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February 14, 2019

Mr. Keith Ingram
Director of Elections
Texas Secretary of State
Elections Division
208 East 10th Street
Austin, Texas 78711

Re: Inspection of the EVS 6.1.0.0 System conducted on January 15 and 16, 2020

Dear Mr. Ingram:

Pursuant to my appointment by the Texas Secretary of State as a voting systems examiner under TEXAS ELECTION CODE § 122.035, please allow this letter to serve as my report concerning the above referenced examination. I, along with the other statutory examiners and staff from the Secretary of State's office, examined the Electronic Systems & Software EVS 6.1.0.0 voting system ("**ES&S 6.1.0.0 System**") on January 15 and 16, 2020, at the offices of Elections Division of the Texas Secretary of State in Austin, Texas.

The other examiners and I inspected the above referenced software and equipment and accompanying written materials for compliance with the relevant provisions of the TEXAS ELECTION CODE and Texas Administrative Code related to the requirements for election machines and software.

The ES&S 6.1.0.0 System is the next version of the ES&S voting system that has many similarities to the previous ES&S systems approved by the Secretary including the 6.0.4.0 and 6.0.2.0 Systems. The 6.1.0.0 System's only substantive changes relate to a new Windows operating system, some configurations that can be used with XL machine (the large screen voting kiosk) and some miscellaneous changes in the Electionware portion of the System.

ACCESSIBILITY TESTING

On the first day of the inspection, others tested the physical equipment of the ES&S 6.1.0.0 System for accessibility compliance with the applicable state laws and regulations. These tests confirmed that the ES&S 6.1.0.0 System complied with the accessibility requirements of Texas law.

TESTING OF HARDWARE AND SOFTWARE

On the first day of the examination, ES&S completed the loading and installation of the ES&S 6.1.0.0 System. However, the load process and hash tag validation took much longer than it usually did. This issue with hash tag validation is discussed below

On the second day of the examination, ES&S provided the examiners an overview of the changes to the 6.1.0.0 System. The examiners posed several questions that were answered by ES&S officials; however, the one question that led to much more discussion was previously reported problems during an election in Pennsylvania using ES&S equipment. Again, this issue is also discussed in more detail below.

Later on the second day, the examiners tested each piece of equipment and software for security, functionality and accuracy. The examiners and staff cast a script of ballots on each voting machine and paper ballots were fed into the optical scanners. The mock votes were tabulated and sorted with the new election software.

At the conclusion of the voting tests, the issues with the hash tag validation and issues raised in the Pennsylvania election were further discussed and some functional testing related to both of those issues were conducted.

OBSERVATIONS

General Observations

1. Each of the separate pieces of hardware and software examined met the listed requirements of the TEXAS ELECTION CODE and TEXAS ADMINISTRATIVE CODE.
2. As has been the case with previously reviewed systems, the requirement for sequentially numbered ballots that are randomized in the manner in which they are provided to voters may present a problem under the ES&S 6.1.0.0 System. The 6.1.0.0 System can print serial numbers using a letter to identify a polling place. That may mean that two ballots at separate polling locations may have the same serial number and just a different letter identifier.
3. As noted in my past reports, the complete training of the purchasers of the ES&S 6.1.0.0 System is not a static item that is included in the basic purchase of a System. While Texas law and applicable regulations do not set standards for training, leaving the decision of how much or what training a customer receives to the customer (that is likely seeking to save money) could lead to problems. This is especially true as it relates to specific programming of election definitions and formatting.
4. On the XL screen, the programming of ballots appeared to put the selections immediately touching one another. Without space or a bolder border between the potential selections, it may be easy for a voter to inadvertently select an adjacent

choice on the screen. Space or heavier lines between the selections would help avoid this issue.

Hash Tag Validation

The technical examiners noted that the hash tag validation process on Day One took an extremely long time and they generally questioned the process. It appeared the validation process for the election management software seemed to miss the policy behind the process because the system generated its own control set of hash tags that were to be compared against the installed program's hash tags. In other words, there is not an independent source for the "golden" hash tags that were the control set that the system hash tags were supposed to match.

When the examiners presented this problem to ES&S, its response was that this process met VVSG standards. After a review of the VVSG standards, the examiners did conclude that ES&S was technically correct about this process being compliant with VVSG standards based on a literal reading of those standards. However, the hash tag validation process has much less value to show that the program being installed matches the EAC approved programs unless there is an independent source for "golden" hash tags from a trusted source (such as a read only CD from EAC, etc.). This is because the point of the hash tag validation process is to confirm through independent means that the program a customer is about to install is the same program approved by the EAC and state certification to guard against tampering, manipulation or alteration of the program. When the same system a customer is installing generates the control set of hash tags against which a system's hash tags is compared, this goal is not really met since manipulation can occur with the "control" set as well.

Previous Problems in Pennsylvania

As previously noted, a problem occurred in Pennsylvania during an election in which it appears programming of the voting screen on an XL device allowed two "boxes" to be programmed on top of one another such that selection of one box lead to a reading by the machine that the voter selected the other box. Specifically, there was a text box in the Pennsylvania election in the middle of the ballot that appeared to be on "top" of another box that contained a candidate such that when a voter selected the candidate, it registered that the voter was selecting the text box (and a vote for the intended candidate was not cast).

ES&S stated that the mistake was human error and should have been caught in Logic and Accuracy testing before the election. Moreover, in the actual cast vote record on the printed page that the XL produced, the same issue was not present in the bar codes or other information read by a separate tabulating machine. This meant that the correct tabulation of the votes occurred if the tabulation was done using printed ballots from the selections made on the XL, but was incorrect if the tabulation was done internally in the XL machine. Because the XL is not used as

a tabulator in Texas, this problem should not likely arise in a Texas election. However, what is still unclear is if this same issue could be replicated on the Express Touch that is used for curbside voting and a tabulator.

ES&S expressed that it was working on a remedy for this issue, but believed the human error that caused it should have been caught before the election. This potential for human error and the significant consequences it could have in not correctly reporting voter intent is a serious concern even if it has limited applicability in Texas.

RECOMMENDATION

Based on the foregoing observations and my examination of the ES&S 6.1.0.0 System, its accompanying literature and the representations made by ES&S officials both in its literature and at the examination, I recommend that the ES&S 6.1.0.0 System be certified as compliant with the requirements of the TEXAS ELECTION CODE and the TEXAS ADMINISTRATIVE CODE with the following conditions to certification:

- (1) ES&S should be required to provide a specific set of instructions and explanations to its Texas customers concerning the past problems in Pennsylvania and carefully warn the customers about the best ways to avoid the same programming errors; and
- (2) ES&S modify its has tag validation procedures for its election management software to include a hardened CD of “golden” hash tags from the EAC to be used in the process rather than allowing the system to generate its own control hash tags for the process

This report should not be construed as a tacit or implied comment on any of the technical aspects of the ES&S 6.1.0.0 System except as expressly stated herein. In the event any of the equipment, software or security devices examined are altered, changed or decertified by any accrediting agency (other than a “minor modification qualified for administrative certification process” as that term is defined in § 81.65 of the Texas Administrative Code), this report should be considered withdrawn.

Thank you for the opportunity to serve as an examiner and participate in this important process that protects the integrity of Texas’ voting systems.

Sincerely,



Brandon T. Hurley

