



FOR IMMEDIATE RELEASE

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WHO: *Utah Count Votes*

WHAT: Response to Utah Lt. Governor's 1% Vote Count Audit Policy

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**MATHEMATICIANS SAY THAT UTAH'S 1% VOTE COUNT AUDIT IS INSUFFICIENT TO DETECT OUTCOME-ALTERING VOTE FRAUD OR ERROR**

**SUMMARY:** Mathematicians Agree That Utah's 1% Vote Count Audit Will Not Assure Election Integrity.

According to an August Nexis entry, the Utah Lt. Governor's Office announced that it plans to select "approximately 1 percent" of precincts for audits "to verify the votes of the state's electronic voting machines"

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Lt. Gov. Gary Herbert is organizing an audit committee to verify the votes of the state's electronic voting machines. Though Utah uses some machines that produce paper receipts, the machines are still vulnerable to attacks that can manipulate votes. An audit would compare the votes on the machines with the paper trail and select approximately 1 percent of precincts.

C&E Staff  
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Kathy Dopp, President of Utah-based National Election Data Archive, a group of researchers devoted to vote count accuracy, says that mathematicians agree that a 1% manual check of precinct electronic vote counts is insufficient to verify the accuracy of electronic vote counts in close races.

A 1% audit rate was mathematically shown to be inadequate to detect outcome-altering vote miscount as early as 1975 by Roy Saltman of the Information Technology Division of the National Bureau of Standards (in a study, NBSIR 75-687, paid for by the US GAO).<sup>1</sup>

Total Number of Vote Counts	Hypothetical Number of Corrupt Vote Counts	Percent of Corrupt Vote Counts	Number of Audited Vote Counts for 1% Audit	Expected Value of Corrupt Counts in Audit	Standard Deviation	Probability of Finding a Corrupt Vote Count
440	220	50.00%	5	2.50	1.12	96.95%
440	198	45.00%	5	2.25	1.11	95.06%
440	176	40.00%	5	2.00	1.10	92.34%
440	154	35.00%	5	1.75	1.07	88.54%
440	132	30.00%	5	1.50	1.02	83.36%
440	110	25.00%	5	1.25	0.97	76.45%
440	88	20.00%	5	1.00	0.89	67.42%
440	66	15.00%	5	0.75	0.80	55.81%
440	44	10.00%	5	0.50	0.67	41.10%
440	22	5.00%	5	0.25	0.49	22.72%
440	18	4.00%	5	0.20	0.44	18.93%
440	14	3.00%	5	0.15	0.38	14.99%
440	5	1.00%	5	0.05	0.22	5.58%
440	3	0.50%	5	0.03	0.16	3.38%
440	1	0.10%	5	0.01	0.07	1.14%
440	1	0.05%	5	0.00	0.05	1.14%

The chart on the left shows the probabilities (rightmost column) for a 1% audit to detect one or more corrupt vote counts for various rates of corruption in a typical U.S. Congressional race.

A 1% audit would be unlikely to detect the amount of vote miscount that could wrongly alter close races where margins between candidates are less than 10%. In races involving fewer precincts, the probability of detection is even lower.

The amount of precincts audited must be increased to detect smaller error as margins between candidates decrease.

<sup>1</sup> The mathematics of calculating vote count audit size is explained in "How Can Independent Paper Audits Detect and Correct Vote Miscounts?" [http://uscountvotes.org/ucvAnalysis/US/paper-audits/Paper\\_Audits.pdf](http://uscountvotes.org/ucvAnalysis/US/paper-audits/Paper_Audits.pdf)