



**DÉPARTMENT OF INFORMATION RESOURCES**

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

RE: Examination of the Unity Election System Version Release 2.4.2 and vote tabulation devices from Election Systems and Software (ES&S)

Dear Ms. McGeehan:

I attended a scheduled examination January 8, 2004, at 9:30 am, for the purpose of examining the voting systems from Election Systems and Software (ES&S). The report below summarizes my findings.

**Voting Systems Versions**

**Hardware/Software Version**

**Unity Election System v2.4.2**, last certified May 2003

Unity Election System is comprised of the following subsystem modules:

Election Data Manager v7.2.1.0

IVotronic Image Manager v1.2.3.0

ES&S Image Manager v7.2.0.0

Optech Image Manager v3.2.0.0

Hardware Programming Manager v5.0.2.0

Data Acquisition Manager v5.0.3.0

Election Reporting Manager v6.4.2.0

Audit Manager v7.0.2.0

**Hardware**

Model 100 Precinct Count System v5.0.0.0

Model 650 Central Count System v1.2.0.0

Model 150/550 Central Countv2.1.0.0Q

Optech Eagle Precinct Count v HPS 1.28, APS 1.50, CPS 1.02a

**DRE voting systems**

Ivotronic DRE audio balloting system v8.0.0.0

Votronic DRE Voting System v5.19

**System description**

Unity is an umbrella marketing designation that includes all of the software modules noted above. The modules are upgraded as a single package; none of

them can be upgraded individually.

ES&S provided a list of functional changes from the prior version of Unity. Most of the changes were to peripheral functions, usually for minor bug fixes. The core functionality demonstrated in prior versions has not been changed. The new version just allows tabulated totals from "arrow" systems to be brought over to Unity. ["Arrow" systems are those in which a voter casts a vote by connecting arrows beside a candidate's name (e.g. "candidate name" => <=) with a solid line. This is in contrast to "oval" systems in which a voter casts a vote by filling in an oval on the ballot.]

ES&S explained the versioning conventions that identify all their software and firmware releases. For purposes of voting systems examinations, the relevant conventions are as follows:

- First number is reserved for a new release or a major functional revision
- Second number is reserved for minor functional revisions
- Third number is reserved for bug fixes
- Fourth number is reserved for one-off functionality, usually state specific

In addition to the new revisions of software and firmware, ES&S personnel explained the Provisional Ballot functionality in response to a query from the Texas Secretary of State.

### **System performance**

The arrow system had an interesting problem due to the way the test ballots were printed. The examiners used a "Sharpie" pen that bled through the ballots. The test election ballots were not properly designed, and the pen bled through to an arrow on the reverse side of the ballot and made it appear as though the voter had overvoted a contest on the reverse side.

The ballot was red in all four orientations and the overvote was counted on two of the orientations, indicating that the scanner was sensitive to the bleed-through only in one set of sensors.

ES&S personnel indicated that their ballot preparation software prevents such alignment, but were not used to prepare these ballots. In addition, they advise election officials to use high-solid markers rather than Sharpie-type markers to avoid this kind of problem.

Other than this self-inflicted problem, the arrow systems appeared to count votes correctly. The votes appear to import into Unity correctly, along with votes from other equipment.

The audit log functionality was not tested, however, and should be reviewed during the next examination for this vendor.

The oval systems also appeared to count votes correctly and import them into Unity correctly. It was noted that the log printer for Unity does not print the system shutdown message until the next time the system is brought up. This may lead an auditor to believe that a user's session was not terminated correctly or that the log might be missing some key data. Therefore it is recommended that the system shutdown be recorded on the real-time log before the system exits.

**Recommendations**

The Department of Information Resources (DIR) finds no technical objection to certifying the Unity Election System and firmware demonstrated at this examination.

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

MM:NO:sk