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Briefing

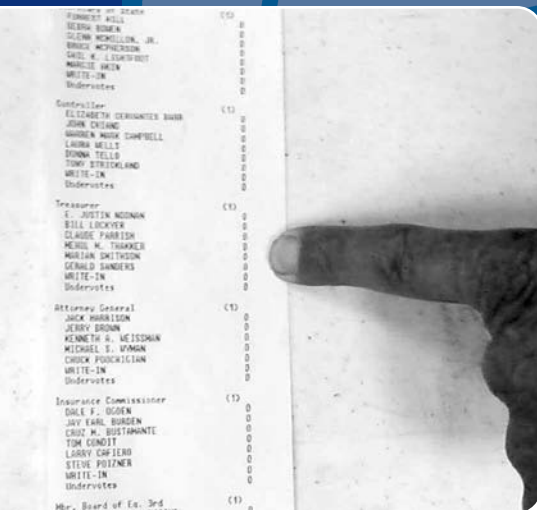


Photo courtesy Tom Courbat,
Election Defense Alliance

Case Study: Auditing the Vote

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In the five years since the passage of the Help America Vote Act, the American election process has been significantly changed with new machines, new procedures and modernized voter lists.

Still lacking, however, is the complete confidence of the voting public.

New machines are in place, but can they be trusted? Voters with disabilities can cast ballots secretly and independently, but can they verify their choices in the same fashion as everyone else?

Along with machine certification, testing and increased polling-place security, another tool to boost voter confidence is the use of post-election audits. But their use – as well as other procedures to elevate voter confidence – is disparate across the country.

While hand counts of ballots are nothing new – California has been conducting some form of machine audits since the 1960s – concerns over electronic voting technology have created a new urgency to ensure impartial verification of largely computerized voting technology.

This, the 17th *electionline Briefing*, explores the issue of post-election audits in a number of states. Like so many other issues in election

administration, the study finds that rules governing the practice vary greatly across borders as does the size of the sample, public access and scrutiny and response to disparities between vote counts and audit findings. While one state might require that 5 percent of all precincts audit ballots by hand, another might require a review of election-related procedures, including polling-place activities logged on machines, “zero tapes” from the start of the day and final tallies to make sure the counters tabulated results correctly.

Similarly, the impact of audits can vary substantially.

Nevada’s audit of voter-verified paper audit trails (VVPATs) tests to see whether machine counts of electronic ballots and manual or mechanical counts of paper records match. If they do not, the electronic count is considered the vote of record. In neighboring California, the opposite is true – the paper count takes precedence over the electronic one.

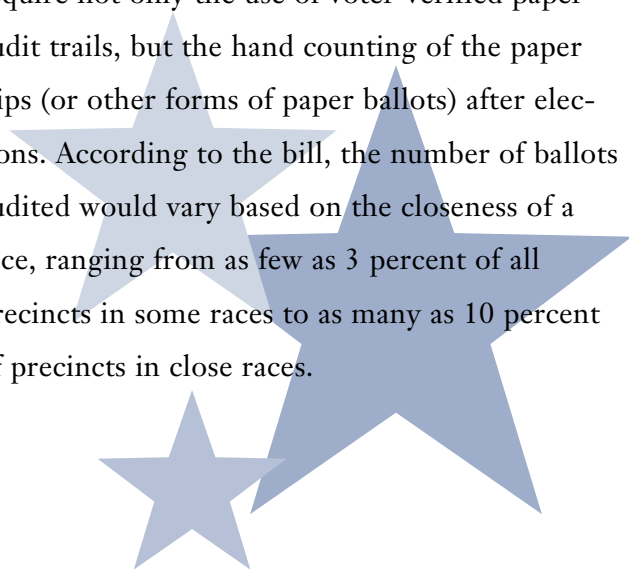
There is also a wide variety of state rules governing the extent of audits. Connecticut performed the nation’s most comprehensive post-election audit, counting 20 percent of precincts using optical-scan machines during a pilot program involving a few dozen jurisdictions. A bill pending in the legislature would make the practice state law beginning in 2008, at which time all jurisdictions will use the optical-scan systems.

Utah and California, in contrast, hand count ballots from 1 percent of voting machines and 1 percent of precincts, respectively.

And then there are consequences of discrepancies. Wisconsin makes voting system manufacturers accountable for potential machine errors. Nevada has no stated remedy for differences in machine and hand counts, while California and a number of other states mandate that, if there are discrepancies, audits are expanded.

With such a wide variety of machines in use around the country – and an entrenched tradition of state and local authority over election administration – it comes as no surprise that yet another aspect of elections finds such varied approaches across borders. But that could change soon, perhaps before Americans head to the polls in 2008.

A bill introduced by U.S. Rep. Rush Holt, D-N.J., would add significantly more uniformity to post-election auditing. If approved, it would require not only the use of voter-verified paper audit trails, but the hand counting of the paper slips (or other forms of paper ballots) after elections. According to the bill, the number of ballots audited would vary based on the closeness of a race, ranging from as few as 3 percent of all precincts in some races to as many as 10 percent of precincts in close races.



Executive Summary

The U.S. election system has been re-fitted in recent years with federal requirements for new voting systems, statewide voter registration databases, provisional ballots and other Congressionally-mandated rules.

But voter confidence remains an issue. Post-election audits, during which machine totals from electronic voting machines or optically-scanned paper ballots are hand-counted, re-checked or otherwise put under additional scrutiny are one tool increasingly being employed to assure candidates, voters and political parties of the integrity and transparency in the system.

As with many other issues in election administration, however, the ability of and interest in conducting audits varies by state. So too does the sample size, selection process and remedy in case of a discrepancy between initial totals and audit findings.

This case study examines audit rules and procedures in a number of states, focusing specifically on California, Minnesota, Nevada, Arizona and Connecticut. The five selected have contrasting state requirements and handle audits differently. In Minnesota, a “100 percent paper ballot” system allows for hand counting.

Organizations including League of Women Voters and Citizens for Election Integrity were invited to observe the process. In Arizona, current law requires audits, but only if representatives from each party are present to participate. Last year’s general election saw only five of the state’s 15 counties perform audits because of no-shows by potential auditors.

Sample sizes vary greatly as well. While California’s 42-year-old law requires audits of 1 percent of all precincts after an election, Connecticut’s pilot program of optical-scan voting systems included an audit of 20 percent of all precincts, a sample size established by academics along with state officials.

Among the case study’s other findings:

- Calls for voter-verified paper audit trails (VVPATs) have grown in state houses as well as in Congress. More than half the states now require the use of paper trails with electronic voting machines or paper-based voting systems; however, of those, only 15 require manual post-election audits. A bill under consideration in Congress (H.R. 811) would require every state to audit both VVPATs and other paper ballots after elections.
- Several states that do not require VVPATs employ their own version of post-election audits. Maryland requires an audit of election records and voting systems. Texas requires jurisdictions using paperless DRE machines to perform a hand count of ballots through an examination of ballot images.
- Florida officials conducted an audit of DRE machines following the troubled 2006 vote in Sarasota County where more than 18,000 ballots recorded no choice in a race for the U.S. House of Representatives. Critics say the re-examination of materials shed no new light on the unusually high percentage of under votes.



Key Findings

For many, the ambiguous results from Florida's 13th Congressional District in Sarasota County put on national display the problems with paperless direct-recording electronic (DRE) voting machines. The voting machines did not record more than 18,000 votes in the ultra-competitive race to replace former Secretary of State Katherine Harris, because of a machine problem, ballot design flaw, intentional under votes, or a combination of other reasons, depending upon whom is asked.

For Democrats, who took control of Congress but ultimately lost the seat in question, Sarasota's missing ballots could be the impetus necessary to compel hand-countable paper records with each vote cast on a DRE.

"The most serious problem occurred in Sarasota, Fla., where there were 18,000 under votes in the Congressional election. At this time, officials have been unable to account for what happened to these votes because there is no independent record," said Sen. Dianne Feinstein, D-Calif., during a hearing of the Senate Rules Committee to evaluate electronic voting systems.¹ A state-ordered audit – met with skepticism from some advocates – found the voting machines worked, fingering ballot-design flaws as the likely culprit.

The move toward requiring DREs to have voter-verified paper audit trails (VVPATs) has gained traction nationwide in recent months. More than half the states now require VVPATs for touch-screen voting systems or paper-based ballot sys-

tems and several more are considering the same. But state legislation might not be necessary for paper trails to become law. On Capitol Hill, nearly 200 members of Congress co-sponsored a bill that would make VVPATs mandatory nationwide.

In the quest for greater transparency through more election scrutiny, however, adding VVPATs is only one step. Some experts say counting and comparing paper audit trails or optical scan ballots to an electronic record is an essential tool.

"An independent voter-verified paper trail without an automatic routine audit is of questionable security value. By contrast, a voter-verified paper record accompanied by a solid automatic routine audit can go a long way toward making the least difficult attacks much more difficult," stated a report from the New York-based Brennan Center.²

A small but growing number of states conduct random audits of election results, with sample sizes ranging from a few precincts to a proposal that would mandate local election officials hand count ballots from one out of five precincts to ensure voting system accuracy and accountability. It would also require the audits be conducted by state auditors and not chief election officials.

Currently, more than a dozen states require post-election random manual audits. In Congress, H.R. 811 proposed by Rep. Rush Holt, D-N.J., would require both VVPATs and random audits.

While audits undoubtedly create

more responsibilities for election administrators already taxed with understanding new or recently-implemented voting systems, constantly changing polling place rules and locations and perennial shortages of poll workers, few have questioned their necessity.

In June 2006, the League of Women Voters passed a resolution endorsing the use of paper trails and mandatory audits. The resolution called for paper to be used in recounts, audited randomly in "selected precincts... in every election and the results [of the audit] published by the jurisdiction."³

R. Doug Lewis, executive director of the Houston-based Election Center, an organization representing election administrators from around the country, said in 2005 that some kind of auditability is necessary, though the list should not be limited to paper. "We recognize that transparency is needed," he told a Georgia newspaper. Forms could include a paper printout as well as an audio or video record or some other system.⁴

States with manual audit requirements

Fifteen states with paper-based ballot systems or electronic voting machines with VVPATs currently have laws or regulations requiring manual audits: Alaska, Arizona, California, Colorado, Hawaii, Illinois, Minnesota, Missouri, New Mexico, New York, North Carolina, Utah, Washington, West Virginia and Wisconsin.⁵

Connecticut does not mandate random manual audits – lever machines in place in most of the state during last year’s federal election do not allow for them – but conducted one as part of a pilot program that introduced updated voting systems in 2006. Legislation is being considered to require post-election manual audits by 2008 when optical-scan machines will have replaced lever systems statewide.

Nevada, which conducted its first audit of DRE voting machines with VVPATs in 2004, requires either a manual or mechanical audit.

The Process

States requiring audits establish a time table for completion that ranges from a few days to several weeks after an election. All require comparing a random sampling of paper ballots or VVPATs containing specified races with electronic tabulations, though the “randomness” of ballot selection has sometimes been called into question.⁶

How many ballots are audited and how to handle discrepancies between machine totals and manual count totals varies from state to state.

States generally audit either a percentage of total ballots, precincts or voting machines. Minimum requirements range from Utah’s audit of 1 percent of voting machines and 1 percent of precincts in California to 10 percent of precincts in Hawaii and 20 percent of precincts in Connecticut’s 2006 general-election audit. For more details, see the snapshot of the states on page 12.

In at least eight states, if discrep-

Seeking to avoid a vast hand-count of thousands of punch-card ballots, election workers [in Cuyahoga County, Ohio] broke state law by pre-sorting the ballots to ensure they matched the final tally.

ancies are found, audits must be expanded to include more ballots.

Other states have different options. In Wisconsin, the State Elections Board orders the voting machine vendor to investigate irregularities and can suspend use of voting systems.

“The State Elections Board (SEB) staff will request that the vendor investigate and explain the reasons for any differences between the machine tally and the paper record tally. Should the vendor fail to provide a sufficient written explanation, including recommendations for preventing future occurrences within 30 days of notification, the SEB will suspend approval of all voting systems manufactured or serviced by the vendor in Wisconsin.”⁷

Random selection of ballots

There is broad agreement among academics, policymakers, computer scientists and advocates that randomness is essential to effective audits.

The danger of non-random counts was plainly on display in Ohio three years ago.

An attempt to conduct a manual count of cherry-picked precincts in Cuyahoga County, Ohio by two election workers led to criminal convictions.

The candidate-requested recount of the 2004 presidential election was undertaken after Libertarian and Green Party Presidential candidates alleged irregularities and voter intimidation during the vote. In response, the state mandated hand counts for punch-card ballots from 3 percent of county precincts. If the hand counts did not match machine counts, then ballots from the entire county would be counted manually.⁸

Seeking to avoid a vast hand-count of thousands of punch-card ballots, election workers broke state law by pre-sorting the ballots to ensure they matched the final tally. “This recount was rigged, maybe not for political reasons, but rigged nonetheless,” said Kevin Baxter, the special prosecutor brought in from Erie County, Ohio. “They did this so they could spend a day rather than weeks or months [recounting the ballots].”⁹

Legislation

At press time, legislation had been introduced in six states to require audits: Connecticut, Florida, Indiana, Maryland, Montana and New Jersey. Legislation has also been introduced in an additional four states to change current audit rules.

In Virginia, lawmakers stripped a provision of an election bill that would have mandated audits, angering a lawmaker who lost a bid for statewide office by a razor-thin margin.

“The bill is a half measure. I’ll probably vote for it in committee, but it just makes me mad when they take the audit out. What’s the verifiable paper trail all about?” said Sen. R. Creigh Deeds, D-Bath County, who lost a bid for state attorney general in 2005 by 360 votes.¹⁰

Other audit requirements

Several states perform other types of audits, including audits of the ballots of DRE machines without paper trails and more general post-election audits of the voting system or election records.

In Texas, which has a wide variety of voting systems including paperless DREs, officials in 2006 mandated a 1 percent random audit of electronic voting systems that involved checking machine tallies against stored ballot images. The process is defined by the state as a “manual” audit.

Kentucky, which currently uses paperless touch-screen voting machines, also has an audit requirement “of randomly selected precincts representing 3 percent to 5

In Virginia, lawmakers stripped a provision of an election bill that would have mandated audits, angering a lawmaker who lost a bid for statewide office by a razor-thin margin.

percent of the total ballots cast in each election.”¹¹

Maryland, another state using all paperless DREs, requires an audit of election records and logs from individual voting machines.

“After each election, local boards of election verify that the vote totals printed from the individual voting units match the reports generated by the central tabulator.....the local boards of election also conduct a post-election audit to confirm the accuracy of the polling place reports. This includes auditing signed voter authority cards, precinct registers, other polling place forms completed by the election judges, and the official election results.”¹²

In Florida, while audits are not required, Sarasota County was ordered to perform one after a race for Congress yielded an unusually high number of under votes. The audit of the county’s paperless DRE voting machines faced criticism, partially for a lack of access to

source code and other inner workings of the voting system.

“A significant problem in the Florida case...is the inability of candidates, their representatives or members of the general public to learn anything about what might have gone on inside those voting machines,” testified Dan Wallach, associate professor of computer science at Rice University during a U.S. Senate hearing on electronic voting.¹³

ES&S, the voting machine company in question, contended this information was a trade secret and a judge ruling on a lawsuit over access to the system’s source code agreed.



California: The Quest for Audit Transparency



“I’ve gained a lot of respect for how complicated it is to do good auditing.”

—David Dill, *VerifiedVoting.org*

Nearly half a century ago, California’s legislature approved a manual count law that required the random selection of a subset of paper ballots to be counted publicly by hand in order to verify that the technology used to count the ballots was accurate and reliable.

The 1965 law calls for a public audit of 1 percent of precincts after every election. The precincts are chosen randomly by local elections officials. In addition, the law also requires that for each race not included in the initial group, one additional precinct is to be counted.¹⁴

Until 2001, California was one of only four states that required public auditing of election results.

With the introduction of direct-recording electronic (DRE) voting machines, some counties were unable to comply with the state’s manual recount law because they did not use a voter-verified paper audit trail (VVPAT). To eliminate that problem, the legislature voted unanimously to mandate VVPATs in 2004. The legislature voted again in 2005 to strengthen the manual count law by requiring the use of VVPATs.¹⁵

Observers of the audit process in California have expressed concern over how counties conduct the counts. Kim Alexander of the California Voter Foundation and David Dill, a Stanford University computer science professor, questioned the randomness of samples used for audits after noting that many counties were picking which precincts to audit several days in advance of the count.

“It does compromise the process because people know in advance what is going to be audited,” Dill said. “And that means that maybe mistakes won’t be caught if someone wanted to cheat.”¹⁶

They also stated only a few counties had written procedures for their audits. Dill and a team of researchers from ACCURATE, a multi-institution voting research center funded by the National Science Foundation, are working with election officials to come up with best practices for conducting an audit.¹⁷

After collaborating with ACCURATE during the audit of the June 2006 primary, Warren Slocum, San Mateo County’s chief elections officer, included public participation in the random selection of precincts. Slocum has a member of the public roll three 10-sided dice — red, white and blue — with one side of each die corresponding to a precinct.¹⁸

He also had a webcam installed in the room where the audit was conducted so the public could watch the manual count on the Internet.

“San Mateo is aiming for the gold standard in the manual recount process,” Slocum said. “We are establishing practices that will assure voters and election officials of the integrity of the vote.”¹⁹

Members of ACCURATE also discovered that the mandate to certify an election within 28 days complicates the audit process.

“A particular challenge for San Mateo County — and they did a good job with this — was making sure that they didn’t begin their manual audit process until all the votes were counted,” wrote Joseph Hall, Ph.D. candidate in information economics and policy at the University of California, Berkeley, in an analysis.²⁰

Elections officials and observers alike are hoping that state legislators take what was learned during the 2006 election cycle to heart and work to change and clarify some of the audit law to make the process more transparent and easier.

“I’ve gained a lot of respect for how complicated it is to do good auditing,” Dill said.²¹

Minnesota: Building an Audit Consensus

Note: The following section is a reprint from electionline Weekly, Dec. 14, 2006. Some information has been updated.

Minnesota's first-ever post-election review in November 2006 – a manual count of votes from randomly-selected precincts in the state – drew praise from two sides that do not always see eye-to-eye, election officials and advocacy groups.

“I believe that Minnesota has done a most remarkable job at making every vote count and count correctly,” said Janet Straub, a Minnesota resident and observer of the audit.²²

Secretary of State Mark Ritchie (DFL) said he was also impressed. “I am excited to hear the very positive results from our first reviews. We can all feel a great deal of confidence in our election results - and only hope that other states can catch up to our system before the 2008 elections,” he said in a press release from Citizens for Election Integrity Minnesota.²³

The law mandating the new procedure was spearheaded by state Rep. Bill Hilty, DFL-Finlayson. “We have a really good system in place in Minnesota. We have a 100 percent paper-ballot system. But even with these devices the only way to be confident in their security and reliability is to check them out,” Hilty stated.²⁴

Depending on the number of registered voters in a county, two to four precincts per jurisdiction must be randomly selected for auditing. Hilty said he hopes to fine tune the law during the current legislative session by requiring more populous counties to audit more precincts.

Presidential, gubernatorial and congressional races are examined. Local election officials and election judges perform the check, hand-counting

the paper ballots and comparing them with the optical-scan tabulation results. The comparison is required to be accurate to within one-half of 1 percent and, if it is not, more precincts are reviewed.²⁵

In many counties, precincts were selected less than a week after Election Day, with most counties performing reviews within days of the precincts' selection, generally at county courthouses.

The selection of the precincts was open to the public, as was the review. Citizens for Election Integrity Minnesota and the League of Women Voters Minnesota teamed up to organize observers in 70 of the state's 87 counties. The state has over 4,100 precincts of which a about 200 were reviewed.²⁶

“Based on reports from our observers in 70 counties, we are impressed by the accuracy of the machines that were reviewed and the professionalism of the county election officials,” Mark Halvorson, director of Citizens for Election Integrity Minnesota, stated in a press release.²⁷

Some county election officials, however, were initially skeptical of the new requirement, including Kevin Corbid, Washington County's election director.

“When the post-election audit was passed in Minnesota, I frankly was not a big proponent. Any local election official understands the enormous amount of work that is done by county auditors, county election staff, city and township staff and election judges. The idea of adding more duties was not appealing,” Corbid stated.²⁸

He added the proper testing of the

equipment before an election goes a long way to ensuring a secure and reliable vote.

The county has more than 150,000 registered voters and 87 precincts. It took just under five hours to complete the review of four precincts. Of the 12 races reviewed, seven had exact matches; four races saw one vote added each to a candidate and one race saw two votes added to a candidate.

Corbid said the discrepancies were not the result of machine error but rather how the ballots had been marked. In some cases ballots either had check marks or an “X” marked outside the oval or voters had circled the candidate's name, which could not be picked up by the optical-scan machine but was found during the manual count.

Ultimately, despite his initial concerns, he was satisfied with the review.

“I was surprised at how quickly the audit went. I was not surprised by the quality performance of the equipment and our election judges...if this is what is needed to provide some assurance to those who do not have as much confidence in the system then I have no problem continuing to do the audits,” he stated.²⁹

Anoka County, with more than 180,000 registered voters and 123 precincts, also reviewed four precincts. The process was observed by 20 people and took approximately three hours to conclude. Rachel Smith, Anoka County elections supervisor, deemed the day a success.

“I was very happy with the outcome. It was smooth and efficient,” she said. “Any way we can be proactive and people know their vote is being counted is a good thing.”³⁰

Nevada and Arizona: Challenges in Auditing

In 2004, Nevada was a trailblazer not only for the statewide use of electronic voting machines with voter-verified paper audit trails (VVPATs) but also for the decision by election officials to conduct a post-election audit of paper records to test the accuracy of voting systems.

All 17 Nevada counties conducted audits after the primary and general elections and all showed no variation between the machine records and the VVPATs.³¹ County clerks or registrars were required to audit four machines or 3 percent of machines, whichever number is greater, in counties with populations of 100,000 or fewer, 20 machines or 2 percent of machines, whichever number is greater, in counties with populations more than 100,000, resulting in an audit of 145 machines statewide after the general election. According to a press release from the secretary of state's office, not a single vote changed.³²

However, counties used different audit methods. Officials in Clark County, the state's most populous county and home to Las Vegas, compared tallies from hand-counted VVPATs with electronic results while other counties compared VVPAT totals to tallies logged by machines' internal counters.

Some counties began to consider using hand-held scanners to read barcodes printed on the VVPAT to hasten the process.

Larry Lomax, Clark County voter registrar explained that the "tedious" audit process took as long as four minutes per VVPAT.

Mistakes, he said, were common.

"Our biggest problem was human

error. Manual auditing is a boring, tedious process that takes a long time even if done without error. If one person makes one mistake on a tape, then it has to be re-audited. That occurred about a third of the time in our first attempt at manual auditing," Lomax said.³³

Meanwhile, paper-trail advocates shared concerns about using scanners for audits. "The purpose of an audit is to have an independent check. If bar-code readers are supplied by the same vendor as the rest of the voting system, it's not an independent check...Reading bar codes is not 'manual auditing' in my book," said David Dill, founder of *VerifiedVoting.org*.

Dan Burk, Washoe County voter registrar, said that the scanners would not be purchased from Sequoia, the voting machine vendor, and would be publicly tested before use in an audit.³⁴

State administrative code was changed in July 2006 to allow for the use of scanners or hand counts saying that audits "may be conducted manually or by a mechanical device" approved by the Secretary of State.³⁵

After using hand-held scanners to audit the 2006 general election, Lomax said he was pleased with their performance. "It worked great, it definitely cuts the time down astronomically and we don't have to deal with the same problem of human error this worked much better for us," he said. However, scanners may not be necessary for all counties as some have less than 1,000 voters in a given election.³⁶

Lomax said that he has had

conversations with an individual working for the National Institute for Standards and Technology regarding the scanners because the voters have only confirmed their votes on the ballot and not the bar-code that gets printed on it. However, Clark County uses open-source code to program the scanners and Lomax emphasized that voters are comfortable with electronic voting machines because they have been using them for more than 10 years.³⁷

Arizona: Seeking to Close an Audit Loophole

Arizona requires post-election audits, but with a catch.

An audit can only be performed if people show up to do it. If not, the audit is not required. And that has made post-election verification relatively rare in the state. Only five of the state's 15 counties – Gila, Maricopa, Mohave, Pima and Yuma – performed manual audits following the 2006 general election.³⁸

"Right now, two parties have to show up to do an audit...and that's not right," John Brakey of Americans United for Democracy, Integrity and Transparency in Elections – Arizona said. "If one party shows up and the other one isn't there, it's cancelled."³⁹

The state's current audit rules started with the intention to perform a more thorough count. In January 2006, a bipartisan group of lawmakers introduced S.B. 1557, legislation that would have required a post-election hand count of ballots from 5 percent of precincts.⁴⁰

Arizona Citizens for Election Reform (ACER) supported the bill

and encouraged citizens to attend related hearings.

“With increasing concern about the security of our voting machines and their effectiveness, Arizona citizens demand that our right to vote be secured and results verified. Problems with electronic voting systems have engendered a loss of public confidence in elections and prompted lawsuits which have been costly both to candidates and to taxpayers,” ACER said in a February 2006 press release prior to the hearing.⁴¹

Following that hearing, the advocacy group VoteTrustUSA reported that the state’s Senate Judiciary Committee gutted the bill, “substituting in its place a watered-down version that rendered the bill’s effort to restore confidence in Arizona’s election meaningless.”⁴²

The state Senate changed the time frame for a manual audit from seven days after all ballots have been counted to no more than 60 days after the general election.⁴³ The amended version of S.B. 1557 was signed by Gov. Janet Napolitano (D) in June 2006.⁴⁴

According to the final version, county chairs from the various political parties on the ballot must name at least three registered voters to serve as election board workers per precinct to be audited. If the board workers fail to appear and perform the hand count, the electronic tabulation is deemed the official count.⁴⁵

A bill (S.B. 1623) introduced in

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—Tom Ryan, Arizona Citizens for Fair Elections

early 2007 by state Sen. Karen Johnson, R-Mesa, would require the county elections officer to conduct a hand count regardless of whether board workers appear.⁴⁶ The measure cleared a Senate committee in February.⁴⁷

Pima County’s manual audit following the 2006 general election validated that the election’s results were within legal limits. Out of more than 15,000 ballots, the hand tally differed from the electronic tally by 47 ballots.

Brad Nelson, director of county elections, explained that the ballot counts may have not matched completely because the machines only counted ballots that were cast correctly while manual auditors counted other marks. Tom Ryan of Arizona Citizens for Fair Elections said, “The audit makes me feel better... Based on the audit that we did, I would say ‘yes,’ [the election was fair].”⁴⁸





Connecticut: Comprehensive Audits Could Expand

For more than 80 years, Connecticut election officials administered the vote on lever machines, clunky metal contraptions that while capable of producing a satisfying *ker-chunk* when the voter pulls the red bar to cast the ballot, are nonetheless incapable of allowing for a post-election audit of results. The paperless system works mechanically, using internal counters that track each vote as it is cast.

So when the state took its first steps toward replacing the lever machines by adopting a pilot project to use optical-scan systems in 25 jurisdictions statewide, a comprehensive audit program was introduced as well. After the November 2006 election concluded, ballots cast in 20 percent of precincts in jurisdictions covered by the pilot project were hand counted and compared to the totals produced by electronic counts under a project devised by the University of Connecticut's Department of Computer Sciences and the Secretary of State's office.⁴⁹

Perfect match

The pilot project involved performing a hand count of every voting machine used in 17 precincts within the 20 towns in the pilot project. In most cases, auditors found the results "matched up perfectly." When they did not, mis-marked ballots, including those with stray marks that rendered them uncountable by machines, were the culprit.⁵⁰

Secretary of State Susan Bysiewicz (D) said that the decision to audit

such a high percentage of machines when compared with audits performed in other states was the result of discussions between her office, university researchers and groups that included the League of Women Voters and TrueVoteCT, a nonpartisan organization that promotes "accessible and verifiable voting."⁵¹

"We think it's important to get a significant sample because you want people in Connecticut to be confident that our voting machines are secure and accurate," Bysiewicz said. "We had the closest congressional race in the country where [Rep. Joe Courtney, D-Conn.] won by 83 votes. Ten of 65 towns used new voting machines and in those 10 towns there were no discrepancies in the post-election audit."⁵²

Mary Mourey, Republican registrar of voters for East Hartford, oversaw one of the largest such post-election audits in the state in 2006. Her jurisdiction had three precincts to audit following the vote. Using teams of two counters – one Democrat and one Republican – more than 5,000 ballots were tallied in a single day three weeks after Election Day.

"We were very pleased, the first time doing something like this," she said. "It was a perfect match."⁵³

While she said auditing the results of the previous election did not present an unreasonable demand, a high-turnout presidential vote could prove more onerous.

Audit rules pending

But that could be the future in the Nutmeg State. After the successful

post-election audit of the pilot program in 2006, Bysiewicz introduced legislation in 2007 that would make 20 percent audits a fixture of Connecticut elections as optical-scan voting systems are implemented statewide.

The legislation would require the completion of a manual audit of 20 percent of precincts two days before the canvass for any federal or state election. Similar to the pilot program, precincts would be randomly selected for auditing.⁵⁴

While Bysiewicz acknowledged the 20 percent figure represented a potentially large pool of ballots, she said it was a worthwhile endeavor.

"We understand that there are other pieces of legislation pending in Congress and in other states that would have a much smaller requirement, but we decided to go with the 20 percent because that's what we did for the audit for the first 20 towns," she said. "We think it's important to get a significant sample because you want people in Connecticut to be confident that our voting machines are secure and accurate."

"There may be some who say that's too much work, but I would argue the voter confidence is very important, particularly in the first year we use these machines," she added.⁵⁵

Some advocates have raised issue with the broad discretion afforded to the Secretary of State in the event of a discrepancy discovered during auditing, as well as the timetable for conducting the post-election counts, arguing it would be too late for candidates to act on information gleaned from the process.

SNAPSHOT OF THE STATES:

Audit Requirements

The following states require a post-election manual audit of ballots, a post-election mechanical audit of ballots, a post-election audit of election records and/or a post-election audit of voting systems. States without audit rules were not included.

Alaska

Audit type: Hand ballot count

Who conducts review: Local election official with the assistance of appointed representatives from the political parties.⁵⁶

Timing: Begins as soon as practicable after the election but no later than 16 days after an election.⁵⁷

Audit scope: One randomly selected precinct in each election district that accounts for at least 5 percent of the ballots cast in that district.⁵⁸

Remedy for potential discrepancies: If there is a discrepancy of more than 1 percent between the results of the hand count and the certified count, the director will conduct a hand count of the ballots from that district. If there is an unexplained discrepancy in the ballot count in any precinct, the director may count [additional] ballots from that precinct.⁵⁹

Arizona

Audit type: Hand ballot count

Who conducts review: The county election officer and county political party chairs or person designated conduct the selection of precincts. The county party chairs designate at least three board workers to perform the hand count. If the board workers fail to appear, no hand count is conducted.⁶⁰

Timing: Precinct selection begins after all ballots have been delivered to the central counting center. The unofficial vote totals from all precincts are made public before selecting the precincts to be hand counted.⁶¹ Hand counts begin within 24 hours after the closing of the polls and are completed before the canvassing of the election.⁶²

Audit scope: At least 2 percent of the precincts in the county, or two precincts, whichever is greater. At least four contested races, including one federal race, one statewide candidate race, one ballot measure and one legislative race on those ballots shall be counted. During presidential elections, the presidential race is also counted.⁶³

Remedy for potential discrepancies: If there are discrepancies between the two counts greater than the designated margin, a second hand count is performed. If the second hand count still has a difference greater than the designated margin, the hand count is expanded to include a total of twice the original number of randomly selected precincts.⁶⁴

California

Audit type: Hand ballot count

Who conducts review: Local election official⁶⁵

Timing: Conducted during the official canvass.⁶⁶ The process is open to the public.⁶⁷

Audit scope: At least 1 percent of randomly selected precincts. If 1 percent of the precincts is less than one whole precinct, the count will be conducted in one precinct chosen at random by the elections official. For each race not included in the initial group of precincts, one additional precinct will be counted. Additional precincts are selected at the discretion of the election official.⁶⁸

Remedy for potential discrepancies: A report on the results will identify discrepancies between the machine count and the manual tally and describe how the discrepancies were resolved. The VVPAT governs if there is a discrepancy between it and the electronic record.⁶⁹

Colorado

Audit type: Hand ballot count

Who conducts review: The Secretary of State initiates the manual random audit to be conducted by each county.⁷⁰ The audit is observed by at least two members of the canvass board of the county.⁷¹

The designated election official can appoint additional deputized clerks to assist.⁷²

Timing: Within 24 hours of polls closing, the Secretary of State notifies election officials which voting devices and which races have been selected for auditing.⁷³

Audit scope: A random selection of 5 percent of precinct scanner-based equipment, at least one central count scanner/vote center and 5 percent of direct-recording electronic (DRE) voting systems.⁷⁴

Remedy for potential discrepancies: If there is any discrepancy which cannot be accounted for by voter error, the county clerk and recorder investigates and takes such remedial action as necessary.⁷⁵

Connecticut⁷⁶

Audit type: Hand ballot count⁷⁷

Who conducts review: The 2006 audit was performed by the Office of the Secretary of State with the assistance of the University of Connecticut's Department of Computer Sciences. Officials from the League of Women Voters randomly chose the precincts.⁷⁸

Timing: The audit was performed during the final week of November.⁷⁹

Audit scope: Ballots were reviewed in 17 precincts, representing 20 percent of the 87 polling precincts in the 15 cities and towns which used optical-scan technology in the 1st, 3rd, 4th, and 5th Congressional districts.⁸⁰

Remedy for potential discrepancies: In the majority of the precincts, the counts matched and in those where the results did not match, there were only minor changes reported. In each instance, the change was due to a mismarked ballot, not to machine error.⁸¹

Florida

Audit type: Non-mandatory audit of voting system, including checks against "unauthorized manipulation and fraud."

Timing: At any time the Department of State can review the voting system of any county to ensure compliance with the Electronic Voting Systems Act.⁸² If directed, the legislature can also provide for an independent audit of a voting system in any county. It shall consist of a study and evaluation of the voting system and provide reasonable assurance that the system is properly controlled, can accurately count votes, provides adequate safeguards against unauthorized manipulation and fraud, and complies with the requirements of law and rules of the Department of State.⁸³

Hawai'i

Audit type: Hand ballot count

Who conducts review: The local chief election officer⁸⁴

Timing: Prior to certification of election results.⁸⁵

Audit scope: A random sample of not less than 10 percent of the precincts employing the electronic voting system.⁸⁶

Remedy for potential discrepancies: If discrepancies appear, the chief election officer immediately conducts an expanded audit to determine the extent of misreporting in the system.⁸⁷

Illinois

Audit type: Hand ballot count

Who conducts review: The local chief election officer. The state central committee chair of each party can be represented at the procedure.⁸⁸

Timing: After Election Day and before election results are declared.⁸⁹

Audit scope: 5 percent of precincts.⁹⁰

Remedy for potential discrepancies: The election authority immediately forwards a written report to the appropriate canvassing board explaining the results of the test and any errors encountered and the report shall be made available for public inspection.⁹¹

Kentucky

Audit type: Hand ballot count

Who conducts review: The state board of elections prescribes rules and regulations.⁹²

Timing: As part of the official canvass.⁹³

Audit scope: Random selection of between 3 and 5 percent of total ballots cast.⁹⁴

Remedy for potential discrepancies: Not specified

Maryland

Audit type: Election records, including signed voter authority cards, precinct registers, other polling place forms completed by the election judges and the official election results.

Who conducts review: Local boards of election.

Audit scope: Vote totals are verified by comparing printed forms from individual voting units to reports generated by the central tabulator.

Remedy for potential discrepancies: The local board continues its audit until it determines the cause of the discrepancy.⁹⁵

Minnesota

Audit type: Hand ballot count

Who conducts review: The county canvassing board appoints a post-election review official who can be assisted by election judges. The review is conducted in public.⁹⁶

Timing: At the canvass of the state primary, the county canvassing board sets the date, time and place for the post-election review of the general election. At the canvass of the state general election, county canvassing boards select the precincts to be reviewed.⁹⁷

Audit scope: Counties with fewer than 50,000 registered voters must review at least two precincts. Counties with

between 50,000 and 100,000 registered voters must review at least three precincts. Counties with over 100,000 registered voters must review at least four precincts. At least one precinct selected in each county must have had more than 150 votes cast at the general election.⁹⁸ The post-election review must be conducted of the votes cast for President or Governor; U.S. Senator; and U.S. Representative.⁹⁹

Remedy for potential discrepancies: If the review reveals a difference greater than one-half of 1 percent, within two days there will be an additional review of at least three precincts. If the second review also shows a difference greater than one-half of 1 percent, a review of the ballots from all the remaining precincts in the county must be performed. If the results from the county reviews from one or more counties comprising more than 10 percent of the total number of persons voting indicate an error in counting has occurred, a manual recount of all ballots in the district for the affected office must be performed.¹⁰⁰

Missouri

Audit type: Hand ballot count

Who conducts review: The county election authority selects at least one team made up of at least two members.¹⁰¹

Timing: After the mandated electronic recount and prior to the certification of election results.¹⁰²

Audit Scope: At least one precinct for every 100 election precincts. One contested race is selected from the following categories: President, U.S. Senate and statewide candidates; statewide ballot issues; U.S. Representative candidates and state General Assembly candidates; partisan circuit and associate circuit judge candidates and all nonpartisan judicial retention candidates; and in addition not less than three contested races or ballot issues from all political subdivisions and special districts, including the county, in the selected precinct(s). When there are three or fewer contested races or ballot issues within this category at a selected precinct, all must be counted.¹⁰³

Remedy for potential discrepancies: Not specified

Nevada

Audit type: Hand ballot count or mechanical audit (including bar-code scanners for voter-verified paper audit trails).

Who conducts review: County clerk.¹⁰⁴ The public can observe.¹⁰⁵

Timing: The results of the audit must be sent to the Secretary of State within seven working days after the election.¹⁰⁶

Audit scope: Counties whose population is 100,000 or more must audit 2 percent of voting machines used in the election or no less than 20 voting machines, whichever is greater. Counties whose population is less than 100,000 must audit 3 percent of voting machines used in the election or no less than four voting machines, whichever is greater.¹⁰⁷ The comparison may be conducted manually or by a mechanical device determined by the Secretary of State to be capable of accurately reading the votes cast.¹⁰⁸

Remedy for potential discrepancies: Not specified.

New Mexico

Audit type: Hand ballot count

Who conducts review: The Secretary of State directs county clerks. Canvass observers are allowed.¹⁰⁹

Timing: Within five days of the completion of the county canvass.¹¹⁰

Audit scope: For votes in the general election for the office of President or Governor, 2 percent of the voting systems in the state are compared with votes tallied by hand from the voter-verifiable and auditable paper trail from those voting systems.¹¹¹

Remedy for potential discrepancies: For voting machines not used for absentee voting, if totals differ by more than 1.5 percent, a recount is conducted for the office in the precincts of the legislative district where the discrepancy occurred.¹¹²

New York

Audit type: Hand ballot count

Who conducts review: The board of elections or a bipartisan committee appointed by the board.¹¹³

Timing: Within 15 days after each general or special election and within seven days after every primary or village election conducted by the board of elections.¹¹⁴

Audit scope: At least 3 percent of voting systems within the jurisdiction.¹¹⁵

Remedy for potential discrepancies: Standards created by the Board of Elections will determine when a discrepancy between the manual audit tallies and the voting system tallies requires an audit of additional voting systems.¹¹⁶ Any board of elections shall be empowered to order any such audit to be conducted whenever such discrepancy exists.¹¹⁷

North Carolina

Audit type: Hand ballot count

Who conducts review: The State Board of Elections creates the procedure for randomly selecting the precincts for each election.¹¹⁸

Timing: The selection of precincts is done after the initial count of election returns is publicly released or 24 hours after the polls close on Election Day, whichever is earlier.¹¹⁹

Audit scope: The sample chosen by the state board is of one or more full precincts, full counts of mailed absentee ballots, full counts of one or more one-stop early voting sites, or a combination. The size of the sample of each category is chosen to produce a statistically significant result in consultation with a statistician.¹²⁰

Remedy for potential discrepancies: If the discrepancy between the manual count and the mechanical or electronic count is significant, a complete manual count is conducted.¹²¹

Oregon:

Audit type: Audit of voting system. Not mandatory. Any voting machine or vote tally system involving the use of computers, a computer network, computer program, computer software or computer system is subject to audit by the Secretary of State at any time for the purpose of checking the system's accuracy.¹²²

Pennsylvania

Audit type: Not specified

Who conducts review: County boards of election¹²³

Timing: As part of the canvass of returns.¹²⁴

Audit scope: A statistical recount of a random sample of ballots after each election. The sample shall include at least 2 percent of the votes cast or 2,000 votes, whichever is lesser.¹²⁵

Remedy for potential discrepancies: Not specified

Texas

Audit type: Hand count of ballot images

Who conducts review: The general custodian of election records who conducts an election in which a DRE is used for the first time. Candidates are entitled to be present and have a representative present. The designated election official can appoint additional deputized clerks to assist.¹²⁶

Timing: The manual count begins within 72 hours after the close of polls.¹²⁷

Audit scope: A manual count in 1 percent of the election precincts or three election precincts, whichever is greater. For DRE devices the appropriate official will print the cast vote records (ballot images) and manually count the race assigned and verify the manual count matches the election results.¹²⁸

Remedy for potential discrepancies: If there are discrepancies, the election official continues the audit until it determines the cause of the discrepancy. If the discrepancy can not be resolved, the Secretary of State's office is notified.¹²⁹

Utah

Audit type: Hand ballot count

Who conducts review: Local election officials¹³⁰

Timing: After polls close on Election Day but no later than noon the next day, the Lieutenant Governor's (chief election officer) office notifies the appropriate election officers which voting machines will be audited. The machines are audited between the closing of polls and the meeting of the jurisdictions' board of canvassers.¹³¹

Audit scope: 1 percent of the total number of AccuVote TSx and precinct count AccuVote OS voting machines in use statewide.¹³²

Remedy for potential discrepancies: The reasons for any differences between the hand count and the machine total report results are recorded in a log.¹³³

Washington

Audit type: Hand ballot count required for some, not all, of ballots selected for review

Who conducts review: County auditor. Political party representatives must be allowed to observe if representatives have been appointed and are present at the time of the audit.¹³⁴

Timing: Prior to certification of the election.¹³⁵

Audit scope: Random selection of up to 4 percent of the DRE devices or one DRE device, whichever is greater. On one-fourth of the devices, the paper records must be tabulated manually. For the remaining devices, the paper records may be tabulated by a mechanical device determined by the secretary of state to be capable of accurately reading the votes cast and printed.¹³⁶

Remedy for potential discrepancies: The paper record produced must be stored and maintained for use in the random audit of results. When such paper record is for an audit it shall be the official record of the election.¹³⁷

West Virginia

Audit type: Hand ballot count

Who conducts review: Board of canvassers¹³⁸

Timing: During the canvass.¹³⁹

Audit scope: At least 5 percent of the precincts chosen at random will have the VVPATs counted manually.¹⁴⁰

Remedy for potential discrepancies: If the manual count differs by more than 1 percent from the automated tabulation equipment results or there is a different prevailing candidate or outcome of a ballot issue, the discrepancies are disclosed to the public and all VVPATs are manually counted.¹⁴¹

Wisconsin

Audit type: Hand ballot count

Who conducts review: The audit consists of two independent processes: an audit conducted by municipalities of reporting units randomly selected by the State Elections Board (SEB) and an audit of reporting units conducted by the SEB. The audit is open to the public.¹⁴²

Timing: Audits are only conducted after the November general election. Officials are notified the day after the election of the voting systems selected for the audit. The audit must be conducted no later than two weeks after the county board of canvassers certifies the election results.¹⁴³

Audit scope: The SEB will randomly select 50 reporting units across the state, including a minimum of five reporting units for each voting system used in the state. A minimum of four contests are audited, including the top candidate race on the ballot. The other contests are selected randomly but must appear on every ballot in the state. The SEB may also audit additional contests.¹⁴⁴

Remedy for potential discrepancies: If the hand counts and vote tallies do not match, the results are double-checked. If they still do not match, the difference is noted on the appropriate form. The SEB will request the vendor investigate and explain the reasons for any differences between the machine tally and the paper record tally. If the vendor fails to provide a sufficient explanation the SEB will suspend approval of all voting systems manufactured or serviced by the vendor.¹⁴⁵



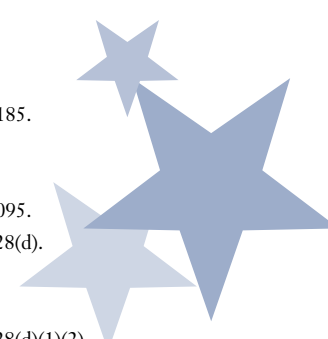
Methodology/Endnotes

Research was compiled through the use of primary and secondary sources, including interviews with state and local election officials, data derived from state law, state election division Web sites, news accounts and information provided by other non-governmental organizations.

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electionline.org

Briefing

electionline.org, administered by the Election Reform Information Project, is the nation's only nonpartisan, non-advocacy website providing up-to-the-minute news and analysis on election reform.

After the November 2000 election brought the shortcomings of the American electoral system to the public's attention, The Pew Charitable Trusts made a grant to the University of Richmond to establish a clearinghouse for election reform information.

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