Voting System Examination
Election Systems & Software (ES&S)

Prepared for the
Secretary of State of Texas

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Designee of the Attorney General

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 Date   September 5-6, 2018
Report Date   September 23, 2018

Examination of ES&S Voting System (EVS) 6.0.0.0

EAC Certification Number: ESSEVS6000

Components Examined	Version
DS200 Precinct Ballot Counter	2.17.0.0
DS450 Central Scanner and Tabulator	3.1.0.0
DS850 Central Scanner and Tabulator	3.1.0.0
Electionware	5.0.0.0
Event Log Service	1.6.0.0
ExpressLink	1.4.0.0
ExpressTouch	1.0.0.0
ExpressVote & Previewer, HW v. 1.0	1.5.0.0
ExpressVote & Previewer, HW v. 2.0	2.4.0.0
ExpressVote Activation Card Printer	NA
PaperBallot	5.0.0.0
Removable Media Service	1.5.0.0
Toolbox	3.2.0.0

Changes from Last Version Examined

ElectionWare 5.0.0.0 is a new version that integrates the reporting of results, which used to be done by a separate module. Also, the ExpressTouch is new, and has not been certified in Texas before.

ExpressTouch is a Direct-Recording Electronic (DRE) voting machine, meaning that there is no paper record of each person's vote. Instead, the voting records are stored electronically in a highly reliable, redundant electronic memory. *Redundant* means that each vote is stored in two separate memories, in case one should fail.

ExpressVote allows voting to be conveniently done using a touchscreen on a machine that then prints out a paper record called a *Voter Summary Card,* which the voter can verify before casting it. This provides the convenience of machine voting with the voter confidence that is inspired by a paper ballot.

As a side note, I want to express my opinion that the paper ballot does not actually increase the accuracy or security of a voting system, although I acknowledge that many voters feel more secure when there is a paper record, and voter confidence is very important.

ExpressVote has an optional new mode that allows it to *tabulate ballots as well as printing Voter Summary Cards*, but the vendor notified us on the day of the exam that they would not request certification of this feature in Texas. Therefore, ExpressVote cannot be used for tabulation in Texas. It must print a paper ballot that must then be scanned in order to be counted.

System Overview

EVS is a comprehensive, modern election system that supports both paper and electronic ballots.

Election setup is done using Electionware and then transported to the various Election-Day devices on encrypted USB memory sticks.

On Election Day, jurisdictions can choose to let voters mark paper ballots manually, use the ExpressVote paper ballot marker, or use the ExpressTouch DRE. Any combination of these is possible.

The Voter Summary Card contains a complete record of the voter's choices in both human-readable form (so the voter can verify it) and machine-readable form (for tabulation), so it serves the same function as a paper ballot.

At the polls, election workers first identify a voter's precinct and split. Then they can (a) use ExpressLink to print a paper activation card for ExpressVote, (b) create a chip-based smart activation card the voter can insert into the ExpressTouch, (c) give the voter a paper ballot, or (d) walk to an ExpressTouch voting machine and use a poll-worker smart card to activate the correct precinct and split on that machine for that voter.

The paper ballots and Voter Summary cards can be scanned in the precinct using the DS200, or in a central-count location using the DS450 or DS850. The results of DRE voting and the ballots scanned in the precinct are written on USB memory which is then carried to the central-count location for final tabulation.

Examination Procedures

This was a two-day examination. On the first day, we observed as the vendor installed the firmware and software using files obtained directly from the VSTL by the Secretary of State, thus providing chain of custody. Then we verified version numbers, asked technical questions, and discussed the technical aspects of the system. We also observed how the machines can be used by disabled voters, although compliance with the Americans with Disabilities Act (ADA) is verified independently by the Secretary of State's office, and is not in the purview of the examiners.

On the second day, we heard a presentation about the system, voted on the different voting stations, tabulated using each scanner, transported election results to the central-count system, and verified that the results were tabulated properly.

Observations

The chip-based smart cards used for activation and ballot selection on the ExpressTouch closely resemble a chip-enabled credit card. The ES&S team mentioned that these cards are sufficiently expensive that they should be retrieved from voters after they have voted. Because of this, they say most jurisdictions are choosing not to give the voter a card to access his or her ballot, but to (a) escort the voter to a voting machine, (b) insert a card identifying a poll worker, (c) select the proper precinct and split, (d) remove the card, and (e) withdraw so the voter can vote. This procedure may be less accurate than automatic activation, require additional pollworkers because of the time involved, and make voters concerned about pollworkers constantly moving among the machines.

Compared to the ExpressVote, this requires either more expense (for lost cards) or more pollworker time, because the ExpressVote prints a paper activation card that then becomes the voter's ballot (technically Ballot Summary Card).

Concerns

During the exam, I asked ES&S if they had addressed some problems I pointed out in my report about the EVS 5.2.4.0. Their answer was justified. They replied that my report (dated August 9,

less than a month before) had not been available in time for them to respond, since EVS 6.0.0.0 was already near the end of the certification process and certainly could not be changed.

In light of their answer, I did not recheck these items, but I am still listing them here for reference:

Crossover voting. Voters who vote a straight-party ballot, and then override by selecting a different candidate in one particular race (called crossover voting), may be very confused by the message they receive, which says "You have removed a candidate that was selected by your Straight Party vote. Your Straight Party selection will also be removed."
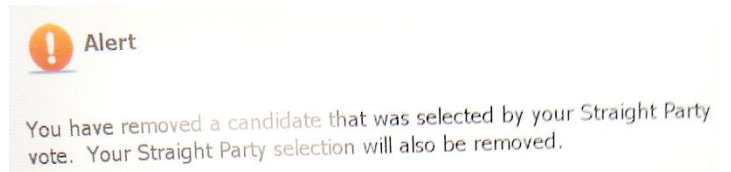
That message is very confusing, and will almost certainly be interpreted by many voters to mean that their straight-party vote has been removed from all other candidates.

I suggest a message like this: You have changed your vote for a candidate selected by your straight-party vote. Your straight-party vote remains in effect for all other candidates."

Not voting straight-party. A voter who decides against a straight-party vote receives the following message, which is also quite confusing: "Contest Not Fully Voted. You have selected fewer choices than the number allowed in this contest."

"Not Fully Voted" implies that the voter has made a mistake or overlooked something, when in fact this is a perfectly valid choice. This is exacerbated by the word "contest," because the straight-party vote is not a contest in the ordinary meaning of the word.

For the straight-party vote ***only***, I recommend completely removing this message, and instead go immediately to the first race. This is not something that requires a warning.
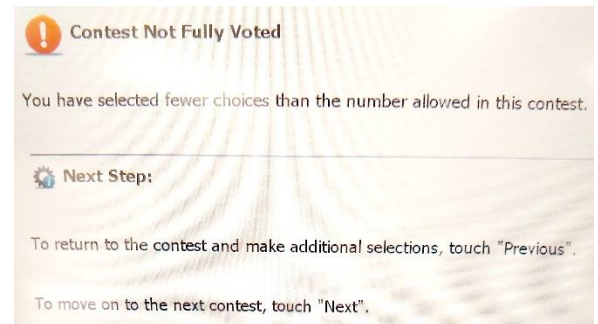
On the verification screen, it suffices to simply remove the line "Contest Not Fully Voted" from the straight-party box.

Casting the ballot. When the voter has indicated that the ballot is complete, the message is "Print Card. Your selections will now be printed on the inserted card." Since the ExpressVote is being used as a ballot marking device, and not a direct recording electronic (DRE) device, the message is perfectly accurate, and to those of us familiar with ballot-marking devices, it's perfectly clear.

However, it is not very clear for voters. To see this, consider that many voters will have previously used a DRE, and will think they are done. Others may have never voted electronically, and not understand ballot-marking devices.
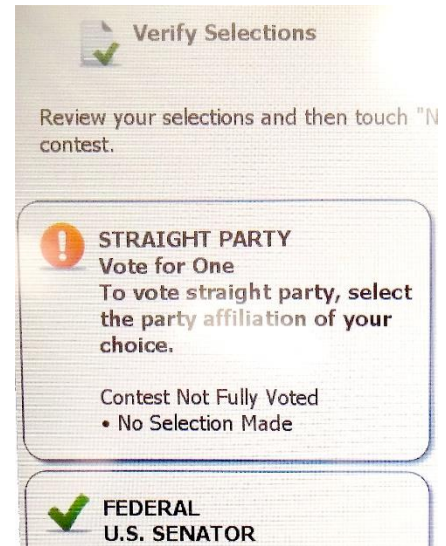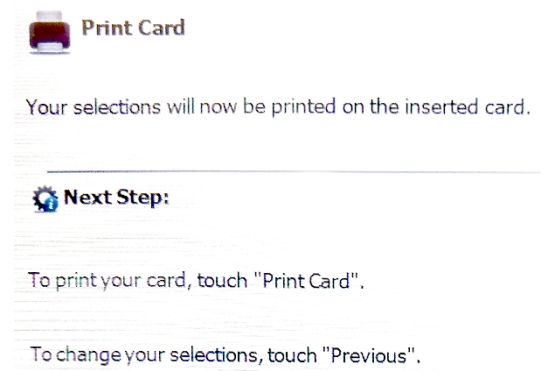
I suggest a message like this:

> **Print Card**
> Your selections will now be printed.
> To cast your ballot, insert the printed ballot into the ballot box or scanner.

This will significantly help voters to understand the process.

Summary

If the three confusing messages I identified were fixed, the EVS 6.0.0.0 would be a good election system. These concerns should not prevent certification of this version, but they should be fixed before the next certification.

I recommend certification of EVS 6.0.0.0.