King County Elections

Protecting Elections in King County

In the summer of 2006, the Brennan Center *(New York University Law School)* released an analysis of the security vulnerabilities in direct recording electronic (with and without a voter verified paper audit trail) and precinct count optical scan voting equipment. King County uses precinct count optical scan equipment to tabulate paper ballots at the polls and direct recording electronic equipment to provide accessibility to individuals with disabilities. The following six security recommendations were made in the Brennan Center report, "The Machinery of Democracy: Protecting Elections in an Electronic World," and are followed by King County Elections' response and action taken in an effort to ensure open, transparent and accurate elections.

Read the report online at http://www.brennancenter.org/.

Brennan Center Recommendation #1
Conduct automatic routine audit of paper records.
Washington State law requires every accessible voting machine contain a voter verified paper audit trail (VVPAT). This VVPAT will be kept in a secure location and will only be opened by King County election officials for auditing purposes or in the event of a recount. Washington State law requires that 4 percent of all machines deployed in a jurisdiction be audited, regardless whether or not a ballot was cast. The audited machines are selected by political party observers in a random and transparent manner. In the fall 2006 election cycle, of the 508 machines deployed at the polls, 21 will be manually audited.

The audit includes comparing the electronic and manual tally of all ballots cast on the machine.

Chain of custody procedures are also in place to ensure the physical security of the VVPAT. Poll workers are trained in these practices and use the same security procedures used for voted and unvoted ballots.

Brennan Center Recommendation #2
Conduct parallel testing.
King County is currently in discussions with the Office of the Secretary of State regarding options for parallel testing. With the requirement for the VVPAT, the parallel testing requirements in the Washington Administrative Code were removed.

Brennan Center Recommendation #3
Ban wireless components on all voting machines.
The Brennan Center warns against the presence of wireless channels. Accessible voting units in King County have no wireless components. The units are not networked to each other, nor are they ever connected to either the Internet or an intranet. The King County Elections procedures in place ensure the accessible voting units are completely isolated throughout Election Day. In addition, King County will not modem in results from poll vote counting equipment which includes both accessible voting units and AccuVote machines which tally paper ballots. Instead, results will be manually uploaded to enhance security.

Brennan Center Recommendation #4
Mandate transparent and random selection in auditing procedures.
Accessible voting machines selected for audit are drawn randomly by lot and by political party observers in a transparent and objective manner. The entire auditing process and all auditing procedures are open to the public and observed by political party observers. Random and transparent audits are done to catch fraud or mistakes in the vote totals. The audit performed in the May 2006 special election resulted in a perfect match between the electronic and paper vote totals.

Brennan Recommendation #5
Ensure decentralized programming and voting system administration.
Members of King County Elections' staff are responsible for ballot layout and the programming for all elections administered in King County. The ballot layout and programming takes place in county elections offices, in rooms under camera surveillance with controlled and tracked access. The "live election database" used for cumulating results and certifying the election is created by and under control of King County elections staff at all times.

Brennan Center Recommendation #6:
Implement effective procedures for addressing evidence of fraud or error.
In the event of the evidence of fraud or a malfunction, Washington State Law requires that a report detailing the facts and circumstances be made to the county canvassing board. The canvassing board will then make a determination based on the laws and regulations of the state on how to appropriately resolve the situation. (See RCW 29A.60.210)

Additional King County Voting System Security Measures

A voting system must pass three levels of tests before it can be used in Washington:

1. Federal Qualification Tests;
2. State Certification Tests;
3. Local Acceptance Tests.

King County Elections is restricted in using voting systems, equipment and software that has been certified through the Washington's Secretary of State's Office. Currently four vendors are certified for use in Washington State. Washington State law adds the further requirement that equipment must be certified at the federal level. Once the equipment is certified by State and Federal agencies, King County Elections conducts further quality checks through strict procedural acceptance testing of voting equipment.

Stand-alone server technology

- The computer servers hosting the ballot tabulation, building program and associated components used by King County stand-alone and are not connected to an intranet or the Internet. The servers are stored in locked cabinets in secure access controlled rooms and/or cages. Logging into the servers and ballot programming requires dual passwords held by limited individuals within the Elections staff.

HASH-tested software

- To ensure that King County uses the exact same programming code tested and approved by the Independent Testing Authorities, the software components of the tabulating system used in King County are code tested line for line. The software programming code provided to King County by the vendor has been proven to be exactly the same as the programming code deposited in the National Institute of Science and Technology Software Library.

  (King County Elections voting systems software has undergone and passed a hash code test. A hash code is a large number computed from the entire string of bits that form the file. The hash code is computed in such a way that if one bit in the file is changed, a completely different hash code is produced. To minimize the possibility that two different files may generate the same hash code, a sufficiently large hash value is computed. Using this method, files from two software codes are "fingerprinted" and those fingerprints are compared. Files that have matching hash values can be discarded from the investigation without further examination; those that do not match the database should be examined further. See www.nist.gov for more info.)

Procedural checks for logic and accuracy

- Prior to every election, King County Elections subjects each accessible voting unit to logic and accuracy testing. That rigorous testing procedurally checks that each machine properly records, counts and tabulates results correctly. A voting machine must pass logic and accuracy testing before it is set for the election, and then the database memory card is sealed in the unit to prevent tampering. An extensive audit trail is maintained of this process including detailed checklists. This legally-required testing is conducted in the presence of political party observers and is open to the public.

Secured ballot storage

- All electronic media storage used in accessible voting units is tracked and accounted for in the same way paper ballots are handled throughout the entire elections process.

Encrypted election-specific codes

- The tabulation system for the accessible voting units utilizes a Key Card Tool encryption program that sets an encrypted code that is required for any voter card, supervisor card or memory card to be used in a device. The code changes prior to each election. This encryption protects against memory and voter access cards from previous elections or from outside the election environment being used in a current election.

Backup memory storage

- The ballot selections made by the voters are stored in three locations: In a printed version on the voter verified paper audit trail; in flash memory within the accessible voting unit tablet; and on an internal memory card stored and sealed within the voting device. The electronic results are encrypted in both the flash memory and on the memory card. In the event of a recount, the paper ballot or VVPAT becomes the official ballot.

Polling place security procedures

Studies of jurisdictions that experienced problems with vote counting equipment share a common theme of inadequate poll worker training and insufficient procedures. King County carefully tracks lessons learned across the nation and has implemented many of these best practices and security standards. In King County, each polling place is staffed by sworn election workers, who have attended mandatory training. There are numerous checks and balances in place, including separation of duties as each voter moves through the polling place:

- On Election Day, a separate judge is dedicated to the accessible voting unit. That judge receives specialized training and maintains control of the machine key. A training video is mailed to every Inspector and AVU judge a week before the election to remind them about important procedures from their training session.

- Before opening the polls, a "zero proof" printout from each voting machine verifies to election judges there are no votes stored on the memory card and that the races are properly coded for the precinct and election. This report is printed twice (one is kept in the security canister for auditing purposes, and one is sent to canvassing), and is signed by three election workers.

- A voter access card is issued only to qualified voters and not issued until proper identification is shown. Only then is a voter access card programmed for the voting machine.

- The voter access cards are programmed as a one-time use only and are collected after voters are finished voting by the AVU judge.

- Each voter is escorted to an accessible voting unit by an AVU Judge.

- Troubleshooters are assigned to regional zones of between 12 and 16 polling places on Election Day and respond to AVU issues such as printer issues or to replenish supplies and troubleshoot problems. This specialized group of 55 people receives 16 hours of mandatory, hands-on training prior to each election.

- A summary report printout from each AVU confirms the total number of ballots cast on each unit. Three copies of this report are printed (one is kept in the security canister for auditing purposes, one is sent to canvassing, and one is posted in a public place). These are again signed by three election workers.