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Re: Election System & Software ("ES&S")-Unity Election System V. 2.4.2; iVotronic DRE, V. 8.0.0.0; Votronic DRE, V. 5.19; Model 100 Precinct Count System, V. 5.0.0.0; Model 150/550 Central Count, V. 2.1.0.0Q; Model 650 Central Count, V. 1.2.0.0; the Optech Eagle Precinct Count, V. HPS 1.28, APS 1.50, CPS 1.02a, and the Optech IV-C Central Count, V. 1.06a.

Dear Ms. McGeehan:

Pursuant to my appointment as an examiner under Chapt. 122, Texas Election Code, I examined the above referenced software and hardware (collectively the "Election Systems") as presented by ES&S for examination. I examined the Election Systems with respect to Texas Election Law and procedure on January 8, 2004.

This report is concerned solely with the ability of the Election Systems, and each individual module thereof, to function in compliance with Texas Election Law, and is based on the presentation by ES&S and the testing completed by the examiners on January 8th. ES&S gave a well organized presentation, and the casting, tabulation and reporting of votes, together with the remainder of the examination, did not evidence any function that was not in compliance with Chapt. 122, Subchapt. A, Texas Election Code, for use in an election, except as specifically noted below. However, no opinion is expressed regarding the suitability of the Election System for the purposes of or use by any jurisdiction.

The Unity Election System v. 2.4.2 functions with all of the ES&S product line referenced above. And, in that respect, the testing and examination of the Election Systems was divided roughly into three parts. One grouping consisted of the Votronic voting station, the Optech Eagle and the Optech IV-C. A second group consisted of the Model 100, the Model 650 and the Model 150/550. The iVotronic was also voted and included in the tabulation. The

third grouping was election central and the tabulation and reporting of the election results from each of the above groups.

The earlier versions of the above referenced machines, devices and increments of the Election System have been previously certified.

Group One. A test deck of ballots was provided and the examiners added a material number of additional ballots, all to be read and processed separately through the Optech Eagle and the Optech IV-C. The Votronic was included in this group and additional votes were cast on the Votronic. Other than inclusion of the Votronic for convenience, this group was configured because it uses "arrow" ballots. The results from the Optech Eagle, the Optech IV-C and the Votronic were each separately verified, and then all were transported to election central for a central count combined tabulation and election report. Due to an issue, discussed below, additional ballots were cast and this process from the precinct level through election central was repeated. Except as noted specifically below, the examination and testing evidenced that the machines and devices included in Group One, and Unity Election System v. 2.4.2 functioning with the group as election central, operated in compliance with Chapt. 122, Texas Election Code.

Group Two. Except for the retesting and re-voting, the above process was also completed on the iVotronic, the Model 100, the Model 650 and the Model 150/550. Again, except as noted specifically below, the examination and testing evidenced that the machines and devices included in Group Two, and Unity Election System v. 2.4.2 functioning with the group as election central, operated in compliance with Chapt. 122, Texas Election Code.

Exceptions and recommendations.

Exception No. 1. Tabulation of Paper Ballots. (1) Felt tip pens were provided and used in the marking of the paper ballots. This resulted in the Optech IV-C and the other tabulation models reading and recording as a vote a bleed through mark from the opposite side of the ballot. *Recommendation.* (a) I recommend the Secretary prohibit the use of felt tip markers with this Election System, and specify the pens or markers that may be used with this Election System. (b) I also recommend a procedure be adopted that requires double-sided paper ballots to have one side be "off-set" in a manner that will prevent a ballot mark in a race on one side of the ballot from lining up with a ballot mark for a race on the opposite side. The "bleed through" issue is potentially material. And, there is a real potential for such an event to affect a race and not be discovered unless a recount is requested.

Exception No. 2. Tabulation of Paper Ballots. The Optech IV-C read one very lightly marked vote approximately 50% of the time as a vote and 50% of the time as blank. This may be unavoidable, but the preference is that it read the ballot the same way each time. *Recommendation.* I recommend the Secretary give this matter some consideration in conjunction with Exception No. 1 above. It appears whether or not the tabulation device records the vote, or does not, may depend in part on the way the ballot is positioned when it runs through the tabulation device. However, this may be an issue that can only be effectively addressed in a hand recount.

Exception No. 3. Ballot Set-Up. At least in part due to all standard procedures not being followed in setting-up the test ballot, the candidate names were switched on one race. Except for a careful audit, the resulting error would not have been found and the votes for the candidates would have been reversed. ES&S states that adequate procedures are in place, between their proofing ballots and the election program and requiring the election jurisdiction to also proof the ballots. *Recommendation.* I recommend the staff review this issue to determine if any additional procedure or requirement will prevent this potentially serious possibility. One possibility would appear to require specific pre-testing by race prior to final election set-up.

Exception No. 4. Audit Log Printer. The Unity Election System at election central has a functioning audit log printer. However, at least some functions on the audit log printer are still not recorded on a real-time basis. For example, one observed failure to record real-time was that if the election system is exited or closed the audit log does not record that action until the next time when the election program is started up or accessed. *Recommendation.* I recommend the Secretary require the real-time audit log printer to record on a real-time basis each event, function or interface with the election system.

Summary.

Properly used with the appropriate procedures and avoidance of human error that can be present in any election, the Election System appears generally to function in compliance with the Texas Election Code, and to accurately tabulate and report results. However, there are several recommendations for improvements that should be required pursuant to Chapt. 122, Texas Election Code.

I recommend the iVotronic and Votronic be certified as meeting the requirements of Chapt. 122, Subchapt. A, Texas Election Code.

I recommend the Unity Election System V. 2.4.2 central election reporting programs be certified as meeting the requirements of

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Chapt. 122, Subchapt. A, Texas Election Code, subject to the following: (1) the real-time audit log printer being modified to require every event be printed and logged real time; (2) procedures being adopted to require specific race by race testing of the tabulation software and the paper ballots prior to the certification of the ballot -- to make certain the names and places in the electronic election set-up and tabulation program are in the same order as the names printed on the ballot; and (3) the staff examine and confirm the sufficiency of these actions.

I recommend the Secretary determine an appropriate pen or marker that must be used by ES&S and voting jurisdictions, in order that a mark on one side of a ballot will not bleed through the ballot when read with the following equipment: Model 100 Precinct Count System, V. 5.0.0.0; Model 150/550 Central Count, V. 2.1.0.0Q; Model 650 Central Count, V. 1.2.0.0; the Optech Eagle Precinct Count, V. HPS 1.28, APS 1.50, CPS 1.02a, and the Optech IV-C Central Count, V. 1.06a (collectively the "Tabulation Equipment"). I also recommend the following with respect to the Tabulation Equipment: (1) the Secretary specify that the front side and the reverse of ballots to be used with the Tabulation Equipment be off-set in a manner to prevent a voter selection mark on one side of the ballot from lining up with a voter selection mark on the opposite side; and (2) the Secretary's staff examine use of the Tabulation Equipment with the approved pen or marker and off-set ballot to assure that a vote on one side of a ballot will not affect the voter's choice in a race on the other side of the ballot.

If the Secretary's staff takes these steps and determines the above listed Tabulation Equipment functions properly with the specified pens/markers and off-set ballots, I recommend the above listed Tabulation Equipment be certified by the Secretary as meeting the requirements of Chapt. 122, Subchapt. A, Texas Election Code.

Sincerely,



Barney L. Knight