

Elections Systems and Software (ES&S)

**Rank Choice Voting System for the
City and County of San Francisco**

Election Data Management (EDM) 7.2.1.3 (RCV mod.)
Hardware Program Manager (HPM) 5.0.3.2 (RCV mod.)
Election Reporting Manager (ERM) 6.4.3.2b (RCV mod.)
Audit Manager 7.0.2.0
Optech Image Manager 3.2.0.0
Data Acquisition Manager (DAM) 5.0.3.0
Optech IV-C M400 1.08c (RCV mod.)
Optech IIP Eagle HPS1.30/APS1.52/BIT 1.10 (RCV mod.)
AutoMARK Voter Assist Terminal (VAT) 1.0
AIMS 1.09

Staff Review and Analysis

Prepared by:
Secretary of State Office of
Voting Systems Technology Assessment

OCTOBER 11, 2006

Table of Contents

I. SUMMARY OF THE APPLICATION 3

II. SUMMARY OF THE SYSTEM 3

III. TESTING INFORMATION AND RESULTS 6

**IV. COMPLIANCE WITH STATE AND FEDERAL LAWS AND
REGULATIONS 9**

V. RECOMMENDATION 16

I. SUMMARY OF THE APPLICATION

Election Systems & Software's (ES&S) system for rank choice voting (RCV) was first conditionally approved by the Secretary of State for use in San Francisco's elections on April 30, 2004. That conditional certification permitted San Francisco to use the ES&S RCV system on a one-time basis for the November 2004 General Election. After receiving reports on the system's performance in that election at a public hearing on February 17, 2005 the Secretary of State conditionally recertified the system for use on March 7, 2005 until December 31, 2005 only in the City and County of San Francisco.

On August 3, 2006 the Secretary of State received an application from ES&S requesting a one-time, final approval of the their RCV system, modified to meet the accessibility requirements of the Help America Vote Act (HAVA) for use in the November 2006 General Election. The proposed system, including the procedures, hardware, firmware and software developed by ES&S for conducting a San Francisco RCV election is comprised of the following components: Election Data Management (EDM) version 7.2.1.3 (RCV mod.), Hardware Program Manager (HPM) version 5.0.3.2 (RCV mod.), Election Reporting Manager (ERM) version 6.4.3.2b (RCV mod.), Audit Manager version 7.0.2.0, Optech Image Manager version 3.2.0.0, Data Acquisition Manager (DAM) 5.0.3.0, Optech IV-C Model 400 version 1.08c (RCV mod.), Optech III-P Eagle version HPS1.30 (RCV mod.)/APS1.52 (RCV mod.)/BIT 1.10 (RCV mod.), AutoMARK Voter Assist Terminal (VAT) version 1.0 and AutoMARK Information Management System (AIMS) version 1.09.

II. SUMMARY OF THE SYSTEM

The RCV process uses normal ES&S Optech ballots with two additional contests added to each race which qualifies as a RCV race to indicate the 2nd and 3rd rank choices. The Optech IV-C and Optech Eagle ballot scanners have been modified to count and report the first choice as a normal race but to store and forward the rank choice votes for all three ranked choices for each RCV race. For the Eagle precinct counter, the RCV modified models are to return ballots with over votes or under votes in the 2nd and 3rd choice contest for correction to voters to change or accept. The actual calculation of the final outcome is run as separate calculation within Unity's Election Reporting Manager (ERM) module after standard reporting indicates that an RCV race has no candidate with 50 percent + 1 vote.

1. Optech III-P Eagle version HPS1.30 (RCV mod.)/APS1.52 (RCV mod.)/BIT 1.10 (RCV mod.),

The Optech III-P Eagle is a scanner and vote tabulator used only at the precinct level. This device contains software capable of reading, interpreting and summarizing information captured from each ballot, however the tabulation and reports are used only to balance at a precinct level and are not used for official reporting purposes. The Optech III-P Eagle contains features that warn voters when they have under voted a contest, or in the case of the RCV process, when a candidate is selected in more than one choice. However, ballots

containing one or more write-ins are not tabulated and are automatically sorted and stored in a separate compartment within the ballot box for later validation and tabulation either manually or through the Optech IV-C Model 400 device.

This RCV version of the Optech III-P Eagle, as modified for RCV, was last certified on March 7, 2005 with an expiration of December 31, 2005, and is presented in this application with no changes.

2. Optech IV-C Model 400 version 1.08c (RCV mod.)

The Optech IV-C is a high-speed ballot processing device that process up to 400 ballots per minute. The Optech IV-C is used as the main ballot tabulation system at the central count processing center for absentee and provisional ballot-processing. The IV-C captures the ballot images in a similar manner as the Eagle, but can also process the ballots with write-in candidates not processed by the Eagle. The Optech IV-C will out stack mis-reads, write-ins and over-votes without stopping the count.

The Optech IV-C as modified for RCV was last certified on March 7, 2005 with an expiration of December 31, 2005, and is presented in this application with no changes.

3. AutoMARK Voter Assist Terminal (VAT) version 1.0

The AutoMARK VAT is a new device that marks ES&S optical scan ballots. It was primarily designed to assist those who are visually impaired, physically disabled, or prefer to vote in an alternate language, allowing them to vote privately and independently

A voter using this device simply inserts his or her blank ballot. The VAT then scans the ballot to determine the correct ballot style configuration and displays the ballot through a series of screens on a touch-screen monitor (similar to DRE voting devices). The VAT is capable of being programmed to provide instruction and display the ballot in multiple languages. The AutoMARK VAT supports visually impaired voters through audio instruction and a Braille coded keypad. In this mode, the screen can be blanked to insure voter privacy. This audio mode also supports multiple languages. Finally, physically impaired voters can vote on the AutoMARK using a foot-pedal or by connecting their own sip-puff device.

If a marked ballot is inserted into the VAT, it will display the marked vote choices on the screen for verification and will also provide that verification through the audio mode.

The AutoMARK VAT does not store, count or tabulate voted ballots. It can only be used to mark optical scan ballots for tabulation by another device or to confirm the vote choices on a voted ballot.

This version of the AutoMARK was originally certified for general use with the ES&S Models 100, 550 and 650 in California on August 3, 2005 and is now included as part of this application unchanged from that previous certification. Because the AutoMARK has not been certified to work with ballots that are compatible with the Optech Eagle and Optech IV-C, the vendor has proposed in their Use Procedures that voters using the AutoMARK will actually vote on the newer AutoMARK compatible ES&S ballots. These ballots will then be

sealed in an envelope for confidentiality and, during the official canvass, will be duplicated onto Eagle-compatible Optech ballots and tabulated in accordance with California law.

To accommodate San Francisco's Cantonese-speaking community, which the AutoMARK does not natively support, ES&S has also proposed and demonstrated procedures to program the AutoMARK for Cantonese through modification of the language files of an alternate supported language. These procedures require the substitution of bit-mapped images containing commands in the Chinese character set for the existing images in the alternate language being replaced. Further, the Cantonese audio instructions and ballot information are recorded into various wave files and uploaded into the alternate language space in accordance with existing AutoMARK procedures.

4. UNITY Election Management System Software

The UNITY software is an election management system used to define and configure elections, program all system devices and then tabulate and report vote results. It is composed of the following modules:

Election Data Management (EDM) version 7.2.1.3 (RCV mod.)

The Election Data Management (EDM) is the database used by Unity to store all information used for defining an election, including precinct, contest and candidate information. Once election data is entered into EDM, the information can be recalled and edited for any future election.

Hardware Program Manager (HPM) version 5.0.3.2 (RCV mod.)

The Hardware Program Manager (HPM) is used to convert the election file to create election definitions and burn the various media used to program the IV-Cs and the Eagles. It can also be used for coding the election definition and can be used as a complete election package within Unity.

Election Reporting Manager (ERM) version 6.4.3.2b (RCV mod.),

The Election Reporting Manager (ERM) is the system component that receives, compiles and reports the vote results. The RCV algorithm for calculating the RCV vote results resides within ERM. Reports generated by ERM can be printed on paper, displayed on a monitor or stored electronically.

Data Acquisition Manager Data Acquisition Manager (DAM) 5.0.3.0

The Acquisition Manager (DAM) software allows the capture of the election results from precinct tabulation devices at remote sites and then relays those results to ERM at the jurisdiction's central facility.

Audit Manager version 7.0.2.0

The Audit Manager provides the security for the Unity system, including a real-time audit log of all user inputs and system outputs.

Optech Image Manager version 3.2.0.0

The Optech Image Manager (OPTECHIM) is used to create the actual ballot layout images for the ballots used by the Optech Eagle and IV-C tabulators.

The first three Unity components above have been specially modified to support the RCV system. All the above components of Unity were last certified on March 7, 2005 with an expiration of December 31, 2005, and are presented in this application with no changes.

5. AutoMARK Information Management System (AIMS) version 1.09

The AutoMARK Information Management System (AIMS) is PC compatible software that is used to program the configuration of AutoMARK VATs. Initially election setup is performed in AIMS through import of Unity configuration files or direct input into AIMS. Written and audio translations can then be added to the ballot configurations. Finally, the appropriate configuration is recorded onto compact flash memory cards for insertion into AutoMARK VATs to configure the VATs for their appropriate precincts and ballot styles.

This version of AIMS was originally certified for general use in California on August 3, 2005 and is now included as part of this RCV application, unchanged from that previous certification.

III. Testing Information and Results

1. Federal Testing

Both the Optech IV-C and the Optech Eagle were first approved for use in California by the Secretary of State on March 13, 1991. That approval predates the federal voting system standards and the National Association of State Election Directors' (NASSED) federal qualification program. Various versions of both the Optech IV-C and the Optech Eagle have since received federal qualification.

The RCV hardware modifications to the Optech Eagle circuit board were submitted to Wyle Laboratories and basic environmental testing was performed, but no software review nor functional testing were performed on the specific hardware and firmware changes.

Unity version 2.4.2, which is the baseline for the RCV modifications, received NASSED federal qualification on February 19, 2004 with NASSED Qualification Number N-1-02-12-11-001. (This version of Unity was never submitted for California certification, although subsequent versions of Unity have since been approved.) This version of Unity included some support for RCV but required additional modifications to perform RCV processing.

The modifications to Unity 2.4.2 were submitted to Ciber, Inc. for review and testing under the VSS standards. The functional system testing was done in conjunction with the original state certification testing performed in 2004. Software Source Code review and other ITA review tasks were done based on the VSS 1990 standards and a report was prepared. That testing did not result in a NASSED qualification.

2. State Testing by the Secretary of State and Consultant.

Secretary of State testing of the system was initially conducted at the ES&S offices in Omaha, Nebraska from August 28, 2006 through September 1, 2006 by Secretary of State staff in conjunction with the state's technical consultants, Mr. Steve Freeman and Mr. Paul

Craft. At the conclusion of that testing there were unexpected anomalies in two contests where the RCV algorithm failed to correctly resolve the contest.

It was subsequently determined that testing had not been done with the final RCV version of ERM that was actually used by San Francisco, version 6.4.3.2b. Instead, that testing had been conducted with version 6.4.3.2. ES&S also later determined that the anomalies could also have been caused in the way election data was saved and copied prior to running the RCV algorithm.

Retesting of the proposed RCV system (including the correct version of ERM) was performed at the City and County of San Francisco offices in City Hall, San Francisco, on September 25 and 26, 2006, by the state's technical consultant, Mr. Steve Freeman, in conjunction with Secretary of State staff. During the San Francisco testing, tests were conducted using the pre-defined test election definition, as well as with the election definition and actual ballots for the RCV contests in the upcoming San Francisco November 2006 General Election. The issues identified in that testing are detailed below.

A volume test was not conducted on this system since the application is for one-time approval for use in the upcoming November 2006 General Election and the system components had all been used successfully in two prior elections.

General Testing Results

Testing of the ES&S RCV system was completed successfully. In both tests performed, installation of the trusted software build was verified and sufficient ballots were processed to test the San Francisco standard rank choice voting process as well as to test the system's capability to conduct elections in accordance with California Law. Other than as noted below, the RCV algorithm function as expected and all results were verified by applying the algorithm manually.

The following were issues that were encountered during the testing process.

- During the initial testing in Omaha, several of the test ballots were not properly read by the Optech III-P Eagle. Although the machine was cleaned twice and re-calibrated, it kept giving the same results with the same ballots. While the ballots had been marked using the pen supplied by ES&S for that purpose, it was finally determined that these were the wrong pens for use with the wrong ink for the Optech Eagle to properly read. (The pens used were pens recommended by ES&S for the Optech IV-C M400). Once, the ballots were remarked with recommended pen, the Eagle was able to correctly read the ballots from that point on. This incident served to underscore the essential vulnerability of the older Eagle tabulator when ballots are marked with a non-approved pen, as any voter might do in the polling place, despite instructions to the contrary.
- The summary statistics on the results tape printed by the Eagle breaks down the total ballot count into "Regular" and "Overvoted" ballot counts. In the test conducted, the count of "Overvoted" ballots on the tape did not correctly reflect the number of ballots that had one or more over-voted contests. Upon further investigation, the vendor determined that the machine counter for "overvoted" ballots was actually counting the number of ballots for which the override key had been pushed to accept the ballot. In addition to over-voted ballots, this included ballots that were under

voted, and where a voter selected the same candidate in more than one choice for the same race. The over-voted category is deceiving because it is actually the count of every ballot that was over written and not necessarily over-voted.

- The printed vote-results summary printed by the Eagle and the IV-C only contain the results for the “First Choice” contest in each RCV race. The votes for the second-choice and third-choice contests in each RCV race are actually captured and stored as ballot “images” on the memory media for each device, for later import into ERM. The votes for these second- and third-choice contests can actually be read and proofed with the Precinct Detail Report in ERM. However, the RCV protocol specifies that if a voter over-votes a contest, either first-, second- or third-choice, that contest is thrown out and all subsequent choices for that race considered under-voted. Similarly, if a voter votes for a candidate in the first- or second-choice contest and then votes for the same candidate in a later choice contest in the same RCV race, the later choice for the candidate is seen by the system as an under-vote. Counter-intuitively, the Precinct Detail Report showing the vote results for RCV contests reflects these instances as under-votes, rather than how the ballot was actually marked. San Francisco elections staff and other users’ of this report need to be aware of this fundamental report interpretation.
- The RCV rules and the algorithm stipulate that in situations where the sum of votes for the lowest two or more candidates is less than the votes credited to the next highest candidate, all those lowest candidates shall be simultaneously eliminated. In the instance where two or more candidates are tied with the lowest number of votes and the sum of their votes is greater than the next highest candidate, one of those candidates shall be selected for elimination using a coin toss. If the sum of the lowest candidates is less than the next highest candidate, than all should be simultaneously eliminated in accordance with the first rule. Generally, the algorithm was found to work this way in testing. However, it was discovered that algorithm breaks down in the rare situation where the sum of votes for the lowest candidates exactly equaled the results for the next highest candidates who were also tied. For example:

Candidate A	120 votes
Candidate B	87 votes
Candidate C	60 votes
Candidate D	60 votes
Candidate E	30 votes
Candidate F	30 votes

In the example above, the algorithm should simultaneously eliminate both candidates E and F. Instead, the process stops and forces the user to select only one of the candidates for elimination. Once selected, the algorithm continues to process normally, as expected. Because of this anomaly, the jurisdiction should publish clear procedures prior to the election for how the anomaly will be handled should this rare event actually occur in the election.

- The components of this RCV system can only have one counter for write-ins in each contest. Generally, all write-in votes for non-certified write-in candidates are attributed to that counter or “bucket”. However, if there is one certified write-in candidate, then that contest’s counter can be ‘assigned’ to the certified write-in candidate and tabulated through the IV-C normally. In situations where there are two or more certified write-in candidates within the same contest, only ballots with votes for the candidate defined to the write-in counter can be tabulated automatically through the IV-C. All other ballots must be entered individually by hand into ERM. Contests for which voters wrote-in a non-certified name are posted as under-voted.
- During the testing in San Francisco, two Eagle units actually failed during the test and were pulled from the test. The first unit failed because it was not able to communicate with the card containing the election definition. The second unit failed after processing many ballots, when it spontaneously started rebooting itself. An additional Eagle was brought in to replace this second failed unit. The remaining two Eagles function properly through out the remaining of the test.

IV. COMPLIANCE WITH STATE AND FEDERAL LAWS AND REGULATIONS

A review of the appropriate Elections Code sections was conducted.

§15360. During the official canvass of every election in which a voting system is used, the official conducting the election shall conduct a public manual tally of the ballots tabulated by those devices cast in 1 percent of the precincts chosen at random by the elections official. If 1 percent of the precincts should be less than one whole precinct, the tally shall be conducted in one precinct chosen at random by the elections official.

In addition to the 1 percent count, the elections official shall, for each race not included in the initial group of precincts, count one additional precinct. The manual tally shall apply only to the race not previously counted.

The City and County of San Francisco have instituted a process for performing the 1% manual audit in accordance with the Elections Code. This process was used in both of the previous RCV elections.

§19300 permit the voter to vote for all the candidates of one party or in part for the candidates of one party and in part for the candidates of one or more other parties.

The system supports this requirement.

§19301. A voting machine shall provide in the general election for grouping under the name of the office to be voted on, all the candidates for the office with the designation of the parties, if any, by which they were respectively nominated.

The designation may be by usual or reasonable abbreviation of party names.

The system meets this requirement.

§19302. The labels on voting machines and the way in which candidates' names are grouped shall conform as nearly as possible to the form of ballot provided for in elections where voting machines are not used.

The system meets this requirement.

§19303. If the voting machine is so constructed that a voter can cast a vote in part for presidential electors of one party and in part for those of one or more other parties or those not nominated by any party, it may also be provided with: (a) one device for each party for voting for all the presidential electors of that party by one operation, (b) a ballot label therefore containing only the words "presidential electors" preceded by the name of the party and followed by the names of its candidates for the offices of President and Vice President, and (c) a registering device therefore which shall register the vote cast for the electors when thus voted collectively.

If a voting machine is so constructed that a voter can cast a vote in part for delegates to a national party convention of one party and in part for those of one or more other parties or those not nominated by any party, it may be provided with one device for each party for voting by one operation for each group of candidates to national conventions that may be voted for as a group according to the law governing presidential primaries.

No straight party voting device shall be used except for delegates to a national convention or for presidential electors.

The system complies with these requirements.

§19304. A write-in ballot shall be cast in its appropriate place on the machine, or it shall be void and not counted.

The system complies with this requirement.

§19320. Before preparing a voting machine for any general election, the elections official shall mail written notice to the chairperson of the county central committee of at least two of the principal political parties, stating the time and place where machines will be prepared. At the specified time, one representative of each of the political parties shall be afforded an opportunity to see that the machines are in proper condition for use in the election.

The party representatives shall be sworn to perform faithfully their duties but shall not interfere with the officials or assume any of their duties. When a machine has been so examined by the representatives, it shall be sealed with a numbered metal seal. The representatives shall certify to the number of the machines, whether all of the counters are set at zero (000), and the number registered on the protective counter and on the seal.

The system supports this requirement.

§19321. The elections official shall affix ballot labels to the machines to correspond with the sample ballot for the election. He or she shall employ competent persons to assist him or her in affixing the labels and in putting the machines in order. Each machine shall be tested to ascertain whether it is operating properly.

The system supports this requirement.

§19322. When a voting machine has been properly prepared for an election, it shall be locked against voting and sealed. After that initial preparation, a member of the precinct board or some duly authorized person, other than the one preparing the machines, shall inspect each machine and submit a written report. The report shall note the following: (1) Whether all of the registering counters are set at zero (000), (2) whether the machine is arranged in all respects in good order for the election, (3) whether the machine is locked, (4) the number on the protective counter, (5) the number on the seal. The keys shall be delivered to the election board together with a copy of the written report, made on the proper blanks, stating that the machine is in every way properly prepared for the election.

The system supports this requirement.

§19340. Any member of a precinct board who has not previously attended a training class in the use of the voting machines and the duties of a board member shall be required to do so, unless appointed to fill an emergency vacancy.

The system does not affect this requirement.

§19341. The precinct board shall consist of one inspector and two judges who shall be appointed and compensated pursuant to the general election laws. One additional inspector or judge shall be appointed for each additional voting machine used in the polling place.

The system does not affect this requirement.

§19360. Before unsealing the envelope containing the keys and opening the doors concealing the counters the precinct board shall determine that the number on the seal on the machine and the number registered on the protective counter correspond to the numbers on the envelope.

Each member of the precinct board shall then carefully examine the counters to see that each registers zero (000). If the machine is provided with embossing, printing, or photography devices that record the readings of the counters the board shall, instead of opening the counter compartment, cause a “before election proof sheet” to be produced and determined by it that all counters register zero (000).

If any discrepancy is found in the numbers registered on the counters or the “before election proof sheet” the precinct board shall make, sign, and post a written statement attesting to this fact. In filling out the statement of return of votes cast, the precinct board shall subtract any number shown on the counter from the number shown on the counter at the close of the polls.

The system supports this requirement.

§19361. The keys to the voting machines shall be delivered to the precinct board no later than 12 hours before the opening of the polls. They shall be in an envelope upon which is written the designation and location of the election precinct, the number of the voting machine, the number on the seal, and the number registered on the protective counter. The precinct board member receiving the key shall sign a receipt.

The envelope shall not be opened until at least two members of the precinct board are present to determine that the envelope has not been opened.

At the close of the polls the keys shall be placed in the envelope supplied by the official and the number of the machine, the number written on the envelope.

The system does not affect this requirement.

§19362. The exterior of the voting machine and every part of the polling place shall be in plain view of the election precinct board and the poll watchers.

Each machine shall be at least four feet from the poll clerk’s table.

The system does not affect this requirement.

§19363. Voters shall not remain in or occupy the booths or compartments longer than is necessary to mark their ballots, which shall not exceed five minutes. However, where no other voter would be inconvenienced, a longer period shall be allowed.

The system does not affect this requirement.

§19370. As soon as the polls are closed, the precinct board, in the presence of the watchers and all others lawfully present, shall immediately lock the voting machine against voting and open the counting compartments, giving full view of all counter numbers. A board member shall in the order of the offices as their titles are arranged

on the machine, read and distinctly announce the name or designating number and letter on each counter for each candidate's name and the result as shown by the counter numbers. He or she shall also in the same manner announce the vote on each measure.

If the machine is provided with a recording device, in lieu of opening the counter compartment the precinct board shall proceed to operate the mechanism to produce the statement of return of votes cast record in a minimum of three copies, remove the irregular ballot, if any, record on the statement of return of votes cast record. The irregular ballot shall, be attached to the statement of result record of votes cast for the machine and become a part thereof. One copy of the statement of return of votes cast for each machine shall be posted upon the outside wall of the precinct for all to see. The statement of return of votes cast for each machine for the precinct shall constitute the precinct statement of result of votes cast.

The system supports this requirement.

§19371. Before adjourning, the precinct board shall seal the operating lever with the seal provided and lock the machine so that the voting and counting mechanism may not be operated.

It shall remain locked and sealed against operation until the time for filing a contest of election has expired, which shall not exceed a period of 30 days following the declaration of the result of the election by the body canvassing the returns.

Does not apply.

§19380. During the reading of the result of votes cast, any candidate or watcher who may desire to be present shall be admitted to the polling place. The proclamation of the result of the votes cast shall be distinctly announced by the precinct board who shall read the name of each candidate, or the designating number and letter of his or her counter, and the vote registered on the counter. The board shall also read the vote cast for and against each measure submitted. The board shall not count votes cast for write-in candidates, but shall have these counted by the elections official. During the proclamation, many opportunities shall be given to any person lawfully present to compare the result so announced with the counter dials of the machine, and any necessary corrections shall immediately be made by the precinct board, after which the doors of the voting machine shall be closed and locked.

If the machine is provided with a recording device, the alternate procedures in Section 19370 may be used.

Does not apply

§19381. In each election district where voting machines are used, statements of the results of the vote cast shall be printed to conform with the type of voting machine used.

The designating number and letter on the counter for each candidate shall be printed next to the candidate's name on the statements of result of the vote cast. Two such statements shall be used in each election district.

The system meets this requirement.

§19382. The statement of the result of votes cast, which shall be certified by the precinct board, shall contain:

- (a) The total number of votes cast.**
- (b) The number of votes cast for each candidate and measure as shown on the counter.**
- (c) The number of votes for persons not nominated.**
- (d) Printed directions to the precinct board for their guidance before the polls are opened and when the polls are closed.**
- (e) A certificate, which shall be signed by the election officers before the polls are opened, showing:
 - (1) The delivery of the keys in a sealed envelope.**
 - (2) The number on the seal.**
 - (3) The number registered on the protective counter.**
 - (4) Whether all of the counters are set at zero (000).**
 - (5) Whether the public counter is set at zero (000).**
 - (6) Whether the ballot labels are properly placed in the machine.****
- (f) A certificate that shall be filled out after the polls have been closed, showing:
 - (1) That the machine has been locked against voting and sealed.**
 - (2) The number of voters as shown on the public counter.**
 - (3) The number on the seal.**
 - (4) The number registered on the protective counter.**
 - (5) That the voting machine is closed and locked.****

The proposed system will utilize the Optech Eagle devices, which will be used at the precincts to tabulate the 1st choice votes as well as the votes for non-RCV races. The Eagles will provide precinct level results for all 1st choice candidates and non-RCV races. The Eagle will not provide vote totals for 2nd and 3rd choice candidates.

§19383. A member of the precinct board shall enter the vote, as registered, on the statements of result of votes cast, in the same order on the space that has the same name or designating number and letter, after which another member shall verify the figures by calling them off in the same manner from the counters of the machine. The counter compartment of the voting machine shall remain open until the official returns and all other reports have been fully completed and verified by the precinct board.

If the machine is provided with a recording device, the alternate procedures in Section 19370 may be used.

Does not apply.

§19384. The precinct board shall, before it adjourns, post conspicuously on the outside of the polling place a copy of the result of the votes cast at the polling place. The copy of the result shall be signed by the members of the precinct board.

If the machine is provided with a recording device, the statement of result of vote's cast produced by operating its mechanism may be considered the "result of the votes cast" at the polling place.

The proposed system will utilize the Optech Eagle devices, which will be used at the precincts to tabulate the 1st choice votes as well as the votes for non-RCV races. The Eagles will provide precinct level results for all 1st choice candidates and non-RCV races. While the memory cards will include the vote totals for 2nd and 3rd choice candidates, these contests will not be reflected on the Eagle's printed results tape.

§19385. The precinct board shall immediately transmit unsealed to the elections official a copy of the result of the votes cast at the polling place, the copy shall be signed by the members of the precinct board, and shall be open to public inspection.

The proposed system will utilize the Optech Eagle devices, which will be used at the precincts to tabulate the 1st choice votes as well as the votes for non-RCV races. The Eagles will provide precinct level results for all 1st choice candidates and non-RCV races. While the memory cards will include the vote totals for 2nd and 3rd choice candidates, these contests will not be reflected on the Eagle's printed results tape.

§19386. Before proceeding to canvass the returns of an election at which voting machines have been used to register the votes cast, the board authorized to canvass returns shall open the counter compartment and compare the records of votes cast for the several candidates voted for and for and against the several measures voted upon shown on each machine with those recorded on the statement of results of votes cast prepared from that machine by the precinct board. Any errors found on the statement shall be corrected by crossing out the recorded incorrect number, and recording the correct number nearby.

The proposed system will utilize the Optech Eagle devices, which will be used at the precincts to tabulate the 1st choice votes as well as the votes for non-RCV races. The Eagles will provide precinct level results for all 1st choice candidates and non-RCV races. While the memory cards will include the vote totals for 2nd and 3rd choice candidates, these contests will not be reflected on the Eagle's printed results tape.

The Voting Rights Act of 1965, as amended (42 U.S.C. 1973), requires all elections in certain covered jurisdictions to provide registration and voting materials and oral assistance in the language of a qualified language minority group in addition to English. Currently in California, there are six VRA languages (Spanish, Chinese, Japanese, Vietnamese, Korean and Tagalog) as prescribed under the law.

Information can be printed in additional languages as needed on the ballot.

The National Voter Registration Act of 1993 (42 U.S.C. 1973gg and 11 CFR 8) allows for the casting of provisional ballots through Fail-Safe Voting procedures.

The system allows for the issuing of fail-safe or provisional ballots through the use of specially marked envelopes. The envelopes basically indicate that the voter is a fail-safe or provisional voter. Provisional voter ballots are in substantially the same form of absent voter ballots. If, during the canvass, the voter is deemed to have eligibility to vote in an election, the vote totals can be integrated with the rest of the results.

The Voting Accessibility for the Elderly and Handicapped Act of 1984 (42 U.S.C. 1973ee through 1973ee-6) requires each political subdivision conducting elections within each state to assure that all polling places for federal elections are accessible to elderly and handicapped voters, except in the case of an emergency as determined by the state's chief election officer or unless the state's chief election officer: (1) determines, by surveying all potential polling places, that no such place in the area is accessible or can be made temporarily accessible, and (2) assures that any handicapped voter assigned to an inaccessible polling place will, upon advance request under established state procedures, either be assigned to an accessible polling place or be provided an alternative means of casting a ballot on election day.

The system is more accessible than the RCV system previously used with the addition of the AutoMARK VAC, a ballot marking device aimed specifically at voters with disabilities and voters with alternative language needs.

The Retention of Voting Documentation (42 U.S.C. 1974 through 1974e) statute applies in all jurisdictions and to all elections in which a federal candidate is on a ballot. It requires elections officials to preserve for 22 months all records and papers which came into their possession relating to an application, registration, payment of a poll tax, or other act requisite to voting. Note: The US Department of Justice considers this law to cover all voter registration records, all poll lists and similar documents reflecting the identity of voters casting ballots at the polls, all applications for absentee ballots, all envelopes in which absentee ballots are returned for tabulation, all documents containing oaths of voters, all documents relating to challenges to voters or absentee ballots, all tally sheets and canvass reports, all records reflecting the appointment of persons entitled to act as poll officials or poll watchers, and all computer programs used to tabulate votes electronically. In addition, it is the Department of Justice's view that the phrase "other act requisite to voting" requires the retention of the ballots themselves, at least in those jurisdictions where a voter's electoral preference is manifested by marking a piece of paper or by punching holes in a computer card.

The system allows for the retention of the actual ballots.

V. RECOMMENDATION

Staff recommends certification of this system with the following provisions:

- A. This system is approved on a final, one-time only basis for use in the upcoming November 2006 General Election by the City and County of San Francisco.
- B. The AutoMARK must be used in accordance with the vendor's proposed procedures for accommodation of the Cantonese language.
- C. No additional software developed by the Vendor other than that specifically listed in this certificate shall be installed on a computer running any component of this RCV system;
- D. No substitution or modification of the voting systems shall be made with respect to any component of the voting systems, including the Procedures, until the Secretary of State has been notified in writing and has determined that the proposed change or modification does not impair the accuracy and efficiency of the voting systems sufficient to require a re-examination and approval;
- E. The Secretary of State reserves the right, with reasonable notice to Vendor and to the counties using any of the voting systems, to modify the Procedures used with any of the voting systems and to impose additional requirements with respect to the use of any of the systems if the Secretary of State determines that such modifications or additions are necessary to enhance the accuracy, reliability or security of any of the voting systems. Such modifications or additions shall be deemed to be incorporated herein as if set forth in full;
- F. Any county using this voting system shall, prior to such use, file with the California Secretary of State a copy of its Election Observer Panel plan;
- G. The vendor agrees in writing to provide, and shall provide, to the Secretary of State, or to the Secretary of State's designee, within 30 (thirty) days of the Secretary of State's demand for such, a working version of the voting system, including all hardware, firmware and software of the voting system, as well as the source code for any software or firmware contained in the voting system, including any commercial off the shelf software or firmware that is available and disclosable by the vendor, provided that the Secretary of State first commits to the vendor in writing to maintain the confidentiality of the contents of such voting system or source code so as to protect the proprietary interests of the vendor in such voting system or source code. The terms of the commitment to maintain confidentiality shall be determined solely by the Secretary of State, after consultation with the vendor. The voting system shall not be installed in any California jurisdiction until the vendor has signed such an agreement. Any reasonable costs associated with the review of the source code for any software or firmware contained in the voting system shall be born by the vendor;
- H. A final version of use procedures must be submitted to and approved by the Secretary of State prior to sale or use of the system in California.

- I. The county elections official must submit to the Secretary of State a plan for voter and poll worker education no later than 30 days prior to the election in which the system will be used. Training shall be conducted for all personnel, including poll workers, on the appropriate elements, including security procedures, that are detailed in the Secretary of State approved Use Procedures for this system.
- J. The Secretary of State reserves the right to monitor activities before, during and after the election at any precinct or registrar of voters' office, and may, at his or her discretion, conduct a random parallel monitoring test of voting equipment.
- K. Pursuant to this application and by order of the Secretary of State, voting systems certified for use in California shall comply with all applicable state and federal requirements, including, but not limited to, those voting system requirements as set forth in the California Elections Code and the Help America Vote Act of 2002 and those requirements incorporated by reference in the Help America Vote Act of 2002. Further, voting systems shall also comply with all state and federal voting system guidelines, standards, regulations and requirements that derive authority from or are promulgated pursuant to and in furtherance of California Elections Code and the Help America Vote Act of 2002 or other applicable state or federal law when appropriate.
- L. Voting system manufacturers or their agents shall assume full responsibility for any representation that a voting system complies with all applicable state and federal requirements, including, but not limited to, those voting system requirements as set forth in the California Elections Code and the Help America Vote Act of 2002 and those requirements incorporated by reference in the Help America Vote Act of 2002. In the event such representation is determined to be false or misleading, voting system manufacturers or their agents shall be responsible for the cost of any upgrade, retrofit or replacement of any voting system or its component parts found to be necessary for certification or otherwise not in compliance.
- M. Any voting system purchased with funds allocated by the Secretary of State's office shall meet all applicable state and federal standards, regulations and requirements, including, but not limited to, those voting system requirements as set forth in the California Elections Code and the Help America Vote Act of 2002 and those requirements incorporated by reference in the Help America Vote Act of 2002.
- N. The vendor must establish a California County User Group and hold at least one annual meeting where all California users and Secretary of State staff are invited to attend and review the system and ensure voter accessibility.
- O. In addition to depositing the source code in an approved escrow facility, the vendor must deposit a copy of the system source code and binary executables with the Secretary of State. The Secretary of State reserves the right to perform a full independent review of the source code.

- P. The vendor must provide printing specifications for paper ballots to the Secretary of State. The Secretary of State will certify printers to print ballots for this system based upon their demonstrated ability to do so. The vendor may not require exclusivity in ballot printing and must cooperate fully in certification testing of ballots produced by other ballot printers.