

Voting System Examination Unilect Corporation

Prepared for the
Secretary of State of Texas

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Designee of the Attorney General

This report comprises the findings 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).

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| Examination Date | May 26, 2005 |
| Report Date | June 9, 2005 |

Components Examined

| Purpose | Component | Version | NASED # |
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| Voting | Patriot Precinct Control Unit (PCU) | 2.56 | Not yet approved |
| Voting | Patriot Color Voting Unit (CVU) | 2.54 | Not yet approved |
| Voting | Patriot CurbSide Model | 2.54 | Not yet approved |
| Voting | Patriot Freedom Unit (Keyboard for disabled users) | 1.0 | Not yet approved |
| Scanning | Absentee Card Reader – Model 20 | No firmware | Not yet approved |
| Election Setup & Tabulation | IntELlect Voting Software | 2.61 | Not yet approved |
| InfoPackerER | Memory Pack | 1.0 | Not yet approved |

Notes:

- The absentee card reader Model 1000 and the VVPAT until were not examined because the vendor did not have the necessary cables to demonstrate them.
- The Model 20 card reader was not examined due to lack of time. (The vendor did not have and was unable to print the voting key necessary to determine which number is associated with which candidate, which is necessary to mark the optical cards. By the time they had manually created a key, there was insufficient time to perform the test.)
- The vendor was unable to demonstrate ballot printing, because the printer they brought with them was not compatible with their system.
- Modem transfers were not demonstrated, because they could not get a dial tone. There was not time to troubleshoot the problem.

Voting

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| Election Setup | Election setup goes on the InfoPack, which plugs into the Precinct Control Unit (PCU) |
| Zero-total report | Yes. |
| Authorization to vote / Ballot selection | Poll worker authorizes voting at the Precinct Control Unit and tells the voter what booth to use, because all the stations are connected to the Precinct Control Unit. |
| View / Vote | LCD display / touch screen |
| Vote Storage | Ballot images are stored in the Precinct Control Unit, in two redundant static memories, backed up by lithium batteries. There are copies of the totals, in four redundant static memories, two in the InfoPack and two in the PCU. |
| Precinct Consolidation | Not necessary, since all votes are recorded in the Precinct Control Unit. |
| Transfer Results | Carry the InfoPacks or modem to election central, or to a consolidation site. |
| Print precinct results | Yes, on the dot-matrix printer integrated into the Precinct Control Unit |
| Straight party / crossover | Yes. Crossover votes are retained when the voter changes the straight-party vote. |
| Challenged Ballots | Yes. The poll worker indicates at the PCU that it is a challenged ballot, and the display in the PCU gives the number of the challenged ballot. |
| Protective Counter | Yes, in the Precinct Control Unit, not in the voting stations. |
| ADA | Yes. Verified by the Secretary of State. |

Election Setup / Tabulation

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| Results Storage | Flat file in proprietary format on the hard drive. |
| OS access | Not during tabulation. |
| Real-Time Audit Log | Yes. However, see below for a problem. |
| Transaction Processing | Changes to the flat file always affect only one record at a time, so any changes are always made in a single disk write. Totals are recalculated every time they are needed. |

Issues from Previous Examinations

Note: The vendor only listed the first item below on Form 100, Schedule A. The remaining items are the examiner's observations.

1. A protective counter was added to the PCU.
Result: This aspect of the system now complies with Texas law.
2. Absence of the real-time audit log printer now prevents more than one significant event from taking place. (It does not detect the absence of the printer until it tries to log an event, which

is done after the event is complete, so one event can still take place.)

Result: There are still issues with the real-time audit log printer. See below.

3. In the last examination, in 2002, I reported that “Results from a second InfoPack from the same precinct can be tallied by the operator, using the ADD command. There are legitimate reasons for counting several InfoPacks from the same precinct, but there is no legitimate reason for adding the same InfoPack. The system should record the serial number of each InfoPack that is tallied, and never permit the same InfoPack to be counted twice. (It is OK to replace the previous results from the same InfoPack, if for some reason a previous load is suspect.)”

This was not examined due to lack of time.

Recommendation: The system should not be certified until this re-examined.

4. A record of each ballot is stored in the PCU in static memories powered by two independent sets of lithium batteries. Battery power must be supplied continuously for the votes to be preserved.

Although there are two batteries in each InfoPack and two in each PCU, the vendor admits that there is no warning until the second battery fails, at which time any votes are lost. There is still redundancy, because the data is stored in both the InfoPack and the PCU. However, since the batteries are very likely the same age, it is conceivable that both would fail on the same day, thereby losing all record of the votes cast.

The vendor asserted that they have procedures for jurisdictions to check the batteries, and that they recommend doing so every election. However, they were unable to point to these procedures or this recommendation in the documentation they gave us. They asserted that it is in another version of the manual, which they forgot to bring with them. (This examiner believes such information should be in every version of the manual, since it is critical information for every user. Also, it is the vendor’s responsibility to bring all relevant material to the examination.) Although they assert the checking the batteries (which they say is done by checking the voltage) can detect an impending battery failure, nobody present was familiar with the relationship between the measured voltage and the remaining time before failure. In other words, they did not know how long the battery will last after a detectable voltage drop is present.

Furthermore, they asserted that they have replaced very few batteries, even though they have had units in the field for 10 years, the stated life of the battery. (Fortunately, none of these units is in Texas. Nevertheless, this examiner recommends that the vendor warn those users of the possibility that all their batteries are near the end of their life.)

There are more secure ways to store votes, and this method (or any method that requires continuous power) entails unnecessary risk. Furthermore the vendor has not demonstrated that they have procedures in place to deal with possible battery failures.

Recommendation: Certification should be denied until such time that votes are stored on a reliable medium that does not require power. This technology is obsolete and should not be used.

Concerns

5. The real-time audit log did not function properly. It is possible to disconnect the printer and connect another one without the system stopping. The vendor told us that events are also logged to disk, but that does not meet the Texas requirement. Furthermore, the disk log is a

text file that can easily be tampered with.

If tampering took place, the evidence of that tempering could be suppressed by swapping printers, so the log entries of the tampering go to the alternate printer. Then the paper from the alternate printer could be discarded and the printers swapped back, all without any evidence being left. The disk log could simply be edited.

Recommendation: The system should not be certified until this is fixed and re-examined.

6. The system is very difficult for precinct, central count, and warehouse workers to use. Many operations require knowledge of steps that are arcane and difficult to remember. For example:

- (a) To cancel a ballot, you press the "16" button, followed by the button for the voting station. (This examiner had trouble finding the documentation for this because it is in the Troubleshooting section, even though it is a normal Election Day procedure.)

- (b) To reconnect a voting station, you press the button labeled "Accumulate Votes" followed by the "9" button.

- (c) Errors are identified by numbers, which must be looked up in a manual.

- (d) Adding a modem to the system requires editing a hexadecimal string.

- (e) If there is a problem with the real-time log printer, the system automatically shuts down completely, and must be re-started.

This is not just a theoretical concern. Unilect admits in a letter dated, April 27, 2005, that they have lost vote records in Pennsylvania and North Carolina. In each case, they blame it on errors made by election officials, but in each case, the human errors should have been caught by the election system. In Pennsylvania, they blame a miscoded ballot and failure to follow test procedures, but the system should refuse to use a ballot if tests have been skipped. In North Carolina, they blame election officials for allowing too many ballots to be cast with a single control unit, but their control unit could have prevented the damage if it had simply stopped accepting votes, rather than continuing to allow people to vote when the votes were not being properly recorded. These examples reinforce and validate my point.

This system does not even approach the state of the art for ease of use, especially for a system used by pollworkers, who are usually infrequent users with minimal training. Note that these are just samples of problems found in a short time. There are probably many more.

Recommendation: In my professional opinion, confirmed by field experience, this system does not meet the state requirements for efficiency and ease of use. It should not be certified until this is fixed and it is re-examined.

7. Absentee voters must consult a separate list of races, determine the number of the candidate they want to vote for, and mark that number on the ballot card. Many voters will find the use of candidate numbers to be difficult and error prone.

Recommendation: The method of absentee voting should be improved before the system is certified.

8. The following were not demonstrated, due to various equipment problems, missing components, or lack of time: Model 1000 optical card reader, Model 20 optical card reader, VVPAT, ballot generation, modem transfers.

Recommendation: None of these should be certified until they are examined. Since the system cannot operate without some of them, the system should not be certified at this time.

Summary

Problems are so pervasive that this system should not be certified until it has been redesigned. The vendor should use up-to-date software usability techniques and avoid obsolete hardware technology. Finally, they should bring all the components and documentation to examinations, and verify in advance that they work.

If prior Unilect systems are certified in Texas, and they are based on the same code base and technology, decertification should be considered to protect the integrity of Texas elections.