Understanding Risk Limiting Audits

What is a risk limiting audit?

A "risk limiting audit" is an audit of an election contest that provides strong statistical evidence that the election outcome is right. Importantly, a risk limiting audit has a high probability of correcting a wrong outcome.

Risk-limiting audits demand that close races get more scrutiny. If the margin of victory is very close, even one faulty scanner could alter the outcome of the election and so a risk-limiting audit requires examining a larger sample of ballots. If the margin of victory is wide, fewer ballots need to be reviewed to ensure with high confidence that the outcome is correct—assuming that the audit does not uncover problems.

What actually is the risk limit? What does it mean?

The risk limit is the largest chance that an incorrect outcome escapes correction. Example: If the risk limit is 1%, then, in the long run at least 99 out of 100 wrong outcomes would be corrected by the audit.

Q. What is a post-election audit?

A. A post election audit is a check on the election process. Good post-election audits check the machine results by inspecting some of the paper ballots manually. Well designed and executed audits can catch and correct errors that change the outcome—that made someone other than the true winner appear to win.

Q. How do conventional post-election audits work?

A. Election officials sample a percentage of the ballots, typically by choosing machines or precincts at random. They tally the ballots manually and compare the results to the reported results. Generally, they stop there.

Q. Why do we need a post-election audit?

A. In order for our democracy to function, we have to have a voting process that deserves our trust. Unfortunately, computer errors and human errors can produce significant miscounts. There have been elections in which the wrong candidate has been declared the winner because of a simple "software glitch" or programming error.

Q. What is an example where a reported election outcome was wrong?

A. In a municipal election in Palm Beach County, Florida in March 2012, a "synchronization" problem with the election management software allotted votes to both the wrong candidate and the wrong contest. The error was caught in a post-election audit and the results were officially changed after a court-sanctioned public hand count of the votes.[1]

Q. **Do clerks in Colorado conduct post-election audits?**

A. Yes. Every race in every election in all counties undergoes what Colorado statute **C.R.S. 1-7-514** refers to as a post-election audit.

Q. How does it work now?

A. Counties in Colorado have been required to use a fixed-percent post-election recount process capped at 500 ballots. The Secretary of State's office randomly selects 5 percent of ballot scanners and 5 percent of direct record electronic voting machines[2] (where voters use a touch screen or dial to mark ballots instead of a pen). Each selected system is assigned to a portion of all contests. A <u>manual</u> inspection and tally of the voter-marked ballots and voter verified paper records from the DRE touch screen/dial voting machines is compared to the results reported after a new count is obtained from the selected scanners and DREs.

Q. What's changing?

A. In 2009, the Colorado General Assembly passed a law requiring counties to conduct a different type of post-election audit—a risk-limiting audit (RLA) on races selected by the Secretary of State in accordance with procedures set by the Secretary of State. Unlike current law, the risk-limiting audit uses statistical tools to give a large, pre-specified chance (say 90 percent or 99 percent) of correcting any erroneous election outcome.

Q. How will Colorado's election system be improved by using a risk-limiting audit?

A. Colorado's current election system will be improved by shifting the focus from auditing the <u>machines</u> to auditing the election <u>outcomes.</u> A truly robust post-election audit should check whether the **<u>outcome</u>** of the election is correct. Colorado's auditing practices will be improved by shifting to an audit methodology that <u>checks election outcomes</u> and also <u>corrects outcomes</u> if they are wrong.

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[1] Jaikumar Vijayan, E-voting System Awards Election to Wrong Candidates in Florida Village. Computerworld (April 4, 2012)

[2] State of Colorado Risk-Limiting Audit –Final Report : Post-Election Audit Initiative – Grant no. EAC 11150E p.3