

**Affidavit of Dr. Douglas W. Jones**  
**Regarding the Voting Systems Standards Proposed**  
**by the New York State Board of Elections in December 2005**

I, Douglas W. Jones, make this affidavit under penalty of perjury and state as follows:

1. I am an Associate Professor at the University of Iowa in the Department of Computer Science, where I have taught since 1980. My areas of specialization include voting technology. This affidavit is based upon my personal knowledge and professional opinion.

**Expertise Regarding Voting Technology**

2. I received both my Masters and Doctoral degrees in computer science from the University of Illinois in 1976 and 1980, respectively, and graduated with a Bachelor's of Science in physics from Carnegie-Mellon University in 1973.
3. I served on the Iowa Board of Examiners for Voting Machines and Electronic Voting Systems from 1994 to 2004, and chaired the board for 3 terms. This board examines all voting systems offered for sale in the state of Iowa to determine if they meet the requirements of Iowa law.
4. At the invitation of the U.S. Commission on Civil Rights, I testified at their January 11, 2001 hearings in Tallahassee, Florida; my prepared statement was entitled "Evaluation of Voting Technology." At the invitation of the U.S. House Committee on Science, I testified on at their May 22, 2001 hearings; my prepared statement was entitled "Problems with Voting Systems and the Applicable Standards." I was invited to and did testify before the Federal Election Commission on voting system standards

- for their April 17, 2002 hearings as well, after submitting extensive comments on their December 13, 2001 Draft Voting System Standards.
5. In the summer of 2004, I consulted with Miami-Dade County in Florida to assess problems with their touch-screen electronic voting system and to assess their pre-election testing procedures for their touch screen and optical scan voting systems.
  6. I am one of the ten principle investigators in A Center for Correct, Usable, Reliable, Auditable, and Transparent Elections (ACCURATE), a multi-institutional center awarded a 5-year research grant by the National Science Foundation starting in October 2005.
  7. In November 2005, I was invited to Kazakhstan by the Office for Democratic Institutions and Human Rights of the Organization for Security and Cooperation in Europe to help assess the Kazakh electronic voting system.
  8. I wrote Chapter 1 of the book entitled "Secure Electronic Voting," edited by Dimitris Gritzalis and published by Kluwer Academic Publishers in 2002.
  9. My paper, Auditing Elections, was published in the journal "Communications of the Association for Computing Machinery" in October 2004.
  10. In addition to the foregoing, I have also written and published extensively on issues related to voting technology, including the following articles: "Misassessment of Security in Computer-Based Election Systems," *Cryptobytes*, 7, 2 (Fall 2004), pp. 9-13; "Counting Mark-Sense Ballots," posted on the web in 2002 at [www.cs.uiowa.edu/~jones/voting/optical.html](http://www.cs.uiowa.edu/~jones/voting/optical.html); "Chad, from Waste Product to Headline," posted on the web and revised in 2001 at [www.cs.uiowa.edu/~jones/cards/chad.html](http://www.cs.uiowa.edu/~jones/cards/chad.html).

11. Furthermore, I have taught a course at the University of Iowa titled “Computers in Voting and Elections,” and I have lectured on problems in voting technology used in American elections, and the use of computers in elections.

12. I have testified or presented papers on voting technology at numerous hearings.

These include:

- “Regarding the Optical Mark-Sense Vote Tabulators in Maricopa County,” prepared for the Arizona Government Accountability and Reform Committee, Jan. 12, 2006;
- “Reliability of U.S. Voting Systems: An Assessment in Light of Recent Changes,” testimony before the Congressional Black Caucus, Oct. 7, 2004;
- “Voting System Transparency and Security: The need for standard models,” before the U.S. Election Assistance Commission Hearing on Transparency and Security, National Institutes of Standards and Technology, Sept. 20, 2004;
- “On Optical Scanning,” DIMACS Workshop on Electronic Voting – Theory and Practice, Rutgers University, May 27, 2004;
- “How Do You Know Your Vote was Counted,” lecture sponsored by the University of Illinois - Springfield, the ACLU and the NAACP, April 14, 2004;
- Joint presentation with the Iowa Secretary of State on the dilemmas posed by the Help America Vote Act, Iowa State Associations of Counties, March 17, 2004;
- “Strengths and Weaknesses of Voting Systems,” keynote address to the Second Inter-American Meeting on Electoral Technology, Organization of American States, in Panama City, Panama, March 1, 2004;

- “How Safe is our Voting System,” Cornell College, Jan. 8, 2004;
- “Why Trustworthy Voting Systems Require Institutionalized Distrust,” First Symposium on Building Trust and Confidence in Voting Systems, National Institutes of Standards and Technology, Dec. 10, 2003;
- “The Diebold AccuVote TS Should be Decertified,” Panel Discussion on Electronic Voting, 12<sup>th</sup> USENIX Security Symposium, Aug. 6, 2003;
- “E-Voting: Are our Defenses Adequate to Defend Citizens’ Rights?” International Telecommunication Union Workshop on Challenges, Perspectives, and Standardization Issues in E-Government,” Geneva, Switzerland, June 6, 2003;
- “Human Factors in Voting Technology: An Ethical Response,” Council on Governmental Ethics Laws, Ottawa, Canada, Sept. 30, 2002;
- “End-to-End Standards for Accuracy in Paper-Based Systems,” Workshop on Election Standards and Technology, Jan. 31, 2002;
- “Election Reform in Iowa,” National Conference on Governance, National Civic League, Nov. 17, 2001;
- “Counting Votes with Computers,” keynote address to the League of Woman Voters of Johnson County, Iowa, May 16, 2001.
- “E-Voting: Prospects and Problems,” 31<sup>st</sup> annual Tau Beta Pi, Paul D. Scholz Symposium, April 13, 2000;

**Election Integrity and Reliability Concerns Raised by the Proposed Standards**

13. I have reviewed the draft voting systems standards proposed by the New York State Board of Elections (“the Board”). In light of this review, and given my expertise and

research on voting technology issues and the security, integrity and reliability of ballot counting systems, it is my professional opinion that the proposed standards, as written, fail to sufficiently regulate the electoral process to provide the necessary degree of security, integrity and reliability.

14. I note in detail below the specific issues and omissions in the proposed standards that in my professional opinion should be addressed by the Board, and how they should be addressed, to promulgate standards which would aid in creating a voting system that is secure, reliable and accurate, as well as accessible to all voters.

**Section 6209.1 Definitions – revisions**

15. Many of the definitions provided in Section 6209.1 are problematic, in ways that directly impact voting system security, integrity and reliability.
16. In paragraph 1, the definition of “acceptance test” is too narrow. The language in the proposed standards limits testing to software, when acceptance testing ought to be required for all hardware as well. There have been several instances where defects were found in the hardware of voting machines. For example, in Miami-Dade County, Florida, Donald Llopez reported to me that acceptance testing found significant failures in a few percent of memory devices for the voting machines provided by one voting system vendor. In Cook County, Illinois, in contrast, there was apparently no effective system of acceptance testing. As a result, a large number of defective Votomatic punching templates were put in place at precinct polling places, causing significant problems for voters in November 2000. The nature of the defects was eventually documented by Michael Hites and Bill Ornt of the Illinois Institute of Technology in their August 24, 2001 report, “Testing of Vote Recorders.”

17. The definition of “ballot layout” in paragraph 3 should explicitly define “ballot layout” as being the applicable term, whether the ballot is on screen or on paper.
18. The definition of “DRE” (direct recording electronic voting), in paragraph 4, leaves out the key attribute of DRE machines, that a vote is recorded directly in electronic form without an intermediate record of the vote being created. The definition given is also too narrow and leads to a ridiculous result. By defining a DRE voting system in terms of a “ballot display provided with mechanical or electro-optical components,” machines which use ultrasonic touch screens or capacitive touch screens are excluded.
19. The definition of “Election Management Software (EMS)” in paragraph 6 is an extraordinarily narrow definition. In general, election management systems are also used to extract electronic records from the memory of DRE and precinct-count mark-sense systems, not only as part of the canvassing process but also as part of the audit process. They can also be used in canvassing to consolidate the results of voting in many precincts to produce district-wide totals.
20. The definition in paragraph 7 of “encrypted copy” is inaccurate and presents serious security issues. In general, an encrypted copy of any data is a copy of that data that has been transformed using some encryption key so that the data can only be recovered in useful form by someone possessing the correct decryption key. Although computer programs are a kind of data that may be encrypted, encryption may be used to protect other kinds of data as well. Furthermore the limitation to the manufacturer given in this definition is only meaningful if the manufacturer is the only one who possesses the correct decryption key. Without proper key management, no one would know who possesses what keys, which means there would be no way to account for who can decrypt what data.

21. In paragraph 10, the second clause of the definition of “modification” is an invitation to disaster. The second clause allows for the conclusion that a change does *not* require re-examination when, for example, the change only indirectly affects the system operation. This has caused problems in the past, for example, when Fidler and Chambers changed the version of Windows 95 in their EV 2000 DRE voting system in January 1998, this change was deemed not to require re-examination by the Federal Independent Test Authorities (ITAs) under the Federal Election Commission (FEC) standards. Yet I found the change resulted in a severe violation of voter privacy by revealing each voter’s chosen candidates to the next voter using the same machine.
22. The definition of “operational manual” in paragraph 11 is too narrow. The operational manual should be defined simply as a document containing all procedures involved in every phase of the operation of voting equipment by board of elections personnel.
23. The definition of “pre-qualification test” in paragraph 12 is dangerously narrow, as it only covers testing of the tabulation function. While testing the tabulation function is necessary and important, there are many other attributes of the system that ought to be tested, such as human factors considerations.
24. The definition of “printout” laid out in paragraph 13 is also problematic. This definition limits “printout” to printouts of either zero-totals reports or precinct canvass reports. It does not take into account other items the machine may print out. I would recommend defining each of these two types of reports separately. The terms to be defined could be (i) “zero-totals reports” or alternatively “polling place opening report,” and (ii) “precinct canvass report” or alternatively “poll closing report.”

Defining these terms separately would allow for the term “printout” to retain its generic meaning.

25. The definition of “software” in paragraph 15 is unclear and too narrow. First, the term “code” is ambiguous. Second, limiting the definition of software to the vote counting system is troublesome. A better definition would be “all instructions controlling the operation of the voting system.”
26. The definition of “firmware” in paragraph 16 is also problematic, for two reasons. First, it implies that it is the only software that is “not capable of being altered during system operation.” In reality, no voting system software should ever be altered during system operation. Second, firmware should be defined as a type of software. A better definition of firmware might be “a kind of software stored in read-only memory that is not subject to change or modification in the course of normal system use.”
27. The definition of “resident vote tabulation programming” in paragraph 17 is garbled and nonsensical. This definition should be revised since, by definition, central processing units cannot be places where this firmware is stored.
28. The definition in paragraph 17a of “resident memory” is also too narrow. It fails to account for voting systems where the internal memory is used in other ways, and where votes are stored in external memory, for example in some cases, votes are stored on compact flash cards.
29. The definition of “source code” in paragraph 18 is unclear. “Source code” ought to be explicitly defined as something like “the human readable representation of the instructions making up the software and firmware.”
30. The definition of “tactile discernible controls” in paragraph 26 is wrong. Tactile discernible controls are those that can be located and operated by the sense of touch.



While it may be the case that these controls are also accessible as defined by the proposed standards, the proposed standards fail to provide an accurate definition. An example of a tactile discernible control is the tactile discernible bump on the “J” key that helps one type when one is not looking at the keyboard.

31. Similarly, the definition of “audio voting feature” in paragraph 27 is inaccurate.

Audio voting features may have little or nothing to do with meeting the needs of individuals with motor impairments. Although individuals with motor impairments may need to use push buttons that are used with the audio interface, they generally prefer to use these buttons *in conjunction* with the visible voting system screen.

### **Definitions Missing in Section 6209.1**

32. A definition is needed for “central count optical scan.” A central count optical scanner is likely to be used to tabulate absentee ballots no matter what is used in the precinct polling places. It is also worth noting that the phrase “optical scan” is really short form for “mark-sense optical scan ballot tabulator,” and that the phrases “mark sense” and “optical scan” both refer, generally, to the same type of ballot and tabulator.

33. A definition is needed for the terms “election configuration” and “election configuration file.” In general, the voting system software interprets an election configuration file in order to present ballot displays and interpret votes cast. The terms “election definition file” and “ballot configuration file” are also commonly used. Typically, the election management system is used to create election configuration files. These files are not properly considered software, even though it is common to use the term “election programming” to refer to them.

34. A definition is needed for the term “voting target.” The term “voting target” should be defined in the context of optical-scan voting systems as the area within the voting position where the voter should mark the ballot in order to record a vote. In the context of DRE voting systems, the voting target is the area on the face of the machine within the voting position where the voter must touch or press in order to record a vote.
35. For optical-scan voting systems, the term “prescribed mark” must be defined. It should be defined as the form of a mark, a voter is instructed to place in the voting target in order to record a vote.
36. For optical-scan voting systems, the term “acceptable mark” must also be defined. It should be defined as the form of a mark, in or around the voting target, that should be counted as a vote. In general, voters cannot be expected to accurately create the prescribed mark. The federal Help America Vote Act (HAVA) requires states to address this issue. HAVA § 241(b)(13)(A)(iii).
37. A definition for “voting booth” is needed. The definition should include integral voting booths and auxiliary booths, since some voting systems incorporate voting booths while others require use of a separate voting booth.

#### **Section 6209.2 – Polling Place Voting System Requirements**

38. The requirement to provide a full-face ballot display on a single surface, found in subparagraph A(1) of this section, does not appear to further any particular state interest. In fact, there is little empirical evidence to support the desirability of this requirement. On the other hand, large full-face voting machines pose particular problems for individuals with motor disabilities that limit their reach or dexterity.

Furthermore, certain ballot access rules can defeat this requirement on any voting system. For example, consider California's gubernatorial recall election with 135 candidates for a single office. The full-face requirement appears to be motivated by considerations of human factors, and it is these underlying considerations that should be documented and codified as requirements; in general, standards should document what the voting system should achieve, not how the voting system must achieve it.

39. While the requirement of machine self-tests found in subparagraph A(5) of this section are valuable, they are not a sufficient substitute for the casting of real test ballots. These self-tests do not test the actual input devices, such as switches, touch screens, and ballot scanners; these are the components most likely to fail. In addition to the requirement of self-tests, there must therefore be a provision requiring the casting of real test ballots.
40. The requirement in subparagraph B(2) that voting equipment have an audio voting feature is insufficient to ensure full accessibility for disabled voters to the equipment. As stated above, audio voting features may have little or nothing to do with meeting the needs of individuals with motor impairments. Although individuals with motor impairments may need to use push buttons that are also used with the audio interface, many such voters will prefer to use these buttons in conjunction with the visible voting system screen. Also, this requirement ignores such technologies as the Voting-on-Paper Assistive Device (Vote-PAD), an alternative and low-cost approach to meet the needs of voters with a range of disabilities.
41. The standard laid out in subparagraph C(2) for the noise level of write-in components of voting equipment does not fully protect the privacy of a voter who desires to cast a write-in vote. In my experience, the write-in features of most DRE systems are so

cumbersome that others can infer that a voter is using these features simply from the extra time that it takes to cast a write-in vote.

42. Paragraph D of Section 6209.2 is too narrowly focused on curtain design. The concern that should be addressed is protecting voter privacy and there is no reason to require curtains if voter privacy can be ensured in other ways. I would suggest that paragraph D be named “Standards for Voter Privacy” instead of “Standards for curtain design.” I propose the following text for this section:

“(1) Voting systems that do not include integral voting booths shall be certified only in the context of a particular voting booth or voting booths.

(2) The voting system, used with its approved booth, shall be so constructed that no one within the polling site will be able to see how a voter is casting a vote.

(3) If curtains are required to meet requirement (2), they shall be designed to allow any voter, either electronically or mechanically, to open or close the curtain with ease . . .”

43. Finally, the environmental standards laid out in paragraph E are vague and severely underspecified. For example, the standard fails to cover such issues as vibration and mechanical shock during transport. The environmental standards should be covered in detail or should adopt by reference a reasonable standard, such as the 1990 or 2002 Federal Election Commission standards.

### **Section 6209.3 – Paper-based Voting Systems**

44. With respect to paragraphs A, H, and I of Section 6209.3, the provisions put forth in these paragraphs should not apply only to paper-based voting systems. Rather, these requirements should be general, applying to all voting systems.

45. Paragraph A fails in the context of central-count optical scan tabulation of absentee ballots. In this context, how will New York address the requirements set out by

HAVA for preventing a voter from voting on candidates or proposals for which he is not entitled to vote, from over-voting, from voting for the same person for the same office or position more than once, and from voting for candidates of another party in a primary election. Although HAVA does not give any advice on how to meet these requirements, experience in Dallas, Texas, Arlington, Virginia and many other jurisdictions suggest that ballots containing votes that violate either subparagraph (1) or (2) of paragraph A should be sorted out during tabulation for hand processing by the same board that deals with ballots that were damaged by the post office and require duplication or reconstruction. Fred Berghoefer, Secretary of the Arlington, Virginia electoral board, reported that without such vote recovery procedures approximately 5 to 10% of absentee votes may be improperly discounted as over or undervotes if overvoted and blank ballots are not sorted out for human evaluation. This was documented in his oral testimony before the Technical Guidelines Development Committee on September 20, 2004 in Gaithersburg, Maryland, transcribed on the web at <http://vote.nist.gov/sept04hearings.htm>.

46. In paragraph E of this section, the use of the term “voting position” in each of the subsections is inconsistent with the definition given in Section 6209.1, paragraph 23. It appears that the requirements in paragraph E use the term “voting position” to refer to what is properly called the voting target. For the sake of clarity, the term “voting target” must be included in Section 6209.1 and the term “voting position” in the subparagraphs of paragraph E should be replaced with the term “voting target.”
47. There are several problems with paragraph G of this section. First, it is inaccurate to use the term “software” in paragraph G. The term that should be used is “election configuration file.” There has been a creeping use of the term “software” to describe

all voting system files. This is problematic because it prevents the public disclosure of certain files, such as the election configuration files. Note that most states have passed laws to protect the intellectual property rights of voting system vendors by exempting voting system software from public disclosure. In my opinion, files created by county boards of elections - such as the election configuration files - do not contain protected proprietary information of the vendors and should be immediately disclosed to the public when a problem arises with regard to the validity of an election. Second, even with the correct term inserted, the intent and meaning of this requirement is unclear. It is unclear whether this is something that would be tested as part of pre-election testing or whether this is a requirement that ballot style be encoded on the paper ballot, so that the ballot tabulating machine can determine what style is in use.

48. The two clauses in subparagraph K(4) should be split into two subparagraphs.
49. The standards have not set forth any requirement covering optical-scan ballot marking instructions. These instructions must not be left to the local election official's discretion, but must be set uniformly for all jurisdictions using a particular style of ballot. To do otherwise creates the risk that voters in different jurisdictions will have a different likelihood of having their votes counted because of differing quality of instruction.
50. There is no requirement that precinct-count optical-scan tabulating machines include a secure ballot box. Most vendors offer such ballot boxes, but several vendors have, in the past, offered precinct-count scanners that dropped the scanned ballots into cardboard or cloth containers.

51. There is no requirement that the ballot box connected to a precinct-count optical-scan tabulating machine include an emergency ballot compartment for use in the event of failure of the tabulating mechanism. Most vendors offer secure ballot boxes that incorporate such an emergency compartments, and many states properly provide for the use of these emergency compartments in the event of system failure.

**Section 6209.6 – Examination Criteria**

52. Subparagraph 2(1)(n), which provides for security requirements and provisions of the software, is vastly inadequate. Vendors should be required to identify each potential point of attack on the voting system, the technical defenses that are in place to guard against attack at each such point, and the procedural safeguards that are assumed to be in place to prevent each such attack. Where cryptographic methods are used, they should be clearly documented, including a discussion of how the key management problem is solved.

53. Subparagraph 2(5)(d), which encourages a minimization of factory repair tasks and lays out what percentage of all maintenance tasks should consist of factory repair tasks is overly restrictive and will be ineffective. First, these quantitative requirements cannot be accurately predicted but can only be determined after the fact, and usually years down the road. Second, for security reasons, certain activities - such as firmware upgrades - should specifically be required to be done at the factory, or at the least, should be required to be difficult or impossible to be done by the using agency. The reason why firmware is under a different set of protections than software, is that firmware is supposed to be hard to change. This subparagraph, rather

than recognizing that, would encourage ease of making these sorts of repairs by the using agency.

54. No requirements are set for physical security of precinct-based equipment. Both DRE and precinct-count optical-scan tabulators require physical security. Existing machines frequently make provisions for the use of security seals and locks. Unfortunately, the quality of locks varies immensely. The old AVM lever voting machine had very good locks; in Iowa, after losing the key to the AVM machine in the state museum, we hired a locksmith to try to pick the lock; he failed to do so within an hour. In contrast, RABA Technologies reported on January 20, 2004, that they had found that the locks on Diebold's AccuVote TS DRE voting machines were all keyed alike and could be picked in a few minutes. In my examination of the ES&S iVotronic DRE voting machine, I found that some access points for the machine had no provision for security seals and that the seals being used were flimsy and easily broken in a context where voters had easy access to the seals.

#### **Section 6209.10 Acceptance Testing**

55. This section of the proposed standards is lacking a provision for statistical quality control methods. Statistical quality control methods should be used where large numbers of identical units are delivered. In addition to minimal acceptance testing on all units, some units should be selected at random for intensive testing.

#### **Section 6209.11 Routine Maintenance Test of DRE Voting Equipment**

56. The testing requirements of paragraphs A through C are extraordinary. I have never seen such requirements before. The requirement in paragraph C that 200 ballots be cast on each machine during each testing period is extraordinarily high. Casting this



number of ballots on a DRE voting system would require approximately half a day's work. While testing before each election with the ballot used in that election makes sense, testing when no election is pending is of very limited value, with the main result being exhaustion of considerable expenses and resources.

57. The test requirements laid out in paragraphs E and F are not time-driven tests, but are normal pre-election tests. As such, they could be folded into a normal pre-election test requirement.

### **Section 6209.12 Operational and Testing Procedures for Paper-Based Voting Systems**

58. The standards in paragraph B fail to provide for constructing a test desk to check sensor calibration. The counties must test sensor calibration. In my experience, vendors have a bad record in this arena. For example, both ES&S and Diebold make precinct-count optical-scan ballot tabulators using an oval voting target, where voters are instructed to fill in the oval in order to cast a vote. In my test of the ES&S Model 100 tabulator, it accepted as a vote a light pencil stroke through the center of the oval and discounted anything less. In contrast, the Diebold AccuVote optical scanners I tested required that the oval be filled completely before it was counted. In both cases, it is noteworthy that these machines will count, as a vote, a circle drawn closely around but entirely outside the oval, so long as it is sufficiently dark. TheOptech family of tabulators available from both ES&S and Sequoia use a different style of voting target, a divided arrow that the voter is instructed to connect in order to cast a vote. In my tests of the Optech III Eagle (a precinct-count machine), I found that it accepted a single lightly made pencil stroke and discounted anything less, but in testing the Optech 4C (a central-count machine), I found that it counted even a single

faint spot of pencil lead. Whether or not any of these machines is considered for use in New York, the variation documented above should be cause for very close scrutiny of the sensor calibration of any optical-scan systems that are used in the state.

59. Paragraph C, which provides for a public demonstration of the pre-election test, is not truly public. It does not provide for members of the public to be present at the demonstration, excepting a few representatives of political parties and the candidates. I would suggest that additional observers should be permitted unless a compelling case can be made that their presence would pose a problem.

60. Paragraphs E, F, and G appear to apply only to central count tabulation. That needs to be made explicit. Testing immediately before, during and following an official tabulation of ballots with precinct-count tabulators is definitely problematic. For precinct-count machinery, pre-election testing should be performed at the warehouse before delivery to the precinct, possibly several days before the election.

#### **Section 6209.13 Submission of Procedures for Unofficial Tally of Results of Election**

61. It is crucial for the standards to address the security of unofficial results. The standards must address the possibility of wireless communication, modems, Internet communication and other methods for rapid delivery of unofficial tallies and the security concerns associated with these methods. Simply because results are unofficial do not mean they are unimportant. In fact, if unofficial results are communicated incorrectly or if security is breached in the communication of unofficial results, these mistakes can create significant problems for the whole voting system. A security breach in the communication of the unofficial results can create public distrust in the official results. Poorly secured communication of the unofficial

results could permit remote access to the voting system, allowing someone to alter the official results before they are printed. I suggest that election procedures should require that the official results be printed before unofficial results are transmitted, and I would hope that voting system vendors would provide interlocking mechanisms to enforce this by preventing external data communication connections from being made until official results have been printed.

### **Section 6209.15 Demonstration Models**

62. The requirement in paragraph A that counties provide a model or diagram of that county's voting system's equipment for each polling place in its jurisdiction for only the first five years after purchase is too short a period of time. Census statistics suggest that the average American moves once every 7 years, although the variation between individuals is immense. *See* "Population: A Lively Introduction: How Often do People Move?," Population Bulletin Vol. 53, No. 3 (Sept. 1998). This implies that counties are constantly dealing with new residents who may be unfamiliar with the voting equipment used locally. Also note that, for many DRE voting systems, a real voting machine configured with a model election is the best model to use for demonstration. This rule does not anticipate this possibility and should consider it.

### **Three Main Issues the Standards Fail to Address**

63. The first issue the standards fail to address is requirements for precinct-count optical-scan ballot tabulations with respect to emergency ballot compartments. The standards ought to mandate that precinct-count tabulators be equipped with secure ballot boxes that are locked with a key and that contain emergency ballot compartments that separately lock for use in the event of machine failure. For example, in Iowa, we

require that precinct-count tabulators have three compartments. The first two are for normal ballots: one for ballots containing write-in votes and one for ballots that do not. The third compartment is the emergency ballot compartment, which is only utilized if the scanner breaks. Should the scanner break down, this compartment is unlocked by precinct officials and voters put their ballots there, at which point the precinct-count optical scanner becomes an old-fashioned ballot box.

64. The second issue the standards fail to address is the criteria to be used to evaluate the physical security of voting machinery. Minimum standards for security seals, locks and keys must be set. The standards for seals must address how easy they are to break and how easy they are to counterfeit. The standards for locks must address how easy they are to break and how easy they are to pick. The standards for keys must address how easy they are to duplicate which locks may be keyed alike or which may share a common master key. *See* ¶54 *supra*. It is clear that different seals and locks will require differing levels of security. Adhesive seals that can be broken with a thumbnail are appropriate where they are protected from routine handling, while voting machine access points exposed to the voter in the privacy of the voting booth need locks or seals that cannot be broken in a few minutes.

65. There is a widespread problem in the United States today relating to optical-scan voting systems. State standards for what marks are deemed accepted to count as a vote frequently bear little relationship to the marks the optical-scan vote tabulating equipment actually counts. None of the federal voluntary voting system standards require any documentation or testing of what marks an optical-scan vote tabulating will count counts; the only requirement is that it perfectly count perfect examples of the prescribed mark. Many states have failed to test that optical-scan tabulators

conform to state standards for what marks constitute votes. In several cases, voting machine vendors provide machines that are more generous than the state standards, in terms of what marks the machine will count as valid. For example, where the voter is instructed to fill in the bubble on mark-sense ballots in order to cast a vote, some states require that the voter's mark be at least partly inside the bubble to be counted. Most vendors, however, provide machines that will count a circle around the bubble as a vote.

### **Closing Remarks**

66. In my opinion, voting system standards cannot be written in a vacuum. Those responsible for promulgating voting system standards require expertise in voting systems, computer systems, security, and human factors in order to understand what standards are necessary and appropriate and how they can be tailored to have the best impact on each voter's franchise.
67. In my opinion, the proposed voting standards for New York that I reviewed were not the product of an expert advisory committee or other expert resource. New York State has excellent resources available to it on voting systems; it should bring those resources to bear in order to make real world voting system standards of which the voters of New York can be proud. I observe that, like New York, Connecticut is behind in its HAVA compliance, yet Connecticut has created an open public process for working through the issues and getting the right standards in place.
68. When states are pushed into adopting new voting systems within a short period of time, it is a recipe for disaster. I strongly recommend that no jurisdiction put a new voting system into service at such a time that its first use is in a major election. When

a new voting system is put in place for the first time in a general election, any mistake will have serious national consequences. Based on my extensive survey of and experience with such matters, requiring adoption of new voting systems within a short period of time leads to chaos. The problems in Montgomery County, Pennsylvania in November 1996 and in Miami-Dade County, Florida, in their August 2002 primary are good examples of what can happen if a county pushes for rapid introduction of new voting equipment with its first use in a major election. In both cases, a county acted in haste to put a new voting system in place on an accelerated timetable, and the result was, in one case, a major lawsuit, and in the other, a national outcry. Ideally, the first uses of new systems should be in low-turnout elections where the impact of the problems, if any, will be minimal.

69. In my opinion, the proposed regulations taken together, and in many instances taken alone, put the voting rights of the citizens of New York at significant risk.

FURTHER, AFFIANT SAYETH NOT.

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Douglas W. Jones

Subscribed and sworn to before me this \_\_\_\_ day of January, 2006.

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Notary Public