House Bill 1172

Election Law – Postelection Tabulation Audits – Risk–Limiting Audits
SUPPORT

Ways and Means
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I am a Professor of Computer Science at The George Washington University. My research of the last fifteen years has been in the general area of computer security and privacy, with a special emphasis on the integrity of electronic voting systems. My qualifications and complete CV, as well as more details about my work, may be found on my website[1]. I have provided written and oral testimony to Committees of the Maryland Legislature on several Bills and have also provided oral and written testimony to the State Board of Elections[2].

I STRONGLY SUPPORT THIS BILL.

The literature in the field of election security is clear, unequivocal and non-partisan: computerized election systems present multiple opportunities for intentional alteration of election outcomes and are also vulnerable to error. This assessment applies to the optical scan voting systems used in Maryland and includes voting machines that are not on the internet. Experts recommend that, in addition to making every attempt to secure the voting systems used, an independent, public, risk-limiting audit[3] of the voter-verified paper ballots should be performed after every election to verify that the election outcome correctly represents the voter-verified evidence[4]. An election should be certified only after it passes the audit.

This Bill has several valuable features: it requires a risk-limiting audit of at least one statewide contest following each statewide election, performed through the manual examination of

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[1] http://www.seas.gwu.edu/~poorvi/

[2] https://www2.seas.gwu.edu/~poorvi/MarylandAudits/

[3] Post-election audits of both the election outcome and the election technology are recommended by the Presidential Commission on Election Administration, see: "The American Voting Experience: Report and Recommendations of the Presidential Commission on Election Administration", January 2014, pg 66, https://law.stanford.edu/wp-content/uploads/sites/default/files/publication/466754/doc/slspublic/Amer%20Voting%20Exper-final%20draft%2001-04-14-1.pdf and "Report on Election Auditing" by the Election Audits Task Force of the League of Women Voters of the United States, January 2009, http://lwv.org/files/Report_ElectionAudits.pdf

[4] P.B. Stark and D.A. Wagner, "Evidence Based Elections", IEEE Security and Privacy, special issue on electronic voting, 2012. www.stat.berkeley.edu/%7Estark/Preprints/evidenceVote12.pdf

randomly-chosen individual paper ballots or batches of paper ballots. It also requires that the audit be completed before certification and that an election outcome found to be incorrect by the audit should be corrected, and that the audit be transparent, both in process and in the prompt and detailed announcement of its results.

Friendly suggestions are as follow:

- **Section I, (C), 2:**

  MANUALLY EXAMINE RANDOMLY CHOSEN INDIVIDUAL VOTER–VERIFIABLE PAPER RECORDS OR BATCHES OF VOTER–VERIFIABLE PAPER RECORDS UNTIL THERE IS SUFFICIENTLY STRONG STATISTICAL EVIDENCE THAT A FULL MANUAL COUNT OF THE AUDITED CONTEST WOULD CONFIRM THE ELECTRONIC COUNT, OR UNTIL THERE HAS BEEN A FULL MANUAL COUNT;

  Risk-limiting audits do not attempt to check or correct electronic counts; the goal is simply to check the outcome. An audit might unearth evidence that the electronic count is incorrect, but small errors in electronic counts would not result in a full manual count. I urge you to replace **ELECTRONIC COUNT** by **OFFICIAL OUTCOME**.

- **Section I, (C), 3:**

  IF A RISK–LIMITING AUDIT FINDS THAT THE ELECTRONIC COUNT IS INCORRECT, THE OFFICIAL RESULT OF THE ELECTION SHALL BE ALTERED TO MATCH THE RESULT FOUND BY THE RISK–LIMITING AUDIT.

  Note here that if, for example, the audit finds that counts of specific batches of ballots have been incorrectly recorded, the corresponding official counts would be corrected. However, the errors detected may not be large enough to warrant a manual hand count; in such cases the detected errors would not lead to a change in the official outcome, merely to changes in specific batch counts and any resulting change in overall counts. I suggest you replace **THE OFFICIAL RESULT OF THE ELECTION SHALL BE ALTERED TO MATCH THE RESULT FOUND BY THE RISK–LIMITING AUDIT** to **THE CORRESPONDING OFFICIAL ELECTRONIC COUNT OF THE ELECTION SHALL BE ALTERED TO MATCH THE COUNT FOUND BY THE RISK–LIMITING AUDIT**

- **Paper ballots should be drawn from all categories of ballots:** The Bill should include text requiring that ballots are drawn from in person, absentee, provisional and early votes, and that the original voted paper ballots should be examined for in person and absentee voters (in particular hand-transcribed absentee ballots should not replace voter-verified absentee ballots during the audit). The vote itself (not the bar code) should be read for ballots generated by the Express Vote machines.

- **Risk-Limiting Audits Workgroup**: The Bill requires the formation of a Risk-Limiting Audits Workgroup to guide the state in its processes. In addition to what is in the Bill, the work group could be charged with designing compliance audits that ensure the security of the evidence trail of the paper ballots (and, to the extent possible, the electronic images used in the electronic audit). I believe that Maryland already does have some compliance audits in place, so these could be enhanced if necessary.

As in the past, I will be happy to help Maryland design and implement the audits. Please do not hesitate to ask. I congratulate the committee on a strong bill that serves the interests of Maryland's voters.

Respectfully,

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Note: affiliations are included for identification only

Poorvi L. Vora is Professor of Computer Science at The George Washington University. Her research focus has been on end-to-end independently verifiable (E2E) voting systems. She was a member of the team that deployed E2E voting system Scantegrity II in the Takoma Park elections of 2009 and 2011. She has worked with the National Institute of Standards and Technology (NIST) on definitions of desired properties of E2E systems, and on information-- theoretic models and measures of voting system security properties. She obtained her Ph.D. from North Carolina State University.