

## **S. 3212: A Step Backward for Voting System Transparency**

On June 26, 2008, Senator Dianne Feinstein (D-CA) and Senator Robert Bennett (R-UT) introduced the Bipartisan Electronic Voting Reform Act (S. 3212). The [press release](#) accompanying the introduction of S. 3212 observes “the ability to ensure there is an accurate, reliable and transparent method for Americans to cast and count votes is fundamental to our democratic process.” Unfortunately, S.3212 falls far short of ensuring accuracy, reliability, and transparency in our elections and is likely to do more harm than good.

The bill contains some generally commendable provisions relating to election security (Section 4), voting system testing and certification (Section 5), and ballot layout design (Section 10), but the positive aspects of these provisions are outweighed by the problems created by many of the other sections of this bill. Despite its worthy motivations, the bill fails to carry out its objective.

A number of troubling provisions require us to urge opposition to S. 3212:

1. S.3212 allows “independent” vote records that would exist only in computer memory to be used to verify electronic vote totals.
2. The non-paper verification methods allowed by S. 3212 would increase the costs and burdens of conducting elections without the benefit of increased confidence and auditability.
3. Language in the bill would exempt from any verification requirement those paperless voting systems purchased before January 1, 2009 to meet HAVA's accessibility requirements. This would leave millions of voters (particularly those with disabilities) dependent on insecure paperless electronic machines for the foreseeable future.
4. S. 3212 is opaque and disturbingly open to interpretation on a critical question: would the bill require that it be the voter that verifies the contents of the independent record?
5. S. 3212 would not define the legal status of the independent record in the event of a discrepancy in vote tallies.
6. The bill would not require states to use the independent records in post-election audits.
7. S. 3212 would not require the EAC to adopt model audit guidelines for jurisdictions that use paper ballot optical scan technology (now the most common voting system in the United States) nor would it require optical scan paper ballots to be utilized in any audits conducted in those jurisdictions.
8. S. 3212 is unclear regarding how its requirements would apply to accessible ballot marking devices.
9. S. 3212 could restrict the publication of valuable information about the security and reliability of voting systems.

10. S. 3212 would place a representative of the voting system manufacturing industry on the committee that drafts federal voluntary voting system guidelines.

**1. S. 3212 allows “independent” vote records that would exist only in computer memory to be used to verify electronic vote totals.** S. 3212 would allow electronic records to serve as so-called “independent” vote records. The use of electronic records to verify electronic vote totals would leave elections vulnerable to malfunctioning or malicious software and do nothing to ensure voter confidence in those electronic vote totals.

To be meaningful for audits or recounts of electronically tallied votes, an independent record must be presented to the voter for verification before the ballot is cast, and must not be alterable by failure or manipulation of software. The principle that a failure of software should not cause an undetectable error in the outcome of an election is known as “software independence.” Computer scientists recognized as leaders in the field of security have called for software independence to be established as a fundamental standard for voting systems.<sup>1</sup>

Last year, Prof. Edward Felten, Director of the Center for Information Technology Policy at Princeton University, offered eloquent testimony to Congress in support of software independence, observing that computer scientists have not yet found a way to guarantee the correctness of software:

*“Our election system must be software independent, meaning that its accuracy cannot rely on the correct functioning of any software system. Thus far, computer scientists have not found a way to ensure the correctness of useful software programs. It is unclear in general whether this is even possible. Instead of pretending we are able to ensure correctness of software, we must have a system that records and counts the votes accurately even if the software malfunctions.”<sup>2</sup>*

Adding “independent” records that themselves depend on software is likely to reduce the trustworthiness of electronic voting machines, not increase it. There are no current or proposed standards at the Federal level that can be used to determine whether such an “independent verification” method is secure, nor is there any certification process in place that can determine whether a new independent verification method is trustworthy.

Electronic verification is unlikely to restore confidence to voters who are concerned about the integrity of computer voting technology, especially if it requires a sophisticated understanding of software. By contrast, a strong chain of custody for paper ballots and the practice of random hand-counted audits of those paper ballots to verify electronic ballot tallies are effective procedures all voters can understand and trust.

We share our strong support for a physical, tangible record of cast votes with the world’s oldest educational and scientific computing society, the Association for Computing Machinery, whose statement on electronic voting reads:

*“Voting systems should also enable each voter to inspect a physical (e.g., paper) record to verify that his or her vote has been accurately cast and to serve as an independent check on the result produced and stored by the system. Making those records permanent (i.e., not based solely in computer memory) provides a means by which an accurate recount may be conducted.”<sup>3</sup>*

By allowing electronic records to serve as “independent” records, S. 3212 would result in an irresponsible waste of taxpayer dollars on voting systems that would be just as opaque and unverifiable as existing paperless electronic voting machines.

**2. The non-paper verification methods allowed by S. 3212 would increase the burden of conducting elections without the benefit of increased confidence and auditability.** The bill allows the use of the following “verification records”: a paper record, an electronic record, an audio record, a video record, a pictorial record<sup>4</sup>, or an “other” independently produced record.

S. 3212 would spend taxpayer dollars for the development of new “independent” verification schemes, even as states move toward voter-verified paper ballots in increasing numbers.

The lack of significant market demand for non-paper verification stands in sharp contrast to the strong market demand for accessible ballot-marking devices compatible with paper ballot/optical scan voting systems. When the Help America Vote Act established the requirement for at least one accessible voting device in each polling place, many jurisdictions which use paper ballot/optical scan systems wanted to keep their optical scan equipment. Accessible ballot marking devices, without special federal funding, were developed, and now are in use in 31 states. Having made their simple, independently auditable paper ballot systems accessible, these states are not now looking for greater costs, more complexity and further disruptions to the process. One state even developed an accessible alternative format ballot (AFB)<sup>5</sup> which expands the accessibility of their paper ballot system, while also providing for accessible verification. They didn’t need S. 3212 to accomplish this.

The proposed paperless verification technologies would do little to improve election integrity. Voter verifiable paper ballots have proven practical in actual use, and are used by more voters nationwide than any other system. Whether some of the proposed alternative verification methods will ever prove to be as practical, cost-effective and reliable is debatable. In the interim, however, we have elections to safeguard.

Whether non-paper records constitute meaningful audit records or not, the feasibility of carrying out post-election audits of such records is unknown. What is known (based on the results from numerous jurisdictions that have conducted manual audits of paper-based audit records) is that any voting system that produces audit records that record all of the voter's interactions with that system (i.e., each individual selection or de-selection, each individual keystroke for write-in candidate names, etc.) will require tremendously greater time and effort (when it comes time to actually use those records in a manual audit of the election) compared to the time required to conduct manual audits of audit records (such as voter-verified paper ballots) that simply record a summary of each voter's final choices. Many of the proposed schemes for using audio or video based records are subject to this concern.

The cost of non-paper verification methods is also a major question. There are no currently fielded systems that utilize video, audio, or pictorial verification methods, but the available data on the cost of direct-recording electronic voting systems – to which such verification systems would be added — are instructive. Direct-recording electronic machines are expensive to purchase and maintain. The costs of these systems have proven greater than those of paper ballot-optical scan systems, as shown by studies in Florida,<sup>6</sup> North Carolina,<sup>7</sup> and Maryland.<sup>8</sup> The methods of non-paper verification allowed by the bill would likely increase election costs without increasing public confidence in election outcomes.

If new methods of election verification improve substantially upon existing methods, then increasing the costs and burdens of conducting elections might be justifiable. The paperless technologies envisioned by S.3212 do not meet this standard. We believe that expanding the number of different types of "independently verified records" will significantly increase:

- a) capital and operational costs of conducting elections,
- b) demands on poll workers, elections staff, and elections officials,
- c) complexity and difficulty of chain of custody procedures, and
- d) complexity and difficulty of conducting meaningful and transparent election audits

This last point raises an inherent contradiction in the bill. S. 3212 purports to promote audits of elections for Federal office, but with some different types of "independently verified records," the bill makes such audits more difficult—or even impossible—to conduct in any meaningful way.

**3. Language in S. 3212 would exempt from any verification requirement those paperless voting systems purchased before January 1, 2009 to meet HAVA's accessibility requirements Passage of S.3212 would leave millions of voters (particularly those with disabilities) dependent on insecure paperless electronic machines for the foreseeable future.** The scope of this provision is open to interpretation. At a minimum, it would exempt many of the paperless electronic touch screen or direct recording electronic (DRE) machines now in use. But depending on how this provision would be interpreted and applied in practice, it could exempt most of these machines. At present, nine states do not yet appear to have plans to phase out their paperless electronic voting systems. These systems have been demonstrated to be unacceptably insecure and manifestly unverifiable by a large body of governmental, academic, and private sector studies: the 2003 SAIC report,<sup>9</sup> the Government Accountability Office report of 2005,<sup>10</sup> the 2006 report of the Task Force on Voting System Security at the Brennan Center for Justice,<sup>11</sup> and most recently, the reviews of voting systems commissioned by a number of states, including California,<sup>12</sup> Ohio,<sup>13</sup> and Kentucky.<sup>14</sup>

Legislation that allows these paperless electronic voting systems to be used indefinitely cannot claim to promote electoral integrity or increase voter confidence.

**4. S. 3212 is opaque and disturbingly open to interpretation on a critical question: would the bill require that it be the voter who verifies the contents of the independent record?** The bill states that the verification records are to be "independent of the device on which the vote is cast." A recommendation for "independent voter-verified records" is part of the draft Voluntary Voting System Guidelines now under consideration by the Election Assistance Commission (EAC).

*However, the term "independent voter-verified [or verifiable] records" itself appears nowhere in the bill.* S. 3212 would create a requirement for an "independent method of verification" in a proposed new paragraph that would amend paragraph (1)(A)(i) of the HAVA section 301(a).

Paragraph (1)(A)(i) would require only that the voter be able to verify the contents of the "ballot" before the "ballot" is cast. Under this language, a "ballot" may simply be the vote choices as displayed momentarily on the touch screen surface; nowhere does S. 3212 define the independently produced record as a ballot or a component of a ballot. This contrasts with other cases of election verification

legislation in which the authors have chosen to define a voter-verifiable paper or alternate record as the official ballot of record. S. 3212 makes no such choice with regard to the independent records mandated by the bill.

In addition, the new paragraph (7) that sets forth “Method[s] of Independent Verification” does not say that the voter is allowed to do the verification. Instead, it says, “The voting system shall provide for verification of the votes selected by the voter.” In other words, someone or something else could “provide for verification of the votes selected by the voter.”

The draft Voluntary Voting System Guidelines (VVSG) include standards for verifiable voting systems that are far superior to the language of S. 3212, and we strongly support adoption of the draft VVSG. To be clear, under S. 3212 the EAC could still adopt VVSG that are more robust than the requirements of the bill. But the EAC's authority to adopt stronger voluntary guidelines does little to offset S. 3212's deficiencies, because the VVSG are not binding on the states, and because their adoption depends upon an administrative decision by the EAC.

It is hard to understand why the bill's language was drafted in such an opaque manner; in the last five years, many proposed bills to amend HAVA have been very straightforward in requiring voter-verifiability of paper or other forms of ballot records. If the intent of S.3212 is indeed to require voter-verifiability of independent records, the bill inexplicably leaves such a requirement far too open to interpretation. *It remains debatable whether S.3212 would require that the “independent” records be verified or verifiable by the voter before the voter casts a ballot.*

**5. S. 3212 does not define the legal status of the independent record in the event of a discrepancy in vote tallies.** If the vote tallies of the independently-produced records disagree with the initial vote tallies of electronic voting systems, S. 3212 offers no guidance on how to adjudicate the discrepancy. This silence could create a situation in which one state decides that the independent records shall never be the final record in the event of a discrepancy, and another state designates the independent record as the ballot of record.

Failing to define the legal status of independent records allows states to ignore the independent record altogether in any recount or contest of an election for Federal office, leaving voters in those states with no better protection from electronic voting errors than they currently have.

**6. S. 3212 would not require states to use the independent records in post-election audits.**

The bill would require states to conduct an audit of the results of all Federal elections once the independent-verification requirements take effect in each state. It would also require the Election Assistance Commission to adopt model audit guidelines specific to each type of independent record allowed under the bill (but it is important to note that the bill fails to include optical scan paper ballots on that list). The EAC would adopt voluntary model audit guidelines after receiving recommendations from a newly created Audit Guidelines Development Task Force.

The absence of a statistician from the required composition of the Audit Guidelines Development Task Force is worth noting. S.3212 would require that the Task Force include “experts in such fields as election audits, physical security of ballots, recounts, computer technology, and election management,” but it does not require that the Task Force include a statistician. Statisticians offer significant

contributions to the study and design of post-election audits, and we believe that the input of statistical experts would promote model guidelines that increase both the rigor and the efficiency of audits.

But S. 3212 would not require that audits of Federal election results follow the adopted model guidelines. Neither would it establish any minimum requirements to ensure that those audits are meaningful, such as ensuring the randomness of the process used to select precincts for audit or the independence of those overseeing the audits. Nor does it specify what form of record the audit must use. The states are required only to submit to the EAC a description of the procedures they intend to use to audit election results, as well as the results of the audit.

The states could choose to conduct an “audit” of election results by examining the electronic records of the voting system and ignoring the independent records altogether. With no mandate that these audits be modeled on the most basic of sound post-election auditing principles, this audit provision is toothless.

**7. S.3212 would not require the EAC to adopt model audit guidelines for jurisdictions that use paper ballot optical scan technology (now the most common voting system in the United States) nor does it require optical scan paper ballots to be utilized in any audits conducted in those jurisdictions.**

VerifiedVoting.org has strongly supported the purchase and deployment of paper ballot optical scan systems for their cost-effectiveness, reliability, transparency and most importantly, for their auditability.

But optical scanners are also computerized voting systems that depend on software, so they are therefore inherently vulnerable to error or tampering. As is true for DRE voting systems, security studies of optical scan systems, including the Brennan Center report,<sup>15</sup> the Secretary of State of California's Top-to-Bottom review,<sup>16</sup> and studies by computer scientists at the University of Connecticut,<sup>17</sup> confirm our position that *post-election audits are essential to the integrity of elections using optical scan systems*. The Brennan Center Task Force on Voting System Security, which included some of the world's top computer scientists, stated that without an automatic routine audit, the security value of the paper ballots used in optical scan systems is “highly questionable.”<sup>18</sup>

Under S. 3212, jurisdictions that use optical scan systems would presumably have to conduct an audit, but the bill does not require the optical scan paper ballots to be the records that are audited. Rather, the bill allows states to use any audit procedures they choose; a state could simply “audit” the memory cards of the scanners, or re-tabulate optically scanned paper ballots using the same machines that were used in the election.

S. 3212 would also re-authorize HAVA's requirements payments to help states meet the requirements of HAVA Title III, which would include the new audit requirements defined by this bill. But optical scan paper ballots are not included in the list of "independently verified records" for which the EAC and the Audit Guidelines Development Task Force are charged with developing model audit guidelines. Nor does the bill's audit requirement specify that the optical scan paper ballots be the record that is audited in jurisdictions using that voting technology.

Together, this leaves us with the very uncomfortable possibility that the bill would pay states to conduct audits by, for example, comparing electronic records to electronic records, but would *not* pay states to

conduct audits by comparing the electronic tally from an optical scanner to a hand count of the corresponding set of paper optical scan ballots. This is precisely the opposite of the audit funding outcome we would support.

Even if that were not the result of the language as drafted, the bill's failure to provide funding now for audits conducted using optical scan paper ballots ignores the fact that unlike the as-yet-unimplemented "independently verified records" that are envisioned by this bill (but which will not be available for years), optical scan paper ballots can already perform that function in present-day audits.

The bill's failure to require minimum *mandatory* standards for audits of any voting system is also a profound flaw. But even accepting the voluntary nature of the bill's proposed audit guidelines, S.3212's failure to require the development of even such voluntary model audit guidelines for the nation's most widely used voting technology is very unwise.

**8. S. 3212 is unclear regarding how its requirements would apply to accessible ballot marking devices.** A ballot marking device is a non-tabulating device that marks a paper ballot. The most widely used ballot marker, the AutoMARK, provides a touch screen interface as well as a dual-input capability; it marks the same optically scanned paper ballot used by other voters in the jurisdiction.

Such devices are one of the most widely used methods of serving voters with disabilities, and of fulfilling the Help America Vote Act's requirement all polling places are equipped to allow voters with disabilities to vote privately and independently. Ballot marking devices are used in 31 states.

S. 3212 requires that all voting systems covered by its independent verification requirement must provide independent verification "in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters." Exempted from this requirement are voting systems that utilize paper ballots "marked personally by the voter." It is far from clear where this exemption leaves the legal status of ballot-marking devices.

For example, if a jurisdiction uses precinct-based optical scanners with a ballot-marking device in each polling place, is that "voting system" (in the aggregate) considered to be a "voting system which uses paper ballots that are personally marked by the voter" because at least *most* of the voters in that jurisdiction mark their ballots personally? Or are ballot markers not included under that umbrella, since ballots marked by ballot marking devices might not be considered to be "personally marked by the voter?" This lack of clarity invites legal challenges to one of the most widely-used accessible voting systems.

Uncertainty may chill the plans of several states to purchase ballot-marking devices. This would be unfortunate, because ballot marking systems (including AFB) are more accessible than many other voting systems now deployed for the purpose of complying with HAVA's accessibility requirements. In the last year an accessibility review conducted for the Secretary of State of California concluded that direct-recording electronic voting machines made by Premier/Diebold, Sequoia Voting Systems, and Hart Intercivic were substantially non-compliant with HAVA<sup>9</sup>, while the AutoMARK ballot marker is substantially compliant.<sup>20</sup>

**9. S.3212 may restrict the publication of valuable information about the security and reliability of voting systems.** We believe that voting system software should be publicly disclosed, and, given the technologically straightforward task of computer vote tabulation, such disclosure would not compromise trade secrets. However, in the past we have supported legislation that did not require full public software disclosure, but rather took an incremental step in the right direction by requiring that independent experts be provided access to review and analyze voting system software. S.3212 commendably requires the disclosure of election-dedicated software to the Election Assistance Commission and to the states. The bill allows the review and analysis of election-dedicated software by some third parties, such as parties to litigation and technical experts. This improves on the status quo.

However, this bill's language regarding the publication of voting system analyses is not supportable. The bill permits "disclosing reports and analysis that describe operational issues (including vulnerabilities to tampering, errors, risks associated with use, failures as a result of use, and other operational issues) ... but only if the information published does not compromise the integrity of the software or result in the disclosure of trade secrets or other confidential commercial information, or violate intellectual property rights in such software."

The term "confidential commercial information" is ill-defined. We are concerned that this language could be invoked and applied in such a way that it would choke off the publication of important analyses of voting systems, such as the landmark California Top-to-Bottom review of voting systems, or the Ohio EVEREST voting system review. Versions of both these reviews have been made public after trade-secret information was redacted, and the public documents from these studies have provided invaluable information about one of the most fundamental elements of our democracy: the processes used to register the will of the voters. When expert reviews of the security and reliability of election technology are conducted, the public has a right to as much knowledge as can be disclosed about such reviews, unhampered by unnecessary "commercial information" protections.

**10. S. 3212 would place a representative of the voting system manufacturing industry on the committee that drafts federal voluntary voting system guidelines.** S. 3212 would establish a position on the EAC's Technical Guidelines Development Committee for a representative of the voting system manufacturing industry. This provision is ill-advised. The Guidelines should be developed independently of the influence of those who market the systems. The EAC can (and already does) receive the input of vendors before making decisions on adoption of the Guidelines.

Representatives of industries regulated by the federal government sometimes serve on legally authorized committees that advise federal agencies. For example, the technical advisory committees of the federal Food and Drug Administration may include one nonvoting member selected by industry groups or associations, and one nonvoting member selected by consumer groups or organizations.<sup>21</sup> The contrast between the FDA process and the proposed addition to the TGDC is strong. The voting system industry's representative on the TGDC would have the same status as other members of the Committee, in contrast to the nonvoting status of industry representatives serving on FDA technical advisory committees.

S. 3212 also adds a representative of "the voting system accessibility and usability sector." While we applaud the inclusion of representation for these sectors, we believe it is not appropriate to include usability and accessibility in the same category, and one member should not be tasked as a representative of both. Voting system accessibility is defined by the current federal Voluntary Voting

System Guidelines as the ability of voting systems to serve voters with disabilities.<sup>22</sup> Voting system usability has been defined as how effectively and correctly a voting system serves the entire electorate according to such metrics as a low error rate in marking the ballot, an amount of time required to vote that is not excessive, and satisfaction.<sup>23</sup>

## **Conclusion**

It is our view that all elections should be accessible, publicly verifiable, independently auditable, and as simple and cost-effective as possible, both to conduct and to audit. There is room for innovation, but innovation occurs even without such legislation, when demand exists. But we must take the necessary steps to safeguard all our elections—today, not years down the road. Yet this bill does not do that. Instead, it *allows unverifiable systems to persist indefinitely*.

However well-intentioned, S. 3212, if enacted as written, would damage the transparency and reliability of Federal elections in the U.S. for decades to come. VerifiedVoting.org respectfully urges citizens and members of the United States Senate to oppose its passage.

- <sup>1</sup> Public Comment on the Voluntary Voting System Guidelines, Version II. ACCURATE: A Center for Correct, Usable, Reliable, Auditable, and Transparent Elections. May 5, 2008. [http://accurate-voting.org/wp-content/uploads/2008/05/accurate\\_vvsg2\\_comment\\_final.pdf](http://accurate-voting.org/wp-content/uploads/2008/05/accurate_vvsg2_comment_final.pdf)
- <sup>2</sup> Testimony of Edward W. Felten. U.S. House of Representatives, Committee on House Administration, Subcommittee on Elections, Hearing on Election Reform: HR 811, March 23, 2007. [http://cha.house.gov/UserFiles/109\\_testimony.pdf](http://cha.house.gov/UserFiles/109_testimony.pdf)
- <sup>3</sup> ACM Policy Recommendation on Electronic Voting, September 2004. <http://usacm.acm.org/usacm/Issues/EVoting.htm>
- <sup>4</sup> It is not immediately clear what is meant by a “pictorial record.” Since the bill lists a “pictorial record” as a separate type of record, it is presumed to be distinct from other forms of independent record, including paper. If a “pictorial record” is not a paper record, then it must be displayed to the voter by some other means, possibly via an electronic display. This may leave no independent tangible copy of the voter’s intent, rendering it useless for auditing.
- <sup>5</sup> <http://www.sos.state.or.us/elections/HAVA/accessibility.shtml>
- <sup>6</sup> Comparison of Operating Costs: Punch Card and Electronic Voting Machines in Sarasota County, Florida and Optical Scanners in Manatee County, Florida. <http://verifiedvoting.org/downloads/myerson.pdf>
- <sup>7</sup> Operating Cost Comparison for Different Types of Voting Systems. <http://www.ncvoter.net/affordable.html>
- <sup>8</sup> The Costs of Maryland's Electronic Voting System. <http://www.saveourvotes.org/reports/index.htm#27>
- <sup>9</sup> “State of Maryland Voting Machine Risk Assessment.” Security Application International Corporation, 2003, [http://www.md-eic.org/Documents/SAIC\\_risk\\_assessment.pdf](http://www.md-eic.org/Documents/SAIC_risk_assessment.pdf)
- <sup>10</sup> “Elections: Federal Efforts to Improve Security and Reliability of Electronic Voting Systems are Under Way, but Key Activities Need to be Completed.” Report of U.S. Government Accountability Office, 2005, <http://www.gao.gov/new.items/d05956.pdf>
- <sup>11</sup> “The Machinery of Democracy: Protecting Elections in an Electronic World.” Report of the Task Force on Voting System Security of the Brennan Center for Justice, 2006. [http://www.brennancenter.org/dynamic/subpages/download\\_file\\_39288.pdf](http://www.brennancenter.org/dynamic/subpages/download_file_39288.pdf)
- <sup>12</sup> [http://www.eac.gov/extlnk/lnkframehead.htm?http%3A/www.sos.ca.gov/elections/elections\\_vsr.htm](http://www.eac.gov/extlnk/lnkframehead.htm?http%3A/www.sos.ca.gov/elections/elections_vsr.htm)
- <sup>13</sup> EVEREST Voting System Review. Report of the Secretary of State of Ohio, 2007, <http://www.sos.state.oh.us/sos/info/everest.aspx>
- <sup>14</sup> “Ensuring Your Vote Counts: Kentucky's Electronic Voting Systems.” Report of the Attorney General of Kentucky, 2007, [http://www.eac.gov/voting%20systems/docs/report-kentucky-voting-systems-certification-process2.pdf/attachment\\_download/file](http://www.eac.gov/voting%20systems/docs/report-kentucky-voting-systems-certification-process2.pdf/attachment_download/file)
- <sup>15</sup> “The Machinery of Democracy,” p. 83.
- <sup>16</sup> Press Release of the Secretary of State of California, August 3, 2007. [http://www.sos.ca.gov/elections/voting\\_systems/ttbr/db07\\_042\\_ttbr\\_system\\_decisions\\_release.pdf](http://www.sos.ca.gov/elections/voting_systems/ttbr/db07_042_ttbr_system_decisions_release.pdf)
- <sup>17</sup> “Tampering with Special Purpose Trusted Computing Devices: A Case Study with Optical Scan E-voting.” Report of the Voting Technology Research Center. University of Connecticut, 2007, [http://voter.engr.uconn.edu/voter/Reports\\_files/seeA-tamperEVoting.pdf](http://voter.engr.uconn.edu/voter/Reports_files/seeA-tamperEVoting.pdf)
- <sup>18</sup> “The Machinery of Democracy, p. 83.
- <sup>19</sup> “Accessibility Review Report for the California Top-to-Bottom Voting Systems Review.” By Noel Runyan and Jim Tobias. [http://www.sos.ca.gov/elections/voting\\_systems/ttbr/accessibility\\_review\\_report\\_california\\_ttb\\_absolute\\_final\\_version16.htm#LinkTarget\\_4226](http://www.sos.ca.gov/elections/voting_systems/ttbr/accessibility_review_report_california_ttb_absolute_final_version16.htm#LinkTarget_4226)
- <sup>20</sup> “Election Systems & Software, Inc. Unity 3.0.1.1 Access Review.” By Noel Runyan and Jim Tobias. [http://www.sos.ca.gov/elections/voting\\_systems/unity\\_3011\\_accessibility.pdf](http://www.sos.ca.gov/elections/voting_systems/unity_3011_accessibility.pdf)
- <sup>21</sup> Code of Federal Regulations, Title 21, Chapter 1, Part 14, Section 14.84. [http://edocket.access.gpo.gov/cfr\\_2008/aprqr/21cfr14.84.htm](http://edocket.access.gpo.gov/cfr_2008/aprqr/21cfr14.84.htm)
- <sup>22</sup> United States Election Assistance Commission, 2005 Voluntary Voting System Guidelines, Volume 1, Section 3.2. [http://www.eac.gov/voting%20systems/docs/vvsgvolume1.pdf/attachment\\_download/file](http://www.eac.gov/voting%20systems/docs/vvsgvolume1.pdf/attachment_download/file)
- <sup>23</sup> United States Election Assistance Commission, 2005 Voluntary Voting System Guidelines, Volume 1, Section 3.1 [http://www.eac.gov/voting%20systems/docs/vvsgvolume1.pdf/attachment\\_download/file](http://www.eac.gov/voting%20systems/docs/vvsgvolume1.pdf/attachment_download/file)