Voting System Examination
Election Systems & Software EVS 6.2.0.0

Prepared for the Secretary of the State of Texas

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Designee of the Attorney General

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This report conveys the opinions of the Attorney General's designee from an examination of the equipment listed, pursuant to Title 9, Chapter 122 of the Texas Election Code, section 122.036(b).

Examination Scope

On June 22-23, 2022 examiners appointed by the Texas Secretary of State and Attorney General met with representatives of Election Systems & Software ("ES&S") at the offices of the Texas Secretary of State for an interactive demonstration of the EVS 6.2.0.0 system and an opportunity to test its operation.

Components of the EVS 6.2.0.0 that were examined included the following:

Components Examined	Version/ Firmware #
Hardware	
ExpressTouch	4.2.0.0
DS200 Precinct Ballot Tabulator (HW 1.2)	2.40.0.0
DS200 Precinct Ballot Tabulator (HW 1.3)	2.40.0.0
DS450 Central Ballot Tabulator	4.1.0.0
DS850 Central Ballot Tabulator	4.1.0.0
DS950 Central Ballot Tabulator	4.1.0.0
ExpressVote (HW 1.0)	4.2.0.0
ExpressVote (HW 2.1)	4.2.0.0
Software	
Electionware	6.2.0.0
Event Log Service	3.0.0.0
ExpressVote Previewer	4.2.0.0
Removable Media Service	3.0.0.0
Regional Results	1.4.0.0

Overviews of component functions and integrated system configurations are included in the *ES&S 6.2.0.0 Certification and Scope of Conformation* [document](#) of the US Election Assistance Commission ("EAC") dated December 23, 2021.

Although listed in the *Application for Texas Certification – Form 100* dated Jun 22, 2022, the following components were not included in the EAC's certification of EVS 6.2.0.0 system:

- ExpressLink
- ExpressVote Activation Card Printer
- Paperballot
- Toolbox

As such, they were not part of this examination.

Examination Process

On June 21, ES&S representatives delivered the EVS 6.2.0.0 equipment to a secure conference room in the offices of the Secretary of State. They subsequently extracted the trusted build from a hard drive provided by the Voting System Test Laboratories ("VSTL"). Examiners had an opportunity to observe this process.

June 22 was focused on the firmware and software installation and hash validation processes. Much discussion occurred between examiners and the ES&S representatives around these processes, their improvements from EVS 6.1.1.0, and remaining examiner concerns.

Accessibility and regression testing using a pre-defined election and standard set of test cases occurred on June 23. Examiners performed ad hoc testing of the voting and tabulation systems. ES&S also introduced and provided a brief demonstration of the Regional Reports deployment and operation.

Legal, legislative, and election management concerns, constraints, and requirements were discussed throughout these latter two days of the examination process.

Neither detailed demonstration by ES&S nor direct examination of Electionware features and operation were included in this process for EVS 6.2.0.0

Version Changes

EVS 6.2.0.0 is a modification of version EVS 6.1.0.0, which was certified by EAC on September 24, 2019 and by the Texas Secretary of State on April 24, 2020. In addition to updating the versions of software and firmware, EVS 6.2.0.0 has the following, notable changes from EVS 6.1.0.0:

- Added the DS950 high-speed central count scanner and tabulator
- Improved overall software performance; optimized legacy data
- Redesigned and simplified the verification process

- Added a Regional Results application for secure results transfer from regional sending sites
- Implemented printing of barcode position cross-out
- Enabled hiding of on-screen checkboxes in ExpressVote and ExpressTouch
- Implemented a multi-card vote session for ExpressVote
- Added an ability to print selected batch-level results on central count tabulators
- Implemented Risk-Limiting Audit via printing a unique audit ID on each summary card or ballot
- Introduced higher capacity USB 3.0 flash drives
- Updated end-of-life components in ExpressVote and ExpressTouch

Additional details on changes incorporated into EVS 6.2.0.0 are available in the EAC certification document referenced above.

EVS 6.1.1.0 was also a modification of version EVS 6.1.0.0; it was certified by EAC on July 28, 2020 and by the Texas Secretary of State on January 8, 2021. EAC stated that the EVS 6.1.1.0 update comprised only software performance and optimization improvements to Electionware: no firmware or hardware updates were included. All software versions in the EVS 6.2.0.0 release supersede those incorporated in EVS 6.1.1.0

Prior Examination Concerns

Although all examiners recommended certification of both EVS 6.1.0.0 and EVS 6.1.1.0, they also identified specific concerns in one or both versions that they collectively indicated ES&S should address in subsequent system versions:

- ES&S provided an optional method for setting Microsoft Windows' password to not expire on an EMS computer. Removing this option and requiring a password change at least yearly was strongly recommended. One examiner noted that an *Election Security Best Practices Guide* published by the Secretary of State's Office suggests forced password updates every 90 days. (*EVS 6.1.1.0)*

- Hash verification of software installation has been a complicated and error-prone process. Because it is vital for each jurisdiction to confirm that only software and/or firmware certified by EAC is installed on each hardware device or computer, the examiners have strongly recommended the process be significantly improved. (*EVS 6.1.1.0, EVS 6.1.0.0)*

The latter of these concerns is addressed in EVS 6.2.0.0

Key Observations

Hash Verification Process

Significant improvements to hash verification are incorporated in EVMS 6.2.0.0. ES&S makes the following statement in its document, *Key Benefits Summary: ES&S Voting System 6.2.0.0*:

"EVS6200 includes a completely redesigned and simplified verification process for all firmware and software. The new verification adds an option to export files to a USB flash drive for firmware/software validation. In addition, this release introduces verification for the Data Communication server and COTS equipment.

For this version, ES&S provides technical documentation on the hash verification procedures for the DS200, DS450, DS850, DS950, ExpressTouch, and ExpressVote hardware systems as well as the Electionware, Data Communication, and Regional Results software systems.

Although this documentation appears clear and complete, the verification process itself remains time-consuming with multiple steps, many of which require a measure of technical expertise.

The actual verification between a EAC certified hash value for an EVS 6.2.0.0 hardware component and one derived from the firmware of a particular instance of that component operating in a jurisdiction is performed on a separate PC running Ubuntu. Verification in EVS 6.2.0.0 uses Ubuntu 16.04.1. An ES&S representative has verified that Ubuntu 16.04 LTS will be support through 1Q 2026. This allays concerns among examiners that arose because the most current release with long-term committed support is 22.04.

Unlike the voting and tabulation equipment comprising EVS 6.2.0.0, the Electionware workstation, client, and server computers have their hash verification performed using PowerShell commands on the very system whose installed software is being verified. Examiners expressed concern over the possibility this opens for a verification script to be modified by someone with Administrator access so that it produces a false verification result.

Examiners requested ES&S investigate an approach for performing the verification in a separately booted OS on the computer being tested or, alternatively, an approach using a separate PC. Confidence that the software on the Election Management System has been independently verified is critical.

Regional Results Process

In EVS 6.2.0.0, ES&S introduced a new application, Regional Results, which supports sending unofficial results from a local polling location over a closed network to the central location where a jurisdiction's official version of Electionware is running and its vote tabulations are officially aggregated. In practice, a computer running Regional Results should never be collocated with the official Electionware computer.

This application provides the ability for a jurisdiction to accumulate interim, unofficial voting results in advance of receiving the physical USB with that local polling place's unofficial results. Currently, its deployment appears to pose several possible problems or risks ES&S should address:

- Essentially creating two 'accounting' systems for unofficial voting results. Conforming them may pose risks

- Mail-in ballot voting results, after being loaded into the official EMS , must somehow be transferred back to the regional polling place so that 'unofficial results' conform

- Naming conventions must be disambiguated so that an 'unofficial, unofficial' set of results transmitted using Regional Reporting is not confused with "unofficial" results provided through a 'backup' USB stick subsequently delivered from tabulators at the same polling places

- Communications with the public media must be carefully managed so that 'unofficial' unofficial results taken from Regional Reporting are not confused with 'actual' unofficial results available only from official EMS.

- An administrator's access to the Regional Reporting application must be restricted to prevent any other Electionware function from being used.

Currently, ES&S documentation for using this new application is limited. Further clarification is needed on deployment and administration of Regional Results computers as well as on the processes for using Regional Results correctly, unambiguously, and securely during an election.

Conclusions

ES&S has made significant progress with EVS 6.2.0.0 in improving the hash verification process for its voting and tabulation equipment. As noted above, I recommend the vendor continue improvements with a focus on independent verification for its software systems.

The Regional Reporting application appears to offer benefits to large jurisdictions with respect to managing unofficial voting results. However, I believe the possible problems and limited documentation noted above must be addressed for the application to be used with confidence.

Those considerations notwithstanding, I find EVS 6.2.0.0 to an effective, highly usable voting system that complies with the necessary requirements for a voting system under Texas law. As such, I recommend its certification.