HB

459

HOUSE COMMITTEE REPORT

(7)
Date Referred to Committee: February 16, 2004 FURTHER REFERRALS:

Date of Committee Action: April 1, 2004

The STATE AFFAIRS Committee considered: HB 459

HOUSE BILL NO. 459 PAPER TRAIL FOR ELECTRONIC VOTING MACHINE

"An Act requiring an auditable paper trail for electronic voting machines; and providing for an effective date."

Recommends it be replaced with [ ] HCS *or* [✓] CS for HB 459 (STA)
For Senate Bills with new title: [ ] Technical Title [ ] New Title: HCR_____ [ ] Same Title [✓] New Title

[ ] attach amendments
[ ] add new referral to _____Committee
[ ] Letter of Intent_____Committee

List of Abbrev for Depts.:
ADM
CED
COR
CRT
EED
DEC
DFG
GOV
HSS
LEG
LAW
LWF
MVA
DNR
DPS
REV
DOT
UA

NEW FISCAL NOTES *Assigned by Chief Clerk's Office				
List by Dept(s):	*FN#	Fiscal	Indet.	Zero
Gov		✓		

PREVIOUS FISCAL NOTES				
List by Dept(s):	FN#	Fiscal	Indet.	Zero

Signing with recommendations	Printed Last Name	DP	DNP	NR	AM
Paul K Seaton	SEATON	✓			
Mrs Swenson	Swenson	✓			
	Holm	✓			
John Coghill	Coghill	X			
				—	
Chair: Bill Hawker	Weyhrauch	X			
Chair:					

Alaska State Legislature

House of Representatives

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Representative Les Gara

HB 459, Voter Verified Paper Trails for Electronic Voting Machines

Sponsor Statement

In the wake of the 2000 federal election, and with the impetus of the federal Help America Vote Act, states across the nation are replacing punch card and paper ballots with computerized vote casting, tabulation and reporting. Alaska has successfully used the AcuVote system of optically scanned ballots since 1998. New direct recording equipment (DRE) machines – also known as touch-screen – are scheduled to be used for the first time in 2004.

Unfortunately, computer experts have warned of numerous problems with both DRE and optical scan machines. Hardware problems, unreliable computer code and lack of security have raised serious questions about whether votes are being accurately recorded, tallied and reported. The experiences of many localities have demonstrated these failings. In Bernalillio County, N.M. a programming error caused a computer to delete 25 percent of the ballots cast by early voters. In Maryland voters for the Republican candidate for governor watched as their vote appeared beside the Democratic candidate's name. In Fairfax County, Va. a machine was found to have subtracted one vote for every 100 cast for a school board candidate. In one Texas matchup, optical scan machines declared two low vote getters to be landslide winners.

In the Texas case, elections officials were able to correct the mistake by hand counting the optically scanned paper ballots. Many DRE machines, however, produce no such paper trail to audit. Recognizing this crucial shortcoming of DRE technology, many observers are calling for voting machines to produce paper receipts that voters can verify before leaving the polling booth and that are subsequently held in lock boxes for audit purposes. The State of California recently moved to require such a voter verified paper audit trail in all elections. Senate Bill 296 would establish the same protections in Alaska.

Citizen trust in elections is the bedrock of democracy. Only an accurate count can assure voters that elections result in a true reflection of their will. Requiring a voter verified paper trail will assure Alaskans that no matter what technology is adopted in the future, their elections will be transparent and their votes counted accurately.

E-mail: Representative_Les_Gara@legis.state.ak.us

FISCAL NOTE

STATE OF ALASKA
2004 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: HB 459
() Publish Date:

Revision Date/Time (Note if correction):
Dept. Affected: OOG
Title: An Act requiring an auditable paper trail for electronic voting machines
RDU: Elections
Component: Elections
Sponsor: Representative Gara
Requester: House State Affairs
Component No. 21

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Personal Services						
Travel						
Contractual						
Supplies	1.8		1.8		1.8	
Equipment	441.0					
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**442.8**	**0.0**	**1.8**	**0.0**	**1.8**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF			1.8		1.8	
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)	442.8					
TOTAL	**442.8**	**0.0**	**1.8**	**0.0**	**1.8**	**0.0**

Estimate of any current year (FY2004) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

At this time, the cost per unit to implement a modification to the touch screen voting equipment that would allow for voter verifiable paper records is unknown. This technology is currently in the research and development stage within the industry. However, it is estimated that each touch screen voting system would require additional hardware i.e., unit printer and 2 rolls of thermal paper. The division estimates the printer units may range in price from $500.00 - $1,000.00. If only one touch screen system were used in each precinct (441 precincts) the estimated cost would be $441.0. The thermal paper required is estimated to cost $2.00 per roll for an additional cost of $1.8 in supplies. The total estimated cost of implementation by January 1, 2006, is $442.8 (HAVA funds). The division will require GF appropriations of $1.8 in future years for supplies (thermal paper) to support the equipment that provides a voter verifiable paper record.

Prepared by: Leonard G. Jones — Phone 465-3051
Division: Division of Elections — Date/Time 3/5/04 2:56 PM
Approved by: Laura A. Glaiser, Director — Date 3/5/2004
Agency: Office of the Lt. Governor, Division of Elections

(Revised 12/2003 OMB)

adn.com
Anchorage Daily News

Opinion

(Published: February 8, 2004)

Paper trail

Integrity of Alaskans' votes at risk

Here's a bill in the Legislature that should see speedy passage. SB 296, from Sen. Johnny Ellis, D-Anchorage, would help prevent vote fraud by requiring electronic voting machines to produce a paper record of the votes that are cast.

The state's main electronic vote counting machines, Accu-vote optical scanners, aren't a problem. They use paper ballots that are read and tabulated electronically. But the state recently bought 55 touchscreen electronic voting machines that leave no paper trail whatsoever. The paperless machines are meant to accommodate voters who are physically unable to handle or mark a paper ballot. Eventually the state plans to have at least one touchscreen voting machine in each of Alaska's 446 precincts.

That's a helpful accommodation for disabled voters. But where there is no paper trail, there is huge potential for voting fraud. According to The New York Times, "When the State of Maryland hired a computer security firm to test its new (paperless electronic voting) machines, these paid hackers had little trouble casting multiple votes and taking over the machines' vote-recording mechanisms." With no paper trail, there is no way to cross-check the vote count.

In an editorial, The Times concluded: "The Maryland study shows convincingly that more security is needed for electronic voting, starting with voter-verified paper trails." That's what Sen. Ellis aims to do with SB 296.

Alaska has a statewide primary and a statewide general election this year. Alaskans must have confidence their votes will be counted securely and accurately. The protections outlined in Sen. Ellis' bill should be put into place as soon as possible.

BOTTOM LINE: Alaska law should require electronic voting machines to produce a paper record of each vote.

Fairfax Judge Orders Logs Of Voting Machines Inspected

By David Cho
Washington Post Staff Writer
Thursday, November 6, 2003; Page B01

It took more than 21 hours from the time polls closed Tuesday night for Fairfax County, the putative high-tech capital of the region, to get final election results from its new, computerized vote machines.

Widespread problems in the system, which the county paid $3.5 million to install, also opened the door to possible election challenges by party leaders and candidates.

School Board member Rita S. Thompson (R), who lost a close race to retain her at-large seat, said yesterday that the new computers might have taken votes from her. Voters in three precincts reported that when they attempted to vote for her, the machines initially displayed an "x" next to her name but then, after a few seconds, the "x" disappeared.

In response to Thompson's complaints, county officials tested one of the machines in question yesterday and discovered that it seemed to subtract a vote for Thompson in about "one out of a hundred tries," said Margaret K. Luca, secretary of the county Board of Elections.

"It's hard not to think that I have been robbed," said Thompson, whose 77,796 recorded votes left her 1,662 shy of reelection. She is considering her next step, and said she was wary of challenging the election results: "I'm not sure the county as a whole is up for that. I'm not sure I'm up for that."

Meanwhile, attorneys for local Republicans and GOP candidate Mychele B. Brickner, who lost her bid to chair the Fairfax County Board of Supervisors, went before a Circuit Court judge yesterday morning, asking him to keep 10 voting machines under lock and key and not to include their tabulations in the results. The machines, from nine precincts scattered across the county, broke down about midday Tuesday and were brought to the county government center for repairs and then returned to the polls -- a violation of election law, Republicans argued.

The judge said the activity logs of all 10 machines will be inspected this week, with members of both major parties present.

"It's like Florida in many ways," said the Republicans' attorney, Christopher T. Craig, referring to that state's 2000 presidential ballot-counting controversy. "This is about ballot integrity. . . . A lot of people have been telling us they couldn't vote for someone. . . . I have been hearing that there are a lot of problems" with the county's new WINvote computer technology.

As more details emerged yesterday, county officials defended the system. Luca insisted that most of the problems had less to do with computer glitches than human error.

"The new machines get an A-plus," she said. "It's the plan to collect the vote that gets the failing grade."

Fairfax purchased the 1,000 touch-screen vote machines this year from Advanced Voting Solutions of Frisco, Tex. The machines, which resemble laptop computers, were used countywide Tuesday for the first time, and the problems that resulted mirrored what occurred in Montgomery County last year when similar new technology was used. The equipment in Montgomery County was blamed for delayed results and confusion at the polls.

Fairfax officials had confidently promised that their machinery would work much better, citing a battery of tests conducted last week. They also predicted that the system would greatly speed the reporting of results.

Instead, it churned out one of the slowest vote counts in memory.

Much of the delay occurred at 7 p.m. when the polls closed. Most of the county's 223 precincts attempted to send in their computer tallies at once, overloading the system. Many poll officials ended up calling in their numbers, but some couldn't get through and instead drove their results to the county government center.

In at least 19 precincts, results were officially sealed in the mistaken assumption that they had been sent by computer modem, officials said yesterday. Sealed results cannot be opened unless all three election board members are present, which led to further delays.

In addition, software errors kept the results from two precincts from being posted until about 4:30 yesterday afternoon.

"Everyone seems to be aghast at how this could happen," Thompson said. "But this seems like something you could have had the foresight to see."

John Service, 50, of North Springfield said it took him four or five tries to register his vote for Thompson, and he wondered whether some voters were disenfranchised. "I am concerned about voters who might have been in a rush and didn't go back and check to make sure all the names [they intended to vote for] appeared on the final ballot," he said.

The glitches forced a handful of precincts to return to paper ballots. And even at polls where computer problems didn't arise, voter unfamiliarity with the technology created long lines.

Some voters gave up -- a thought that crossed Jeff Fisher's mind.

Fisher, 43, of Annandale said he almost walked out of his polling place when a woman in front of him spent 10 minutes getting through the ballot.

Others, though, wondered why so many people had problems with the machines. "I thought it was very easy to vote, and I'm not even that bright of a kid," Al Richards, 61, of Falls Church said.

Posted on Sun, Feb. 01, 2004

ELECTRONIC VOTING'S HIDDEN PERILS

By Elise Ackerman
Mercury News

Poll workers in Alameda County noticed something strange on election night in October. As a computer counted absentee ballots in the recall race, workers were stunned to see a big surge in support for a fringe candidate named John Burton.

Concerned that their new $12.7 million Diebold electronic voting system had developed a glitch, election officials turned to a company representative who happened to be on hand.

Lucky he was there. For an unknown reason, the computerized tally program had begun to award votes for Lt. Gov. Cruz Bustamante to Burton, a socialist from Southern California.

Similar mishaps have occurred across the country since election officials embraced electronic voting in the wake of the Florida vote-counting debacle of 2000.

When Californians go to the polls next month to choose a presidential candidate, many voters will cast a virtual ballot by pressing a computer touch screen that records their votes digitally. The only tangible proof that a citizen has voted -- and how he voted -- will be fingerprints left on the machine's screen.

Electronic voting removes the risk of election officials misinterpreting hanging chads. But it raises another electoral peril: that a digital ballot box might miscount votes without anyone noticing.

As the black box replaces the ballot box, concern is growing that local officials are becoming dependent on a handful of corporations to guarantee the integrity and accuracy of elections.

Counties, including Santa Clara County, rely on these voting-equipment companies to manage the software that runs digital voting machines and counts electronic votes -- and to fix things when they go wrong on election night. The companies, however, consider such software a trade secret, making independent confirmation of contested elections difficult, if not impossible.

To guard against error and fraud, the state requires that the companies only install approved software on electronic voting machines. But in California, one of the biggest voting-equipment companies, Diebold Election Systems, provided 17 counties with uncertified software that was used in recent elections.

Review of practices

County election officers remain responsible for overseeing electronic voting systems, but a review of past elections and current practices raises questions about how closely they're monitoring voting-equipment companies.

``My biggest concern is the lack of accountability,'' said David Dill, a Stanford University computer-science professor and a leading expert on electronic voting.

Election officials and company representatives dismiss concerns about computerized voting as overblown, citing safeguards designed to ensure the reliability of computerized voting systems.

``We have the best system available on the market. It is secure and reliable and the voting public had a wonderful experience,'' said Jesse Durazo, the registrar of voters for Santa Clara County, which uses touch-screen machines from Sequoia Voting Systems.

Alameda County officials still don't know why the computer program failed on election night. In fact, they only discovered the malfunction because they could compare the paper absentee ballots the software was counting to the computer's tally. The rest of the county's voters cast electronic ballots. Nor were election workers aware at the time that their touch-screen machines were running unauthorized Diebold software in violation of California law, as a state investigation later discovered.

``There was something in the software,'' said Elaine Ginnold, assistant registrar of voters for Alameda County. Alameda County officials refused to allow the Mercury News to review the software code used to test its electronic voting system, saying it was a Diebold trade secret.

``At no time were incorrect vote totals released,'' Diebold spokesman David Bear wrote in an e-mail. ``The system is safe, secure and accurate.'' He attributed the malfunction to a computer-server error and the large number of candidates on the recall ballot.

``The counties are in over their heads,'' said Kim Alexander, founder of the California Voter Foundation, a Davis-based election watchdog group. ``People are left depending on the vendors to tell them who won the elections.''

That is especially the case on election night, when mechanical mishaps and buggy computer code could create crises only company employees could resolve.

For instance, in Riverside County during the 2000 presidential election, a computer from Sequoia began dropping touch-screen ballots from the vote tally. A Sequoia salesman who was on hand intervened and fixed the problem.

Unnoticed error

Two years later in Bernalillo County, N.M., neither local election officials nor a Sequoia representative noticed on election night that a programming error was causing a computer running Microsoft SQL server software to delete 25 percent of ballots cast by early voters. Three days later, a Democratic Party lawyer spotted a discrepancy between the number of voters who signed in at the polls and the number of digital ballots counted. Sequoia then managed to recover the lost votes.

``They messed up,'' said Mary Herrera, the Bernalillo County clerk, of Sequoia.

Responded Sequoia spokesman Alfie Charles: ``It was just a bug in Microsoft that required an additional step in converting data into the database format. There was a patch that was later applied by Microsoft.''

Alexander of the California Voter Foundation worries that such incidents mean the machines could miscount ballots or fail to register votes without anyone realizing.

Critics are alarmed that touch-screen voting systems do not create a paper record that allows for a physical recount of ballots. Rather, the machines record votes on digital memory cartridges. When the polls close, the cartridges are removed from the touch-screen machines and plugged into a computer which downloads and tabulates the voting data.

In November, California Secretary of State Kevin Shelley ordered that by July 2006 all touch-screen machines must print paper receipts so an election can be independently audited. To meet that mandate, the voting-equipment companies must manufacture new state-approved hardware and software.

Computer scientists acknowledge a paper trail will help ensure the accountability of electronic voting systems. However, they say such a requirement does not resolve concerns over counties' dependence on voting-equipment companies and the security of computerized voting.

Until voting machines produce paper receipts, the only way a candidate can investigate questionable election results is by examining the voting systems' software code.

But there's a catch: Election companies consider such software a trade secret not open to public scrutiny -- or subject to challenge from losing candidates, as Emil Danciu found out.

Danciu ran for city council in Boca Raton, Fla., in March 2002. A popular former mayor of the seaside town in Palm Beach County, Danciu expected to win in a landslide but lost by 16 percentage points.

After some voters complained that Sequoia's touch-screen machines appeared to have recorded ballots cast for Danciu as votes for his opponents, Danciu sued to obtain the Sequoia software code.

But Palm Beach County didn't have the code. ``All of this stuff that they are asking for are all proprietary items owned by the manufacturer,'' a county attorney told the judge hearing the case. The attorney argued that even if the county did have the documents, it would be a felony to disclose ``trade secrets.''

The judge denied Danciu's request for the software code.

U.S., state inspectors

County election officers and voting-equipment company executives stress that voting machines and software are carefully examined by federal and state inspectors before receiving approval. Furthermore, they say, pre-election testing ensures ballots are counted correctly.

``There are checks and balances to ensure nothing has been compromised,'' said Charles, the Sequoia spokesman.

The goal of the government certification process is to make sure proprietary voting systems are accurate, reliable and secure. The certification process is crucial because it provides the only safeguard voters have that the machines are performing the way the election companies promise.

``Every single piece of hardware and software that is used in an election is certified by our office,'' state election official John Mott-Smith reassured the Santa Clara County Board of Supervisors last year. ``Every modification to those systems has to come back for certification and testing if necessary.''

Yet eight months later, a state audit revealed that voters in 17 California counties had cast ballots in recent elections on Diebold systems that were running software not approved by the state, according to a December 2003 report. The Diebold software is used to count both touch-screen electronic ballots and paper ballots read by an optical scanner. Three of the counties, including Los Angeles, the state's largest, were using Diebold software that had not been submitted for federal review.

Assurances by vendor

The audit also found that county election officials had not independently verified they were using certified software, as the law requires, but relied on assurances by Diebold it was complying with state regulations.

Even tech-savvy counties like Santa Clara can have difficulty tracking exactly what their voting-equipment company is doing for them. Computer scientists argue that a failure to keep close tabs on modifications to the machines or their software opens the door to tampering or the introduction of errors that might show up on election night.

Following November's election in Santa Clara County, Sequoia sent over a group of blue-coated technicians to make adjustments to voting machines that experienced battery problems. For three weeks, the workers, employed by a Sequoia subcontractor, took apart the machines, removing their circuit boards and making adjustments.

Nevertheless, Santa Clara County officials didn't know the name of the subcontractor and hadn't verified the identities of the workers it hired when the Mercury News made an inquiry. They also hadn't documented the changes being made to the machines.

To find out such information, ``you'd have to contact Sequoia,'' said Assistant Registrar of Voters Elaine Larson.

In interviews with the Mercury News, registrars defended their close relationship with the companies. The world of elections administration is a small one, and the revolving door between state, federal and county elections departments and the voting-equipment companies has spun for years.

``I have a hundred percent confidence in Sequoia -- in their integrity and honesty and their ability to keep us compliant with the law of California,'' said Cathy Darling, assistant registrar of Shasta County.

That attitude bothers Dill, the Stanford computer scientist and electronic-voting expert. ``From a computer-security perspective, handing over control of an important part of the election, I think, is not a good idea,'' said Dill. ``I'd prefer to see that kind of control in the hands of local officials who are accountable to elected representatives.''

Contact Elise Ackerman at eackerman@mercurynews.com or (408) 271-3774.

NEWS RELEASE

CALIFORNIA SECRETARY OF STATE **KEVIN SHELLEY**

KS03:106

FOR IMMEDIATE RELEASE
Friday, November 21, 2003

Contact: Terri M.Carbaugh
Doug Stone
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Secretary of State Kevin Shelley Announces Directives To Ensure Voter Confidence in Electronic Systems

Beginning July 1, 2005, All Touch Screen Systems Purchased Must Have a Paper Audit Trail

SAN FRANCISCO --- Secretary of State Kevin Shelley today announced that beginning July 1, 2005, no county or city may purchase a touch screen voting system that does not include an accessible voter verified paper audit trail (VVPAT). As of July 2006, all touch screen voting systems used in California, regardless of when they were purchased, must have a VVPAT that can be used by all voters, including the visually impaired, to verify that their preferences are accurately recorded.

In making the announcement, Secretary of State Shelley said that a transition period is necessary in order to assure the fair and efficient conduct of elections in California.

"The schedule I have set forth for implementing a VVPAT will ensure that there is adequate time for new voting systems to be properly certified. This also allows time to train elections officials and poll workers and to educate voters," he said.

To further enhance voter confidence in new technologies, Secretary Shelley is adopting voting system reforms and new electronic certification procedures. Shelley will also call upon the federal government to substantially improve its testing process.

"As the state progresses with new technology, all Californians must have confidence that every vote cast is a vote counted," said Secretary of State Kevin Shelley. "These new requirements will provide this confidence."

In addition to providing for a VVPAT, Shelley's reforms call for additional requirements for software testing and auditing, new security protocols for manufacturers, random field testing on Election Day to ensure proper performance of individual voting machines, and the creation of a state Technical Oversight Committee.

In February 2003, Shelley convened an Ad Hoc Touch Screen Task Force composed of computer experts, members of the public, and representatives of the disabled community and election officials to make recommendations to increase the security of voting equipment software. The task force issued a series of recommendations for Shelley's consideration.

A complete copy of Secretary Shelley's directives and the recommendations of the Ad Hoc Touch Screen Task Force are available on the Secretary of State's website, at http://www.ss.ca.gov/elections/touchscreen.htm.

-30-

SunSpot.net

http://www.sunspot.net/news/local/bal-te.md.machine30jan30,0,4050694.story?coll=bal-local-headlines

Md. computer testers cast a vote: Election boxes easy to mess with

In Annapolis, tales of trickery, vote rigging

By Stephanie Desmon
Sun Staff

January 30, 2004

For a week, the computer whizzes laid abuse - both high- and low-tech - on the six new briefcase-sized electronic voting machines sent over by the state.

One guy picked the locks protecting the internal printers and memory cards. Another figured out how to vote more than once - and get away with it. Still another launched a dial-up attack, using his modem to slither through an electronic hole in the State Board of Elections software. Once inside, he could easily change vote totals that come in on Election Day.

"My guess is we've only scratched the surface," said Michael A. Wertheimer, who spent 21 years as a cryptologic mathematician at the National Security Agency.

He is now a director at RABA Technologies in Columbia, the firm that the state hired for about $75,000 to look at Maryland's new touch-screen voting machines scheduled to be unveiled in nearly every precinct in Maryland for the March 2 primary.

The state has no choice but to use its $55 million worth of AccuVote-TS machines made by Diebold Election Systems for the primary. The old optical scanners are gone.

Yesterday, Wertheimer calmly presented his eight-member team's findings to committees in the House and Senate, explaining the weaknesses they discovered and a plan for how to plug many of the cracks, at least in the short run.

Giddy geek speak

Yet on a recent morning at his offices, Wertheimer's computer programmers were practically giddy as they invented new ways to muck up an election. Some were simple - like the lock-picking or just yanking the cords out of a machine's monitor, disabling it for the rest of the day.

Other fiddling inspired round after round of excited geek speak, true gibberish to the untrained ear, to explain a host of attacks that could be launched up close or by modem.

One thing was clear: There are many ways to fool with Diebold's machines, some of which could lead to an Election Day disaster. At the same time, some scenarios were far-fetched and too difficult to pull off

undetected, team members acknowledged.

But the fact that they could happen makes it impossible to have full confidence in the system, they said.

In the short term, they said, enough fixes can be done to ensure a secure election in March. But much more will need to be done to see that future elections on the machines can also be relied upon.

Diebold officials say many of the problems that were found have been fixed.

"They threw out theoretical things that could happen," spokesman David Bear said of the testing team. "But the polling places are much different."

The team was asked to answer two major questions, Wertheimer said: Do the machines count votes accurately? And do they need paper receipts?

If left alone, Wertheimer said, the machines will count quite accurately - more so than any past voting method.

But he has made a good living off the fact that there are plenty of people out there looking to wreak havoc when they can.

Web sites abound with all kinds of speculation about how easily the voting machines can be hacked into and outcomes manipulated.

Prominent computer scientists have studied the Diebold code - some of which was found unprotected on the Internet - and found hole after hole in its security.

Theories have run rampant as to how to best clean up what critics call a mess.

Paper receipts

Wertheimer said he thinks there will be a need for some type of paper receipt, what some call a voter-verified paper trail - basically a printout of each vote as it is cast for the voter to check before leaving the polling place. Without a paper ballot, many say, a proper recount is impossible.

Wertheimer said it would take nearly a complete rewrite of the computer code to fix the machines' flaws.

"For a guy who just wants the vote to be accurate, I'd rather dumb down the software and add receipts," he said.

Diebold "basically had no interest in putting actual security in this system," said Paul Franceus, one of the consultants. "It's not like they did it wrong. It's like they didn't bother."

Mark McLamon had something up his sleeve as he approached one of the voting machines. A close look revealed the cord of a portable keyboard. He had learned that he could quickly pick a lock on the side of the machine, plug in his keyboard and wreak havoc on the results stored inside - all while likely going undetected by poll judges.

Using a low-tech solution, such as tape that reveals tampering, could keep people like McLamon at bay, at least as a temporary fix, the consultants said.

Low-tech hacking is also a possibility, though.

Someone bent on causing trouble could call a polling place and tell workers that the state's modem is down and results should be called in on a new phone number. Then the troublemaker could simply change the results before sending them onto the state.

While results can now be encrypted - after criticism that they weren't being - something called authentication is missing. Authentication tells the main computer that the person sending in results is the one who is actually permitted to do so.

Sneaking in, via modem

Meanwhile, William A. Arbaugh, an assistant computer science professor at the University of Maryland, College Park and part of the team, easily sneaked his way into the state's computers by way of his modem. Once in, he had access to change votes from actual precincts - because he knew how to exploit holes in the Microsoft software.

Those holes should have been patched through regular updates sent to customers, patches that haven't been installed on the elections equipment since November.

"There's no security that's going to be 100 percent effective. But the level of effort [needed to get into the system] was pretty low," Arbaugh said. "A high school kid could do this. Right now, the bar is maybe 8th grade. You want to raise the bar to a well-funded adversary."

"Every system is vulnerable somehow," said Karl Aro, director of the state's Department of Legislative Services, who commissioned the study for the legislature. "The system's not bad but it needs some work."

No system is completely secure. In fact, the more elections the state holds, the more opportunities there will be for hackers to see how it works and launch new attacks, experts said.

"If you had the time and the money, the sky's the limit on what you could do to make a secure system," McLarnon said.

"You just need to raise the level of effort needed to exploit it so it's not feasible to do," said fellow consultant John Ormonde.

VerifiedVoting.org

Friday, January 30, 2004

Understanding The Problem

"Imagine, it's Election Day 2004. You enter your polling place and go to cast your vote on a brand new 'touch screen' voting machine. The screen says your vote has been counted. As you exit the voting booth, however, you begin to wonder. How do I know if the machine actually recorded my vote? The fact is, you don't."
~ Representative Rush Holt (NJ).

The problem is simple: A touch screen voting machine records your vote in the memory of the machine, where you can't see it. How do you know your vote for candidate A wasn't recorded as a vote for candidate B? You don't!

Many states and communities are planning to buy massive numbers of so-called "Direct Recording Electronic" (DRE) machines (paperless touch screen are DREs, but there are other kinds of DREs that use dials or switches instead of touch screens). Some are already using them.

Unfortunately, these machines are dangerous for democracy. With the computer technology they are using, there is always a risk that a program flaw or, worse, tampering with the software could change votes and even change the outcome of elections. And these changes might not be detected! Since ballots are secret, once the voter leaves the booth there is no one who can detect or correct any errors that the machine made in recording the votes. If the election results are obviously absurd, as happens occasionally with other kinds of vote-counting equipment, the only options will be to accept an obviously wrong election result or hold a new election.

The solution is simple: require there to be a "voter verifiable audit trail" with all voting equipment. A voter verifiable audit trail is a permanent record of each vote that the voter can check to ensure that it represents their intent. These votes are deposited in a secure ballot box. If there is a manual recount, we can be sure that the votes being counted are what the voters wanted to cast.

Without this requirement, we can never again have confidence that our elections reflect the will of the voters, as opposed to a random error or the will of someone who tampered with the voting machines.

HAVA: The Reason Behind The Rush To Install New Voting Equipment

HAVA, the Help America Vote Act, was passed by congress in October of 2002. The purpose of the Act is:

To establish a program to provide funds to States to replace punch card voting systems, to establish the Election Assistance Commission to assist in the administration of Federal elections and to otherwise provide assistance with the administration of certain Federal election laws and programs, to establish minimum election administration standards for States and units of local government with responsibility for the administration of Federal elections, and for other purposes. <<NOTE: Oct. 29, 2002 - [H.R. 3295]>>

It is this Act, with specific dates, that require the States to update old voting equipment so that a similar situation (as what occurred in Florida) will not occur again.

In the rush to pass this new Act some key elements were left out, such as a "voter verifiable paper receipt". The newest Act, introduced by Representative Rush Holt, hopes to update the original

ADDITIONAL RESOURCES

Here are links to b statements and su the problem.

▸ **Johns Hopkin Study**
A major electronl machine maker, has its "leaked" s code evaluated b computer scientis BAD NEWS for Di

▸ **FAQ**
If you only read (thing on this topl should probably r Questions and An page to address l questions that co regularly.

▸ **PPT Presentat**
Here is an abbrev presentation Dav gave: (Powerpoir gives a good ove the problem as o 6, 2003.

▸ **Recorded Int**
A story produced Speech Radio Ne which includes in with Rebecca Mer and David Dill.

▸ **A statement b Rebecca Mercu**

▸ **An essay by K Alexander of th California Voter Foundation.**

▸ **Letter from th USACM to the H Science Commi**

HAVA Act with specific solutions to the question of voter verified paper receipts and other obvious discrepancies.

More on HAVA

More on HAVA Deadlines

How I Can Help?

▶ **Peter Neuma catalog of rece voting machine problems.**

▶ **An interview with Peter Neu and Rebecca M**

Executive Summary

At the request of the State of Maryland, RABA Technology's Innovative Solution Cell (RiSC) performed a review of the DIEBOLD touch-screen electronic voting system. A team of security experts reviewed the SAIC report commissioned by Maryland and went on to hold a "Red Team" exercise to discover vulnerabilities in the actual voting system as it will be deployed for the March 2004 primary.

The key findings of this effort are two-fold. The State of Maryland election system (comprising technical, operational, and procedural components), as configured at the time of this report, contains considerable security risks that can cause moderate to severe disruption in an election. However, each of these vulnerabilities has a mitigating recommendation that can be implemented in time for the March 2004 primary. *With all these near-term recommendations in place*, we feel, for this primary, that the system will accurately render the election and is worthy of voter trust. However, between the March and November elections we strongly feel that additional actions must be taken to mitigate increasing risks incumbent on a system that will receive broad scrutiny. Ultimately we feel there will be a need for paper receipts, at least in a limited fashion.

Introduction

On November 10, 2003 the Department of Legislative Services, Maryland General Assembly of the State of Maryland (DLS) entered into an agreement with RABA Technologies, LLC to perform a "trusted agent" evaluation of certain aspects of the State Board of Elections plan to use touch-pad "Direct Recording Electronic" (DRE) devices for upcoming elections. The trusted agent role implies that RABA will provide *independent* assessments and will *not seek to profit* from its recommendations. RABA Technologies wishes to thank the State of Maryland for the opportunity to participate in this important project.

The specific requirements of the agreement were:

1. Examine and critique the study conducted by Aviel D. Rubin, known as the Hopkins study.
2. Examine and critique the methodology and practices used by SAIC in its review of the Diebold equipment and the Rubin report.
3. Examine and critique the conclusions reached by SAIC regarding the integrity of the Diebold voting machines and the overall security of Maryland's election procedures.
4. Examine and critique the IT Security Certification and Accreditation Guidelines as issued by the Maryland Department of Budget and Management.
5. Assist DLS in comparing existing SBE practices and procedures to those of the counterparts in other states.

To carry out the work, DLS provided RABA with copies of:

1. *Risk Assessment Report, Diebold AccuVote-TS System and Processes* (unredacted) dated September 2, 2003. This is SAIC-6099-2003-261.

Voting Machine Leaves Paper Trail

By Joanna Glasner

Story location: http://www.wired.com/news/business/0,1367,58738,00.html

02:00 AM May. 09, 2003 PT

Voting machines that print individual ballots -- an election accessory many computer scientists have clamored for -- are moving a step closer to widespread availability.

In response to concerns raised by election officials and security-minded techies, one of the largest makers of touch-screen voting machines has introduced a prototype capable of producing paper ballots.

Developed by Election Systems & Software of Omaha, Nebraska, the machine is currently in beta testing, with plans to make it commercially available by July.

"The idea is to provide a voter-verifiable ballot," said Lou Dedier, the ES&S vice president and general manager who built the original test model in his garage. Dedier said his mock-up was based on suggestions from elections administrators.

The planned rollout comes as a coalition of computer scientists, led by David Dill, a Stanford computer science professor, is lobbying election officials and voting machine manufacturers to fix security flaws in the current crop of touch-screen voting machines. The coalition believes the flaws are serious.

In particular, computing experts worry that hundreds of thousands of direct-recording electronic, or DRE, voting machines used in elections nationwide do not provide an auditable paper trail that records individual votes. In order to ensure that votes are not lost because of a computer malfunction or tampering, critics say DRE machines should be able to print and store individual ballots immediately after a vote is cast.

"I'm happy that some are trying to produce interesting solutions to the voter-verifiable audit-trail problem," said Dill. Although he does not endorse any particular voting machine vendor, he considers the ES&S prototype a

breakthrough for a major manufacturer.

As pressure mounts for paper receipts, ES&S is not the only one who may add on a ballot-printing feature.

Joe Richardson, a spokesman for Diebold Election Systems, one of ES&S's chief competitors, said the company would be willing to provide such a feature to U.S. customers if the demand is there. Richardson said the company included ballot-printing capability in more than 300,000 voting machines it sold to Brazil.

Avante International Technology, a developer of smart-card technology, recently introduced a machine called Vote-Trakker, which creates a paper ballot that voters can view and verify before exiting the polls.

Sequoia Voting Systems, another large maker of DRE machines, recently agreed to provide machines for Santa Clara County, California. Officials there plan to petition the secretary of state to approve a pilot project with paper records that voters can inspect starting in this November's election.

For ES&S, providing a ballot-printer capability isn't solely an altruistic move. Dedier said municipalities can expect to pay between $400 and $500 to add the ballot-printing feature to an existing machine.

The ballot-printing prototype by ES&S is quite similar to its standard DRE machine. In both cases, voters make their choices by touching the name of their preferred candidate or ballot proposition position on a computer screen.

The primary difference with the prototype model is that after votes are entered, a copy of a printed ballot appears behind a clear plastic screen. A voter can look at the printed ballot and press a button to submit it or to make changes. Submitted ballots get dropped in a box at the bottom of the machine for later counting.

Dedier said much of his original design was based on suggestions from Warren Slocum, chief elections officer for San Mateo County, California. Slocum, in turn, said his recommendations were influenced by security concerns raised by computer scientists.

"Part of my goal is to try to influence this public policy," said Slocum, who favors using printed ballots, rather than electronic records of votes, as the official ballot in case of a recount. Slocum said San Mateo, which primarily used optical-scan ballot machines, also made by ES&S, doesn't plan to use the printer-enabled machines this year, but may next year.

He believes touch-screen machines offer some advantages, such as the ability to provide voting in multiple languages without having to pre-print ballots for non-English speakers.

But the main purpose of adding ballot-printing capability, he said, is to ensure voters that in the event of a computer malfunction, their votes will still be accurately recorded on paper.

108TH CONGRESS
1ST SESSION

H. R. 2239

To amend the Help America Vote Act of 2002 to require a voter-verified permanent record or hardcopy under title III of such Act, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 22, 2003

Mr. HOLT introduced the following bill; which was referred to the Committee on House Administration

---

A BILL

To amend the Help America Vote Act of 2002 to require a voter-verified permanent record or hardcopy under title III of such Act, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Voter Confidence and Increased Accessibility Act of 2003".

SEC. 2. EXTENSION OF TIME PROVIDED FOR STATES TO REQUEST PAYMENTS UNDER TITLE I.

(a) PAYMENTS FOR ACTIVITIES TO IMPROVE ADMINISTRATION OF ELECTIONS.—Section 101(a) of the Help

America Vote Act of 2002 (42 U.S.C. 15301(a)) is amended by striking "not later than 6 months after the date of the enactment of this Act" and inserting "not later than the Tuesday next after the first Monday in November 2003".

(b) PAYMENTS FOR REPLACEMENT OF PUNCH CARD OR LEVER VOTING MACHINES.—Section 102(b)(1) of such Act (42 U.S.C. 15301(b)(1)) is amended by striking "not later than the date that is 6 months after the date of the enactment of this Act" and inserting "not later than the Tuesday next after the first Monday in November 2003".

(c) EXTENSION OF PERIOD OF AUTHORIZATION OF APPROPRIATIONS.—

(1) IN GENERAL.—Section 104(a) of such Act (42 U.S.C. 15304(a)) is amended by striking "$650,000,000" and inserting "an aggregate amount of $650,000,000 for fiscal years 2003 and 2004".

(2) DATE FOR TRANSFER TO ELECTION ASSISTANCE COMMISSION OF UNOBLIGATED FUNDS.—Section 104(c)(2)(B) of such Act (42 U.S.C. 15304(c)(2)(B)) is amended by striking "September 1, 2003" and inserting "January 1, 2004".

(d) REQUIREMENT TO DEPLOY INTERIM MEASURE IF WAIVER REQUESTED.—Section 102(a)(3)(B) of such Act (42 U.S.C. 15301(a)(3)(B)) is amended by striking the period at the end and inserting the following: ", except that any State requesting any such waiver shall accept and implement a paper system for use on an interim basis as provided in section 5(b) of the Voter Confidence and Increased Accessibility Act of 2003 in time for use in the November 2004 general election.".

SEC. 3. REPEAL OF EXEMPTION OF ELECTION ASSISTANCE COMMISSION FROM CERTAIN GOVERNMENT CONTRACTING REQUIREMENTS.

(a) IN GENERAL.—Section 205 of the Help America Vote Act of 2002 (42 U.S.C. 15325) is amended by striking subsection (e).

(b) EFFECTIVE DATE.—The amendment made by subsection (a) shall apply with respect to contracts entered into by the Election Assistance Commission on or after the date of the enactment of this Act.

SEC. 4. PROMOTING ACCURACY, INTEGRITY, AND SECURITY THROUGH VOTER-VERIFIED PERMANENT RECORD OR HARD COPY.

(a) IN GENERAL.—Section 301(a)(2) of the Help America Vote Act of 2002 (42 U.S.C. 15481(a)(2)) is amended to read as follows:

"(2) VOTER-VERIFICATION AND AUDIT CAPACITY.—

"(A) VOTER-VERIFICATION IN GENERAL.—The voting system shall produce a voter-verified paper record suitable for a manual audit equivalent or superior to that of a paper ballot box system, as further specified in subparagraph (B).

"(B) MANUAL AUDIT CAPACITY.—

"(i) The voting system shall produce a permanent paper record, each individual paper record of which shall be made available for inspection and verification by the voter at the time the vote is cast, and preserved within the polling place in the manner in which all other paper ballots are preserved within the polling place on Election Day for later use in any manual audit.

"(ii) The voting system shall provide the voter with an opportunity to correct any error made by the system before the permanent record is preserved for use in any manual audit.

"(iii) The voter verified paper record produced under subparagraph (A) and this

subparagraph shall be available as an official record and shall be the official record used for any recount conducted with respect to any election in which the system is used.

"(C) SOFTWARE AND MODEMS.—

"(i) No voting system shall at any time contain or use undisclosed software. Any voting system containing or using software shall disclose the source code of that software to the Commission, and the Commission shall make that source code available for inspection upon request to any citizen.

"(ii) No voting system shall contain any wireless communication device at all.

"(iii) All software and hardware used in any electronic voting system shall be certified by laboratories accredited by the Commission as meeting the requirements of clauses (i) and (ii).".

(b) VOTER VERIFICATION OF RESULTS FOR INDIVIDUALS WITH DISABILITIES.—Section 301(a)(3) of such Act (42 U.S.C. 15481(a)(3) is amended—

(1) in the heading, by inserting "AND VOTER-VERIFICATION OF RESULTS" after "ACCESSIBILITY";

(2) in subparagraph (B), by striking "; and" and inserting the following: ", and such voting system shall provide a mechanism for voter-verification of results which separates the function of vote generation from the function of vote casting in a manner analogous to that described in section 4 with respect to the separation of paper ballot generation and paper ballot verification and preservation, but does not require the use of paper.";

(3) by amending subparagraph (C) to read as follows:

"(C) The equipment deployed in accordance with subparagraph (B) shall meet the voting system standards for disability access and voter-verification of results as outlined in this paragraph in accordance with the deadline set forth in section 5(a), provided that if it does not and an interim paper system is deployed in accordance with section 5(b), disabled voters shall have the option of using the interim paper system with the assistance of an aide of the voter's personal selection or using the voting system otherwise put in place for use by disabled

voters at the time in question in accordance with the Help America Vote Act of 2002, as in effect prior to the enactment of this Act, except that the deadline set forth in section 301(a)(3)(C) of such Act (42 U.S.C. 15481(a)(3)(C)) is moved forward from January 1, 2007, to January 1, 2006."; and

(4) by adding at the end the following new subparagraph:

"(D) Election officials shall be instructed in the rights of the disabled to vote with the assistance of an aide of their selection under the Voting Rights Act of 1965.".

(c) SPECIFIC, DELINEATED REQUIREMENT OF STUDY, TESTING, AND DEVELOPMENT OF BEST PRACTICES.—In addition to any other requirements under the Help America Vote Act of 2002, the Election Assistance Commission shall study, test, and develop best practices to enhance accessibility and voter-verification mechanisms for disabled voters.

SEC. 5. CHANGE IN DEADLINE FOR COMPLIANCE WITH STANDARDS.

(a) IN GENERAL.—Section 301(d) of the Help America Vote Act of 2002 (42 U.S.C. 15481(d)) is amended by striking "on and after January 1, 2006" and inserting

"in time for elections for Federal office beginning with the regularly scheduled general election to be held in November 2004".

(b) INTERIM PAPER SYSTEM.—Each State and jurisdiction that certifies in the manner described in section 102(a)(3)(B) that it shall be unable to comply with the requirements of section 301 in time for the regularly scheduled general election for Federal office to be held in November 2004 shall receive a paper voting system, based on paper systems in use in the jurisdiction, if any, at the expense of the Commission that shall be deemed compliant with section 301 by the Commission for use in the November 2004 general elections.

SEC. 6. REQUIREMENT FOR FEDERAL CERTIFICATION OF TECHNOLOGICAL SECURITY OF VOTER REGISTRATION LISTS.

Section 303(a)(3) of the Help America Vote Act of 2002 (42 U.S.C. 15483(a)(3)) is amended by striking the period at the end and inserting the following: ", as certified by the Commission.".

SEC. 7. REQUIREMENT FOR MANDATORY RECOUNTS.

The Election Assistance Commission shall conduct manual mandatory surprise recounts of the voter-verified records of each election for Federal office (and, at the option of the State or jurisdiction involved, of elections for

State and local office) in .5 percent of the jurisdictions in each State and .5 percent of the overseas jurisdictions in which voter-verified records are preserved in accordance with this section immediately following each general election for Federal office, and shall promptly publish the results of those recounts. The treatment of the results of the recount shall be governed by applicable Federal, State, or local law, except that any individual who is a citizen of the jurisdiction involved may file an appeal with the Commission if the individual believes that such law does not provide a fair remedy.

SEC. 8. EFFECTIVE DATE.

Except as provided in section 3(b), the amendments made by this Act shall take effect as if included in the enactment of the Help America Vote Act of 2002.

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S 1980 IS

108th CONGRESS

1st Session

S. 1980

To amend the Help America Vote Act of 2002 to require a voter-verified permanent record or hardcopy under title III of such Act, and for other purposes.

IN THE SENATE OF THE UNITED STATES

December 9, 2003

Mr. GRAHAM of Florida introduced the following bill; which was read twice and referred to the Committee on Rules and Administration

---

A BILL

To amend the Help America Vote Act of 2002 to require a voter-verified permanent record or hardcopy under title III of such Act, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

This Act may be cited as the `Voter Confidence and Increased Accessibility Act of 2003'.

SEC. 2. EXTENSION OF TIME PROVIDED FOR STATES TO REQUEST PAYMENTS UNDER TITLE I.

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`(ii) The voting system shall provide the voter with an opportunity to correct any error made by the system before the permanent record is preserved for use in any manual audit.

`(iii) The voter verified paper record produced under subparagraph (A) and this subparagraph shall be available as an official record and shall be the official record used for any recount conducted with respect to any election in which the system is used.

`(C) SOFTWARE AND MODEMS-

`(i) No voting system shall at any time contain or use undisclosed software. Any voting system containing or using software shall disclose the source code of that software to the Commission, and the Commission shall make that source code available for inspection upon request to any citizen.

`(ii) No voting system shall contain any wireless communication device at all.

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(3) by amending subparagraph (C) to read as follows:

`(C) The equipment deployed in accordance with subparagraph (B) shall meet the voting system standards for disability access and voter-verification of results as outlined in this paragraph in accordance with the deadline set forth in section 5(a), provided that if it does not and an interim paper system is deployed in accordance with section 5(b), disabled voters shall have the option of using the interim paper system with the assistance of an aide of the voter's personal selection or using the voting system otherwise put in place for use by disabled voters at the time in question in accordance with the Help America Vote Act of 2002, as in effect prior to the enactment of this Act, except that the deadline set forth in section 301(a)(3)(C) of such Act (42 U.S.C. 15481(a)(3)(C)) is moved forward from January 1, 2007, to January 1, 2006.'; and

(4) by adding at the end the following new subparagraph:

`(D) Election officials shall be instructed in the rights of the disabled to vote with the assistance of an aide of their selection under the Voting Rights Act of 1965.'.

(c) SPECIFIC, DELINEATED REQUIREMENT OF STUDY, TESTING, AND DEVELOPMENT OF BEST PRACTICES- In addition to any other requirements under the Help America Vote Act of 2002, the Election Assistance Commission shall study, test, and develop best practices to enhance accessibility and voter-verification mechanisms for disabled voters.

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SEC. 8. EFFECTIVE DATE.

Except as provided in section 3(b), the amendments made by this Act shall take effect as if included in the enactment of the Help America Vote Act of 2002.

END

Distributed by Rep. Les Gam

Los Angeles Times
latimes.com.

http://www.latimes.com/news/local/la-me-machines10mar10,1,2347867.story?coll=la-headlines-california

THE REGION

O.C. Supervisor Wants Audit of Flawed Electronic Voting

About 7,000 voters cast ballots in wrong precincts, but officials don't believe outcomes were affected.

By Stuart Pfeifer
Times Staff Writer

March 10, 2004

An Orange County supervisor on Tuesday said he wants an investigation into last week's election, marred when poll workers using new electronic voting equipment gave thousands of voters ballots from the wrong precincts.

Supervisor Bill Campbell said he would ask the county's Internal Audit Department to review the March 2 ballot irregularities and also would welcome a probe by the county Grand Jury.

A Latino-rights organization last week also requested that the Grand Jury look into the voting problems.

A Times analysis found that about 7,000 voters cast ballots in the wrong precincts last week, affecting vote counts in many state and federal races.

"Even one error is bad. Seven thousand is terrible," Campbell said.

He said he wanted the review to search for solutions, not blame.

One solution Campbell sees is reducing the number of polling places that include multiple precincts with different ballots.

The bulk of last week's problems came when poll workers searching through a list of precinct numbers gave voters access codes for the wrong precincts.

If each polling place had only one precinct, such problems should not occur, officials said.

The irregularities did not appear to be widespread enough to jeopardize the outcome of any state or federal races. Registrar of Voters Steve Rodermund said some voters were given ballots with wrong precinct numbers, but that the ballots still displayed the correct contests.

But many other voters did cast ballots in races in which they were ineligible, The Times analysis found.

Rodermund said he would move to certify the results only if he were confident the irregular votes had not swayed the outcome.

He said he would invite the Grand Jury to review the procedures and equipment his staff used in the election.

"We would like to ask them to come and look at our processes and ask them what they think," Rodermund said.

"You always want a fresh perspective to look at what we're doing."

The civil rights advocacy group Los Amigos of Orange County suggested last week that the Grand Jury investigate.

It noted that "no one will ever know to a certainty the intent of Orange County voters as they tried to express it in a mis-administered election."

Rodermund said he and his staff hoped to estimate the number of ballots cast in improper races and report March 30 to the Board of Supervisors.

Once the election is certified, Rodermund said, the county will host a barbecue at the registrar's Santa Ana offices for all poll workers from last week's election to reward them for their service and to gather comments about the electronic voting system.

"These are the people from the trenches who rarely get the recognition that they should, so we're going to give it to them," he said.

Campbell said he wanted outside agencies to look into last week's election so the county could learn from its mistakes and prevent them from reoccurring.

"We have some very good talent in the internal audit area in looking at management systems, the way we run things," Campbell said.

"There's a lot of things we'll go back and rethink, I'm sure of that."