marking Device can be reviewed prior to placing the marked ballot into a tabulator. |

| **§ 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 the ballot or to receive a replacement ballot. |
| Staff Analysis |
| The systems meet this requirement. |

| **§ 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 |
| The systems do not contain a DRE; therefore, the requirement is not applicable. A voter's marked ballot is stored in the ballot box and each ballot image is saved to the memory device with the election set-up and tabulation results. |

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:<br>(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;<br><br>(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<br><br>(iii) if the voter selects votes for more than one candidate for a single office –<br>(I) notify the voter than the voter has selected more than one candidate for a single office on the ballot;<br>(II) notify the voter before the ballot is cast and counted of the effect of casting multiple votes for the office; and,<br>(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—<br>(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 systems meet these requirements. The accessible voting device is the AutoMARK, which is a currently approved piece of voting equipment in the State of Wisconsin in other voting systems. |

## XI. Conclusion

To determine whether a voting system should be approved for use in the State of Wisconsin, the following recommendations are based upon three goals.

1. Can the voting system successfully run a transparent, fair, and secure election in compliance with Wisconsin Statutes?

   Staff's Response: Yes. The Unity 3410 and Unity 3411 accurately completed the three mock elections and was able to accommodate the voting requirements of the Wisconsin election process.

2. Does the system enhance access to the electoral process for individuals with disabilities?

   Staff's Response: This system uses the previously approved AutoMARK. It maintains the same level of access to the electoral process for individuals with disabilities as other voting systems that utilize the AutoMARK as the system's accessible component.

3. Does the voting system meet Wisconsin's statutory requirements?

   Staff's Response: Yes. The Unity 3410 and Unity 3411 complies with all applicable state and federal requirements.

## XII. Recommendations

1. Board staff recommends: approval of the ES&S Unity 3410 voting system and components set forth above. This voting system accurately completed the three mock elections and was able to accommodate the voting requirements of the Wisconsin election process. Additionally, Board staff recommends approval of the ES&S Unity 3411 voting system and components set forth above. This voting system accurately completed the additional required telecommunication testing required in Wisconsin for modems. These recommendations are based on the VSTL report provided by NTS, on the Unity 3410 and Unity 3411 voting systems' successful completion of functional and telecommunication testing according to Wis. Stat. §5.91 and G.A.B. 7.02, and the *Voting Systems Standards, Testing Protocols and Procedures Pertaining to the Use of Communication Devices in Wisconsin*.

2. Board staff recommends: as a continuing condition of the Board's approval, that ES&S may not impose customer deadlines contrary to requirements provided in Wisconsin Statutes, as determined by the Board. 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.

3. Board staff recommends: as a continuing condition of the Board's approval, that these systems must always be configured to include the following options:

    a. Automatically reject all overvoted ballots, without the option to override.
    b. Provide a visual warning message, or query, when a crossover, overvote, blank, or marginal ballot is fed into the voting equipment.
    c. Capture digital ballot images of all ballots cast on the systems.

4. Board staff recommends: election inspectors shall remake all absentee ballots automatically rejected by the voting equipment, which do not have an option to override, so that the ballot count is consistent with total voter numbers.

5. Board staff recommends: voters shall spoil and fill out a new ballot or an election inspector shall remake ballots received at the polls on election day that are automatically rejected by the voting equipment, which do not have an option to override, so that the ballot count is consistent with total voter numbers.

6. Board staff recommends: election inspectors shall continue to check the main bin and review all ballots for validly cast write-in votes at the close of the polls at every election.

7. As part of EAC certificate: ESSUnity3410, only equipment included in this certificate are allowed to be used together to conduct an election in Wisconsin. Previous systems 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 Board, as this would void the EAC certificate, unless the previous equipment is listed above. If a jurisdiction upgrades to the Unity

3410, it needs to upgrade each and every component of the voting system to the requirements approved in the EAC certificate and herein. Likewise, if a jurisdiction upgrades to the Unity 3411, it needs to upgrade each and every component of the voting system to the requirements approved in the Unity 3410 base system and herein. Despite the DS850 central count tabulator being approved by the EAC in certificate ESSUnity3410, ES&S chose not to pursue approval of the DS850 in the State of Wisconsin. Municipalities that use the Unity 3410 or Unity 3411 will not be allowed to use a DS850 as part of this approval.

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

## XIII. Proposed Motion

**MOTION:** The Government Accountability Board adopts the staff's recommendations for approval of the Election Systems and Software's Application for Approval of Unity 3.4.1.0 voting system, EAC certificate ESSUnity3410, including the conditions described above.

**MOTION:** The Government Accountability Board adopts the staff's recommendations for approval of the Election Systems and Software's Application for Approval of Unity 3.4.1.1 voting system, which is a modification of the EAC approved Unity 3.4.1.0, EAC certificate ESSUnity3410, including the conditions described above.

Attachments

- ✓ Appendix 1: Public Demonstration Feedback
- ✓ Appendix 2: Glossary of Terms and Acronyms for Voting Systems
- ✓ Wisconsin Statutes § 5.91
- ✓ Wisconsin Administrative Code GAB 7
- ✓ Poll Site Phone Line Testing – Village of Edgar
- ✓ US-EAC Unity 3410 Certificate of Conformance
- ✓ US-EAC Unity 3410 Grant of Certification

## APPENDIX 1: Public Demonstration 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 |
|---|---|---|---|---|
| | 1 | | | |

- Staff recommendations for the DS200 for different versions are inconsistent. Even though the base tabulator is the same model, DS200, this version is not programmed to meet the requirements established by the Board in December 2009: *"As part of state approval, the DS200 is required to be configured to reject all overvote or cross party votes automatically, and the voter will not be provided the opportunity to 'accept' a ballot that contains these marking errors. Ballots that contain no valid votes (blank ballot) will provide a query to either 'accept' or 'return' the ballot."* These same requirement should be imposed for the DS200 version now under consideration. The quote above is from page 5 of the document at http://www.gab.wi.gov/sites/default/files/page/ess_board_memo_12_17_09_pdf_11455.pdf. In the presidential primary in April, a vote for more than one candidate for president is an overvote, regardless of whether both candidates are in the same party. This situation should be covered by statute 5.85 (2) (b) 1, which requires overvoted ballots to be remade. This usually applies only to absentee ballots, since the voter can correct in person ballots. (The word "crossover" does not appear in the statutes.)

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

| Very Poor | Poor | Fair | Good | Excellent |
|---|---|---|---|---|
| | 1 | | | |

- Does not offer any improved features. Too high for someone in a wheelchair to easily insert ballot. For someone visually impaired, there is no audio feedback (as there is on the Optech Eagle) to signal good or bad ballot.

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

| Very Poor | Poor | Fair | Good | Excellent |
|---|---|---|---|---|
| | 1 | | | |

- The goal should be to keep overvotes and crossovers to the level of the Optech Eagle, 0.11% (see memo cited above). Statute 5.91(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."*

## APPENDIX 2: Glossary of Terms and Acronyms for Voting Systems

| | | |
|---|---|---|
| ADA | Americans with Disabilities Act | A Federal act passed in 1990, which addresses civil rights issues and prohibits discrimination based on disability. |
| AIMS | AutoMARK Information Management System | Software designed to create the AutoMARK ballot layout. |
| COTS | Commercial Off The Shelf | Hardware or software that is readily available to the public. |
| DOS | Denial of Service | A cyber-attack meant to make a machine or network resource unavailable to its intended users. |
| EAC | United States Elections Assistance Commission | An independent agency created by the Help America Vote Act in 2002. The agency serves as a resource on election administration and is the federal agency responsible for adopting guidelines for the approval of voting systems, as well as the certification of voting systems to those adopted standards. |
| EMS | Election Management System | A set of programs that allow for the set-up, reporting, and configuration of elections. |
| ES&S | Election Systems & Software | A voting systems vendor. |
| HAVA | Help America Vote Act | An act passed by Congress in 2002 to reform the voting process in the United States. It was meant to address voting systems and voter access issues that were identified following the 2000 presidential election. |
| LCD | Liquid Crystal Display | A technology used in flat panel displays that use light crystals to reflect light. Traditionally used in smaller computer screens, the technology allows for displays to be much thinner than previous technologies. |
| NTS | National Technical Systems | A company authorized by the EAC to test voting systems to the current standards and guidelines of the EAC. |
| SFTP | Secure File Transfer Protocol | A method of transferring files between computers over a secure data network. |
| SNP | Sip-and-Puff | An assistive technology used to send signals to a device using air pressure by inhaling or exhaling through a tube. |
| TDP | Technical Data Package | A technical description of something |

| | | |
|---|---|---|
| | | that is adequate for supporting the production, engineering, and logistics of the hardware or software. |
| VAT | Voter Assist Terminal | A piece of voting equipment designed for use by individuals who are unable or do not want to personally mark a ballot. |
| VSTL | Voting System Test Laboratories | An independent, non-federal laboratory qualified to test voting systems to Federal standards. Section 231(b) of the Help America Vote Act. |
| VSS | Voting System Standards | A set of standards for voting systems adopted by the Federal Election Commission in 2002. This adoption was an update to the 1990 standards adopted by the Federal Election Commission. |
| VVSG | Voluntary Voting System Guidelines | The successor to the VSS, a set of guidelines adopted by the U.S. Election Assistance Commission for the certification of voting systems. The National Institute of Standards and Technology is the primary body for the drafting of these standards. |
| WI-EAC | Wisconsin Elections Administration Council | An independent committee in Wisconsin composed of municipal and county clerks, representatives of the disability community, and advocates for the interests of the voting public. The Council provides feedback to the G.A.B. regarding voting systems brought for approval in the State of Wisconsin. |

**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 approved by the board. The board may revoke its approval of any ballot, device, equipment or materials at any time for cause. No such ballot, voting device, automatic tabulating equipment or related equipment or material may be approved 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.

## Chapter GAB 7
## APPROVAL OF ELECTRONIC VOTING EQUIPMENT

**GAB 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 board, 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 board 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 board 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 board shall determine if the application is complete and, if it is, shall so notify the vendor in writing. If it is not complete, the board 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 board.

**GAB 7.02 Agency testing of electronic voting system.**

**(1)** The board shall conduct a test of a voting system, submitted for approval under s. GAB 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 board may use a panel of local election officials and electors to assist in its review of the voting system.

**(3)** The board may require that the voting system be used in an actual election as a condition of approval.

**GAB 7.03 Continuing approval of electronic voting system.**

**(1)** The board 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 board's approval for the use of the voting system, the vendor shall inform the board 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 board, 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 board.

**(5)** For good cause shown, the board may exempt any electronic voting system from strict compliance with ch. GAB 7.