ES&S 6200

The Election Systems and Software (ES&S) release of the EVS 6.2.0.0 election system was examined in Austin on June 22, 2022. This release is a modification to the 6.1.1.0 release which was previously certified in Texas. This release was certified by the federal Elections Assistance Commission (EAC) in December 2021. The VSTL used for the testing was Pro V&V in Huntsville, AL.

The major upgrades to the 6.2.0.0 system are: 1) the addition of the new DS950 scanner, 2) the regional site transmission capability, 3) a framework for risk limiting audit (RLA), and 4) improvement to the software validation process. There were minor hardware changes to the voting devices due to parts reaching end-of-life. None of the voting devices were functionally changed. A detailed list of all the hardware and software changes can be found in the official EAC test report.

The following table lists the modified 6.2.0.0 components used for the examination.

Table 1 - Releases for Proprietary Hardware/Software Components

Hardware/Software	Version/Firmware #	Location
Software		
Electionware (EMS)	6.2.0.0	Central office
Event Log Service	3.0.0.0	Central office
Removable Media Service	3.0.0.0	Central office
Hardware		
ExpressVote HW1.0 (BMD)	4.2.0.0	Precinct
ExpressVote HW2.1 (BMD or tabulator)	4.2.0.0	Precinct
DS200 precinct scanner 1.2 and 1.3	2.40.0.0	Precinct or central
ExpressTouch (DRE) 1.0	4.2.0.0	Precinct
ExpressVote 1.0, 2.1.0.0, 2.1.2.0, (BMD)	4.2.0.0	Precinct
DS450 scanner	4.1.0.0	Central office
DS850 scanner	4.1.0.0	Central office
DS950 scanner	4.1.0.0	Central office

For a detailed explanation of all the hardware components and applications of the 6.2.0.0 system please refer to the EAC's certification final test report.

Findings

- The responses provided on Form-101 are acceptable.
- The Technical Data Package (TDP) documentation appears to be updated with the new information.
- The EAC test report and the documentation provided by ES&S state that this is an upgrade to the 6.1.0.0 release. However, ES&S has verified that this release also includes the previously Texas certified 6.1.1.0 system.
- The system software was successfully built and witnessed by SOS staff. A sample of the programs' hash values were verified to match the values that were generated by the VSTL after the EAC testing was completed.
- The ADA testing went well; no problems reported.
- A mock election was done and the test ballots were recorded and tallied correctly.
- There is now an option to utilize YubiKey USB keys for dual factor authentication on the EMS server.
- The DS950 scanner/tabulator includes enhanced sorting options of DS450.
- The scanners/tabulators now have the ability to print tally results for any processed batch of ballots. The purpose of this enhancement is for auditing.
- The voting machines and scanners have been synchronized to use the same firmware and operating system release. This slightly reduces software development and maintenance times for releases.
- The copyright dates were removed from the voting devices and scanners. They are not required and were causing a hash mismatch during the software validation process. This would be the case if a de minimis software change was made.
- A jurisdiction can now hide checkboxes that were in the upper left corner for each candidate's selection box. The checkboxes caused unnecessary confusion for voters. A voter need only click anywhere in the larger box for the candidate.
- The barcode position cross-out change generates a box with a cross to eliminate the blank space where a barcode would be printed if a race is not under-voted. This prevents someone from manually adding a barcode or other marks in the space.
- The system now uses USB 3.0 flash drive specification which has improved throughput and capacity. The flash drives (sticks) used in the voting systems can now be up to 32GBs.

- Precinct results can now be transmitted from regional sites in the county. This is a time-saving feature used to report election results asap. It is used to transmit unofficial results only. The official results are loaded into the EMS via the USB sticks at the central count location per usual.

  The regional transmission uses a laptop at the regional site which communicates with a duplicate EMS server that is air-gapped from the official EMS server at the central location.

  All transmissions of the results are FIPS compliant. The system uses a SHA2-256 hash to encrypt the data, a virtual private network (VPN), and the sFTP client/server protocol. The regional sites must be hardwired (ethernet) to the county's network. Wireless connections are not permitted. The wireless adapter on the remote laptop is disabled.

  The regional transmission subsystem should not be turned on until after the polls close. Each USB results stick is validated using a software key before the system will transmit to the data communication server at the central site. The data communication server is connected to the duplicate (unofficial) EMS server. All activity is logged on both sides of the transmission.

  The functionality of the "unofficial" EMS should be restricted through licensing and user permissions so that it can only be used for the regional transmission and unofficial results reporting.

  Reports generated on the "official" EMS can be loaded into the "unofficial" EMS server to report on all results processed, including mail-in ballots and other ballots that were loaded directly into the official EMS on election night. All activity is logged.

- The software hash validation process has been improved. The operator no longer has to type in parameters (e.g. mount points). This reduces human error. The time to do the validation has been reduced on the voting devices and scanners. The hash validation works basically the same on all the voting devices and scanners.

  The hashes are compared to a list of hashes provided by the VSTL; they are not generated during the software installation from the golden image as was done previously.

  The EMS validation is still cumbersome and should be improved so that it takes minimal time and effort by the jurisdiction because the EMS validation is the most critical since the EMS is central to the election definition, tabulation, and reporting activity.

  In addition to the cumbersome EMS validation process, the bash shell script used to automate most of the process, can be modified easily. It would take less than a minute for a skilled operator with access to modify the script to always report "success" for the hash comparisons.

- The DS950 scanner has an auto-adjustment belt tensioner. Typically a manual adjustment is required on DS450 and DS850 scanners after a few thousand ballots are read.

- The DS850 scanner is going end-of-life due to parts. The DS950 performance is comparable to DS850, but adds the intelligent out-stacking that the DS450 has. The DS850 will continue to be supported and included in future certifications.

- There is a new RLA (risk limiting audit) capability. This is optional in Texas.

  A unique audit ID is printed on the paper ballots and stored in the electronic cast vote record (CVR). This will require a jurisdiction to have a ballot storage process that allows it to locate the exact paper ballots it wishes to compare against the CVR's stored in the EMS.

- The ExpressVote voting machines now allow for a multi-card ballot. It should not be necessary for most elections.

  A poll worker is required to select the correct ballot style on an ExpressVote at the beginning of a voting session in order for the voter to use a multi-card ballot. However, if an electronic poll book is used, the multi-card ballot style is automatically selected using the information in the ballots barcode.

  A voter is prompted to verify their selections for races on the 1st card and then is prompted to print the 1st voted ballot card. Then the voter is prompted to insert the 2nd blank card (ballot stock) to continue voting the races that will print on the second card. When inserted into the DS200 scanner to cast their ballot, the cards can be inserted in any order.

  The Public and Protective counters on the DS200 scanner will only be incremented when the 1st card is inserted, not the 2nd card. If the 1st card is not inserted or cannot be read, the counters will not be incremented. This could be a problem when trying to reconcile the number of ballots casted on a voting machine with the signature roster. However, either card can be spoiled and re-voted if necessary.

  Also, a voter could walk away after inserting only one of the two cards in the scanner. The votes on the inserted card would be recorded, but the votes on the un-inserted card would be unrecorded. If only the 2nd card was inserted, the counter problem mentioned above will occur.

- The ExpressVote XL full-face BMD is not included as part of this release.

- The High-Capacity Barcode capibility is not used in Texas.

Conclusion

The 6.2.0.0 modifications to the ES&S system cause no loss of functionality or security to the EVS system. The new DS950 scanner performs well. Other changes to the system were minor or optional. The EMS software validation is still cumbersome and should be improved.

I believe the system examined meets the requirements of the Texas Election Code. I recommend certification for the EVS 6.2.0.0 system.

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Examiner