Elections Division
Office of the Secretary of State

Report of the Secretary of State on the Examination
of ES&S EVS 5.2.2.0 Voting System

February 2017
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Overview

Application

On December 28, 2016 ES&S submitted an application for Washington State Certification of EVS 5.2.2.0. ES&S applied to certify the optical scan voting system software and hardware (version numbers listed under the National Certification section below). Copies of operating and maintenance manuals, training materials, technical and operational specifications were provided.

Current Voting System

This system is considered an optical scan voting system and contains ElectionWare and ERM software with the ExpressVote universal voting device, DS850 & DS450 central tabulator, DS200 precinct tabulator and AutoMARK.

This is a brand new release and is not yet in use in any other states. This is a modification of the currently certified EVS 5.2.0.0.

Modified Voting System

EVS 5.2.2.0 is a modification to the currently state certified EVS 5.2.0.0 voting system. The EVS 5.2.2.0 voting system adds the DS450 tabulation along with other small changes.

National Certification

After the completion of testing by a certified Voting System Test Lab (VSTL) the Election Assistance Commission (EAC) certified EVS 5.2.2.0 on February 27, 2017. The following hardware and software of the system have been approved by the EAC:

Software
- ElectionWare v. 4.7.1.1
- Event Log Service (ELS) v. 1.5.5.0
- Removable Media Service (RMS) v. 1.4.5.0
- Election Reporting Manager (ERM) v. 8.12.1.1
- ExpressVote Previewer v. 1.4.1.2
- VAT Previewer v. 1.8.6.1
- ExpressLink 1.3.0.0
• Toolbox 3.1.0.0

Hardware
• DS200, Precinct tabulator, Firmware v. 2.12.2.0, Hardware v. 1.2, 1.3
• DS850, Central scanner, Firmware v. 2.10.2.0, Hardware v. 1.0
• DS450, Central scanner, Firmware v. 3.0.0.0, Hardware v. 1.0
• ExpressVote, Universal voting device, Firmware v. 1.4.1.2, Hardware v. 1.0
• AutoMARK Voter Assist Terminal
  • A100 (H/W/Rev 1.0) v. 1.8.6.1
  • A200 (H/W/Rev 1.1, 1.3) v. 1.8.6.1
  • A300 (H/W/Rev 1.3) v. 1.8.6.1
• ExpressVote Activation Card Printer

Testing & Inspection

Testing and evaluation of EVS 5.2.2.0 was conducted in coordination with Adams County Elections staff and Secretary of State staff at the Adams County Courthouse in Ritzville, WA on February 9, 2017. Examining the system for the Office of the Secretary of State was Stuart Holmes, Voting Information Systems (VIS) Manager.

Due to EVS 5.2.2.0 having gone through Voting System Test Laboratory (VSTL) testing and submitted to the EAC for National Certification, a two phase testing program was developed and approved by Secretary of State staff for state certification testing.

**Delivery acceptance testing** of the equipment and software to determine if the correct model and versions of the equipment and software are delivered and that the equipment, software and system operate as documented by the vendor.

**Election Results Testing** to ensure that the equipment, software and system perform each of the functions required by federal, state and local law in order to administer an election from the beginning to the end.
Executive Summary of Findings of Secretary of State Staff

System Limitations

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<th>System characteristic</th>
<th>Boundary or limitation</th>
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<th>Notes or conditions</th>
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<td>Max. precincts allowed in an election</td>
<td>At least 9000</td>
<td>ERM</td>
<td></td>
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| Max. count for any precinct element | 500,000 (99,990 from any tabulator media) | ERM report (ERM results import) | Calculation of the number of counters must include a minimum of 4 counters for each contest, 8 overhead (overvote, undervote, precincts counted) and at least 1 candidate. Additional contest candidates each add a counter. If some precincts are defined as absentee, a fourth overhead counter (absentee precincts counted) must be added to each contest. The number of statistical counters (Ballots Cast, Registered voters) must be added to the contest counters to determine the total.
| 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 | Example of maximum contest calculation if all contests had 1 candidates (5 counters each; 3 overhead counters 4 2 candidates) and there were 10 statistical counters (Ballets Cast, Total, Republican, Democratic, Libertarian, Nonpartisan and Registered Voters-Total, Republican, Democratic, Libertarian, Nonpartisan.) (21000 - 20)/3 = ERM or (counter limit – statistics x 2)/number of counters/number of contests.
| Max. counters allowed per precinct | Limits candidates and contests assigned to a precinct to 1,000 | ERM | Context counters are calculated as indicated for “Max candidates allowed per election,” but two counters must be added for each statistical counter defined for the precinct. There are a minimum of 3 statistical counters assigned to each precinct (4 count added counters), “Ballots Cast,” “Registered Voters” and “Ballots Cast Blank.”
| Max. contests allowed per ballot type | 200 or # of positions on ballot | ERM | |
| Max. candidates (ballot choices) allowed per contest | 276 | 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. Notable paper ballots must contain the same number of rows. | ERM | Ballot scanning equipment
| Max. Ballot Styles | 8900 | ERM | |
| Max. District Types/Groups | 20 | ERM | |
| Max. districts of a given type | 40 | ERM | Excludes the ElectionWide Group which contains all precincts.

Supported Languages
- English
- Spanish
- Chinese
- Korean
- Japanese
- Bengali

Voting System Accuracy

A testing environment was setup at the Adams County Courthouse with a DS850 central count scanner, a DS200 precinct tabulator and a DS450 central count scanner. 225 ballots were run through the scanners and results were compared to the predetermined testing matrix.

At each stage of the testing the results were compared to the expected results in the test matrix and no errors or discrepancies were found.
**Results Reporting**

As ballots are run through the central count scanners, results are being tabulated. The result reports are password protected and locked down in EVS 5.2.2.0. WAC 434-250-110 allows optical scan voting systems to begin scanning ballots after 7:00am on Election Day if the County Auditor follows a security plan that has been approved by the Secretary of State to prevent tabulation until after 8:00 p.m.. Counties that choose to use EVS 5.2.2.0 would have to have strict procedures in their security plan to prevent the release of election results prior to 8:00pm by having an administrator unlock the results at 8:00pm on Election Day.

**Ballot Scanning**

Ballots created using the ballot design software, ES&S Ballot Image Manager, do not include any serial number or identification on the ballot in any way. All ballots for a ballot style are printed from a single PDF file exported from the design software.

The EVS 5.2.2.0 software has no way of distinguishing if a ballot has been previously scanned by the tabulators. ES&S recommends teams of 3 to use the tabulators (1 staff jogging ballots, 1 staff loading ballots into scanner, 1 staff unloading ballots). In addition to accountability and ballot handling procedures, this 3 person team would prevent ballots from being scanned twice because each staff member only does one activity that takes place on each end of the machine. The staff member unloading ballots would never contact ballots that are being loaded and vice versa.

**Presidential Primary**

EVS 5.2.2.0 can perform all the functions necessary to comply with current state requirements for the Presidential Primary. It can detect cross-party voting in a Presidential Primary without manual intervention.

**System Security**

A hash value can be created that will ensure that the device’s software has not changed since its last install. This process would most likely be done by an administrator as the creation requires pulling a series of files.

**Write-ins**

The EVS 5.2.2.0 software has no way of entering individual write-in votes as they are scanned by the tabulators. Only a total count of write-ins is available in the election results. Counties would have to develop a manual process of write-in accounting or review the ballots individually after they are scanned in order to report the writes-ins
for declared or undeclared candidates. This is particularly important in the Primary where only 1% of the vote is required to appear on the General Election ballot.

However, EVS 5.2.2.0 has the ability to export images of the write-in target area in the Cast Vote Record report for easier hand counting. Additionally, the DS450 and DS850 can sort out ballots with write-ins for hand counting of write-ins.

**Conclusion**

After an evaluation of the system as upgraded, staff believes the system and its components continue to meet current Washington State requirements for Presidential Primary, Special, Primary, and General Elections.