



DEPARTMENT OF INFORMATION RESOURCES

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June 28, 2005

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Ms. Ann McGeehan
Deputy Assistant
Office of the Secretary of State
1019 Brazos Street
Austin, TX 78701

RE: Examination of Unilect voting systems

Dear Ms. McGeehan:

I attended a scheduled examination on May 26, 2005, at 8:30 am, for the purpose of examining the voting system from Unilect. The report below summarizes my findings.

Hardware/Software Version	Date Previously Certified
Patriot PCU v2.56	1/13/1999
Patriot CVU v2.54	1/13/1999
Patriot Curbside Model v2.54	1/13/1999
Patriot Freedom Unit v1.0	1/13/1999
Intellect Election Management System v2.6	1/13/1999
Absentee Card Reader Model 1000	1/13/1999
Absentee Card Reader Model 20	1/13/1999
InfoPacker v1.0	1/13/1999
InfoPack 1.0	1/13/1999

Unilect was certified in Texas six years ago. The company applied for certification with new models in 2002 but it does not seem that they were successful. The company has the oldest touchscreen system in the USA. The B/W model has been used for ten years in a few locations. None have been sold in Texas, however.

System Description

The Unilect system consists of the following components and functions:

- The Precinct Control Unit (PCU) that controls 1 to 16 voter units (CVU) at a polling location
- The Color Voter Unit (CVU) through which the voters cast ballots. Each CVU is connected to the PCU through a serial cable. Up to four CVUs can be daisy-chained together through serial ports, and the PCU can support up to four such chains for a total of 16 voter units. Voting devices do not store any record of votes. They send the record of the votes to the PCU where it is stored in internal memory (SRAM with redundant battery backup) and the Infopack, described below.

- The Patriot Curbside Model which is a CVU that is designed to be detached from the chain and taken to a voter for voting. When the unit is reattached, it transfers the data to the PCU.
- The Patriot Freedom unit that provides functions for disabled voters
- Two versions of card readers that read 20 or 1000 absentee voting cards per minute
- The Infopack that contains all the ballot styles and the cast vote records (CVR) for each PCU at a voting location. Since Infopacks are unique to a locating location, they cannot be exchanged between locations. The vendor also has a laptop-based system that can hold a practically unlimited number of ballot styles for large voting jurisdictions.
- Intellect Election Management System (EMS) software with which the election is defined, Infopacks are created, equipment is tracked, and votes are collected and tabulated at the end of an election.

System Operation

The vendor claims the central office computer is effectively locked into the Intellect EMS software so it won't run any other programs. The operating system is Windows 98 and the software uses a COTS ISAM database. Data writes are sequenced so that at most a single data set update would be lost if there were a power failure. The vendor recommends performing regular backups to guard against data loss, but backups are not automatic; the operator must perform that function manually.

The election definition is created on the central office PC in Intellect. When the election definition is complete, it is 'compiled' and locked. In the compiling process, a separate directory is created for the election database and results files. Data such as ballot styles are compressed into a special format unique to each polling location. The compressed data is then written to Infopacks, one for each PCU to be used in the election. Once the election definition has been compiled, Intellect will not read voting data from an Infopack that does not match the compiled definition.

Logic and Accuracy (L&A) tests are also created by Intellect and included in the Infopacks. The tests are designed to check for every combination of vote possible at each polling location. The vendor recommends that L&A testing be conducted in the warehouse when the Infopacks are installed in each PCU prior to an election.

When the polls are opened, the initialization process clears out all CVR data on the Infopack and automatically creates a zero totals tape. The system cannot be opened for voting with votes in the machines.

When the polls close, the system prints a precinct report, but vote totals are not stored in the Infopack. Instead, all infopacks are taken to the central count location where all the CVRs are downloaded to Intellect. Only CVRs are stored in the database. Vote totals are computed each time a report is requested.

Results of the examination

The voting test did not uncover any anomalies in counting votes, the user interface, and challenged (provisional) ballots.

The vendor could not demonstrate the large card reader because the cable was lost in shipping. They have the small card reader that reads 20 cards per minute that is used for reading absentee ballots, but it was not demonstrated at this exam.

The curbside feature appears to work as advertised. It has a well-designed review screen that is easy to read. The examiners disconnected the curbside terminal after casting a ballot, and it required about a minute to reconnect with the PCU. However, when a ballot is in progress, reconnection is almost instantaneous.

The examiners encountered the same audit log problems that were mentioned in the 2002 examination. If a printer is disconnected and another printer substituted, the system will not record that the printer was disconnected. Further, the log file is in plain text, not encrypted. Thus, someone with unauthorized access to the PC might be able to alter the log.

The vendor could not demonstrate modem transmission of data to the central count PC because the modem appeared to malfunction. They do note that modem transmission is encrypted, however. The examiners observed that the modem had to be set up manually by keying in modem commands. This may be a daunting task for non-technical users.

In addition, the vendor could not demonstrate the Ballot On Demand function because they didn't have a printer with Postscript at this examination. The Postscript requirement seems to be an odd restriction since Windows 98, the operating system for Intellect, supports TrueType (a Postscript competitor) on most printers. It appears that the system may be slightly hobbled by being tethered to its DOS heritage.

The vendor exhibit a printer intended to be attached to the PCU to provide printed audit trail for the DREs. The printout is displayed in a closed box with a Plexiglas pane between the voter and the receipt so the voter can't touch the paper. The printer paper is on a continuous roll to reduce the chance of tampering with the voting record. Unfortunately this approach creates confidentiality problems if there is only one receipt unit at a voting location because the sequence of voters may be known or easily deduced.

Recommendations

The vendor's demonstration was constrained because some of the equipment was lost in transit. Thus this examiner cannot recommend certification of the system until all components have been demonstrated as a unit.

Further, the audit log problems noted above must be addressed completely. It is also strongly recommended that the audit log be encrypted to reduce the opportunity for tampering.

Finally, it is recommended that TrueType be added as a printing alternative to reduce the dependence on more expensive and less common Postscript printers.

Respectfully,

A handwritten signature in black ink, appearing to read "Nick Osborn", with a long horizontal flourish extending to the right.

Nick Osborn
Systems Analyst