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Subject: Review of the Election System and Software (ES&S)'s Installed OpTech IV-C, Version 1.0xa, and OpTech Eagle III-P, Firmware Version APS 1.30/HPS 1.52, in San Mateo, California.

Executive Summary

Michael Wagaman, from the Secretary of State and I participated in a full Logic and Accuracy (L&A) test and review of installed software used by the precinct and central counters in San Mateo, CA. Election management support was provided by the ES&S Unity 2.2 system which was not under review.

The L&A Test scripts and ballots were inspected and sample runs conducted to validate the test deck for 552 precincts. The final full L&A test including ballots for every ballot style, in every precinct, and on every ballot scanner was to be conducted using those scripts and test decks and the final results forwarded for a final check of the results for the full L&A.

No significant problems were noted with the election definition or operation of the OpTech Eagle III-P and IV-C units for the November 2004 General Election. ES&S is checking on some program files that need verification.

References:

[SVF-1] Steve Freeman Report, *Election Systems and Software (ES&S) Instant Runoff Voting/Ranked Choice Voting Modifications for San Francisco*, 31 Mar 2004.

[SVF-2] Steve Freeman Report, *Certification of Election Systems & Software (ES&S)'s Unity 2.4.3 Election Management System (limited to AM, EDM, ESSIM, HPM, & ERM), M100 Precinct Ballot Counter (Rel 5.0.0.0), M550 Central Ballot Counter (Rel 2.1.1.0), and M650 Central Ballot Counter (Rel 1.2.0.0)*, 25 Aug 2004

Introduction

The review was not a full certification but limited to a check and test against the OpTech firmware against the previously certified Unity 2.2 for the November 2004 General Election.

This version of OpTech Eagle III-P firmware was originally modified and tested to support the San Francisco Rank Choice Voting (RCV) configuration [reference SVF report]. The configuration used in San Mateo for the November election is slightly different but allegedly uses firmware that is present in the RCV version. See more detailed comments in the Hardware Description attachment.

The OpTech IV-C is an older model that has been used in California in prior elections.

The testing with the RCV version of the OpTech Eagle was against a newer version of the Unity software than the version of Unity installed in San Mateo. This test, in part, is to confirm that this configuration works correctly for the November 2004 General Election in San Mateo county.

Review Process

The review consisted of:

- An inspection of the test ballots and test script for the L&A process.

- Verification of installed software (see comments in Attachment A).
- Validation test runs made against the test decks verifying the completeness and accuracy of the test deck on the OpTech IV-C scanners.
- Operational tests against optical scan ballot responses to various error conditions on the OpTech IV-C and for selected precincts on the OpTech Eagle III-P precinct counters.

As a final step, the county was to complete the full L & A test on all central and precinct scanners. The full L&A checks that every legal ballot position and ballot is accurately recognized and counted for all ballot scanners. The consolidated results of the L & A are to be submitted to the California Secretary of State's Election Division office for verification against the predicted results from the inspection and validation run.

Test Results

The San Mateo November General Election supports 522 precincts with 77 ballot layouts including some split precincts. For the pilot trial using the OpTech Eagle III-P, six ballot styles were selected covering 44 contests out of 62 contests and with representative contests exercising major variations between styles.

The test decks included, beside votes for standard candidates, overvotes, blank ballots, and various checks of damaged or altered ballot id codes and markings. The operational test verified that the ballot scanners would correctly recognize and respond to the ballot error conditions. All ballot variations were correctly identified and appropriate responses were prompted from the users of the precinct and central counters.

No significant problems were noted in the trial tests. The full L&A will complete the verification for all contest positions and precincts.

Security Observations

(This review did not include an examination of the full election operation. The election management system, Unity 2.2, was certified prior to the attention currently being given to security issues and its operation was not part of this review. Paper ballots have always required operational and physical security and no special attempt was made to review other security for this system.)

San Mateo has instituted additional physical security, isolating the operations in a separate Local Area Network with procedural controls to limit the introduction of software changes or alterations including video cameras and restricted access.

Conclusion

No significant problems were noted with the election definition or operation of the OpTech Eagle III-P and IV-C units for the November 2004 General Election. ES&S is checking on some program files that need verification.

Sincerely,



Steven V. Freeman

One Attachment:

- A. Hardware Description with a list of the test configuration components.

Attachment A.

Hardware Descriptions

The Eagle III-P Precinct Ballot Counter.

The Eagle is an optical scan precinct ballot counter which has a prior history of use in California. The specific test configuration under review is a variation of the configuration used for the San Francisco Rank Choice Voting (RCV). This configuration is more consistent with the standard models of OpTech Eagle III-P using some of the same firmware used in the RCV model.

(Note: full specification of the chipset was not provided for this review. The following information was obtained from version information produced by status reports).

The following chart shows the configuration differences

OpTech Eagle Model III-P

San Mateo

APS EEPROM, 1.52

HPS EEPROM, 1.30

RCV

IDA Board with PIC Micro Controller, Firmware Version RCV 74r1

HPS EEPROM 1.30

ES&S Memory Packs

APS EEPROM 1.52

APS EEPROM 1.52

Election Management System-Unity 2.2