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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

AMERICAN ASSOCIATION OF PEOPLE WITH DISABILITIES,

Plaintiff,

v.

KEVIN SHELLEY,

Defendant

PETER BENAVIDEZ, *et al.*,

Plaintiffs,

v.

KEVIN SHELLEY,

Defendant.

Case No. CV 04-1526 FMC

SUR-REPLY BRIEF OF AMICI CURIAE ELECTRONIC FRONTIER FOUNDATION, THE CALIFORNIA VOTER FOUNDATION, THE VERIFIED VOTING FOUNDATION, AND VOTERS UNITE!

Date: July 2, 2004
Time: 2:30 p.m.
Judge: Hon. Florence Marie Cooper

Plaintiffs have taken the unusual step of replying to amici's initial brief, raising a number of new issues in the process. Amici maintain that the Secretary of State properly exercised his authority by placing additional security measures on those California counties that use electronic voting systems (DREs) without voter verified paper ballots in the upcoming November elections. We believe that these measures will increase election security, accuracy, and confidence. Amici have

documented serious problems with the basic functionality of DRE machines on election day,[1] as well as difficulties disabled voters have faced in their use of these early-stage machines.[2] Plaintiffs do not dispute the facts presented by amici, but instead seek to narrow the court's attention to intentional manipulation of election results. They argue that a second, independent record of votes cast on paper ballots will decrease the security of the election system. Plaintiffs also dismiss the reports from disabled voters who have had serious problems voting independently on current-model DRE machines, yet offer no contrary survey or polling data. Amici appreciate the opportunity to address these points.

A. DRE Systems' Reliability Failures Are Relevant.

The purpose of an election system is to determine the winner by gathering and accurately counting votes. Whether by malice or malfunction, if the wrong candidate wins the system has failed. Plaintiffs, however, attempt to restrict the scope of the inquiry to "actual or attempted security breach[es],"[3] dismissing the long and growing record of DRE failures as relating only to "reliability."[4] While resistance to intentional attack is critically important, it is no less important than ensuring that the election system functions properly in a benign environment. Reliable operation is the first objective of any widely-deployed technology, and, as amici have demonstrated, the reliability record of DREs is not encouraging. Five incidents resulting in significant voter disenfranchisement during the March 2004 primary in California, plus thirteen more nationwide in the past two years, call into question whether present DRE machines can be trusted to function properly even when not faced with

[1] Amicus Curiae Brief of Electronic Frontier Foundation ("EFF"), the California Voter Foundation, the Verified Voting Foundation, and Voters Unite! at 4-9 (May 18, 2004).

[2] *Id*. at 12-13.

[3] Plaintiffs' Reply to Electronic Frontier Foundation, the California Voter Foundation, the Verified Noting [*sic*] Foundation, and Voters United [*sic*] Amicus Brief at 3 (May 24, 2004).

[4] *Id*. (emphasis in original).

technically knowledgeable attackers. These failures alone are a sufficient basis for the Secretary of State to order additional security measures for the November election.

In addition to preventing DREs from accomplishing their primary mission, the wide variety of faults in current DRE systems run the very real risk of masking real security attacks. Since DRE systems fail frequently and unpredictably, there may be no way to distinguish between the many problems attributable to poor design and the one introduced through deliberate sabotage. Anyone seeking to undermine the integrity of a DRE system could hide in plain sight among the many other technical faults. The situation is not unlike a spurious car alarm that goes off so frequently that the neighbors ignore it, destroying its practical ability to protect against theft.

B. A Second Record of the Voters' Intent Increases Security and Reliability.

Amici suggest that an additional reason for supporting the Secretary of State's decision is the availability of election systems that include either: 1) DREs with a voter verified paper ballot, attaching a printer to a DRE to print out ballot so that a voter can review it but not access it,[5] or 2) optical scan systems that inherently create a paper record and can be made accessible for those with disabilities through the use of tactile ballot overlays or templates, such as are used currently in Rhode Island.[6]

Plaintiffs attempt to deflect these points by asserting that paper ballots are subject to manipulations by those who come into contact with the ballots or the ballot boxes.[7] While these arguments may have some validity when leveled at

[5] Avante's system using voter verified paper ballots, described by amici in their first brief, is now certified by the National Association of State Election Directors (NASED number N-1-12-22-12-001). *See infra* at pp. 6-7 for a more complete description of the voter verified paper ballot systems.

[6] *See* Amici Curiae Brief of EFF, et al. at 10.

[7] *Id*. *See* Declaration of Edwin J. Selker, Ph.D. in Support of Plaintiffs' Application for Temporary Restraining Order ¶ 3 (May 5, 2004)(paper ballots "will reduce the integrity of elections because it [*sic*] the ballot boxes can be compromised,"); Declaration of Michael I. Shamos, Ph.D., in Support of Plaintiffs' Reply ¶ 11(c)

systems that rely *solely* on paper ballots, they simply do not apply here and miss the main point of amici's argument: that two independent methods of confirming a voter's intent are better than one.

The goal of the systems presented by amici is to demonstrate that accessible systems can also be secure, and a key way to achieve this goal is to utilize one of the most longstanding and common-sense principles of general data security: two sets of books are better than one. Under systems that create two records of voter intent, destruction of a ballot box or altering of a paper ballot will no longer be enough to change election outcomes and detection of attempted vote fraud will be significantly easier. The same is true for malicious attacks on DRE software or insider manipulations of that software. Those seeking to alter election results undetectably will have two completely different kinds of records to forge – a more difficult task than forging only one. A discrepancy between the paper and electronic records serves as an indicator of problems with the election. Election results are highly trustworthy when both sets of books add up to the same answer.

Plaintiffs will undoubtedly argue that multiple records of the votes are stored internally in DREs. None of these redundant records have been verified by the voter, however, so in the case of error or attack, the redundant records simply replicate the bad information.

After listing problems that occur when only paper records exist, Dr. Shamos gives only one example specific to computer-printed paper ballots used in addition to DRE's internal records. He argues that a system with a paper ballot could be maliciously programmed to void already-printed ballots and print new, altered ones undetected.[8] But this claim is belied by the very architecture of voting systems using

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(May 24, 2004)("[p]aper records are subject to trivial manipulations by anyone who comes into contact with them"). The examples Dr. Shamos gives in his paper analogize to destroying, substituting, stuffing, and altering various forms of older paper ballots. Shamos decl., Appendix B § 2.3.

[8] *Id*. at § 2.4.

voter verified paper ballots. After the ballot has been printed and reviewed by the voter, it drops into a separate box out of reach of the voting machine.[9] Once the ballots have left contact with the machine, the computer system simply cannot physically pull the paper ballots back out of the box in order to alter them.

Prior to being hired by plaintiffs, Dr. Shamos expressed the same concerns about voting systems that create only a single record. In a 1993 article, he wrote:

> Suppose that the system presents the slate of candidates to the voter properly, but either through error or nefarious design randomly records a vote for the Republican senatorial candidate regardless of who was actually selected. Suppose further that it keeps a perfectly accurate audit trail of these incorrectly recorded votes and that it even does so redundantly so that all copies of the audit trail match exactly. How would you propose to reconstruct the election from this audit trail?[10]

Shamos now answers his own concerns by arguing that, since we can trust software to fly airliners without crashing, we should also trust it to run our elections for us.[11] Avionics software, though, is subject to stringent and repeated FAA review and auditing throughout the development process.[12] Its reliability is proven by consistent success in the laboratory and in the skies. In contrast, DREs are developed in secret

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[9] Rebecca Mercuri, *A Better Ballot Box?*, IEEE Spectrum Online (June 14, 2002) *available at* http://www.spectrum.ieee.org/WEBONLY/publicfeature/oct02/evot.html.

[10] Michael Ian Shamos, *Electronic Voting – Evaluating the Threat*, Proc. of the Conference on Computers, Freedom, and Privacy (1993) *available at* http://www.cpsr.org/conferences/cfp93/shamos.html.

[11] Shamos Decl., Appendix B § 1.1.

[12] Fed. Aviation Admin., U.S. Dep't of Transp., Order No. 8110.49, Software Approval Guidelines (2003), *available at* http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgOrders.nsf/0/640711b7b75dd3d486256d3c006f034f/$FILE/Order8110.49.pdf at 10 (p. 18 of the PDF)("Since RTCA/DO-178B [development of software for an aircraft or engine product] is process-oriented guidance, to be meaningful, the review process should be integrated throughout the software life cycle. This means that regular contact between the applicant and FAA … should be established. Regular contact should provide confidence in the software life cycle processes and the resultant product to both the applicant and the FAA").

with little regulatory oversight and virtually no auditing.[13] No one would ever board an airplane whose control software had a record of failure as troubling as that of present DREs.

Moreover, to the extent that there are security issues with the addition of paper ballots to DREs, they are the sorts of custody and integrity issues that electoral systems have long handled. Officials employ clear, transparent procedures for authenticating, verifying, and transporting paper records, taking long-established precautions to protect against exactly the sort of election fraud Shamos and Selker discuss. Attacks on any electoral paper trail, including machine-printed paper ballots, cannot be dismissed as "trivial."[14]

Moreover, computer-generated paper ballots can be made more secure than conventional paper records. California requires that the voter be unable to touch the paper ballot, preventing physical manipulation before it is secured in the box.[15] Designs for audit trail printing meet this requirement by placing the ballot behind glass or plastic. The voter can view the ballot, but cannot manipulate it other by issuing a command either to drop it into the ballot box or to correct it. To ensure that the ballot has not been altered after being cast, it can include a special authentication code called a digital signature. The signature mathematically binds the voter's choices to a number or letter code that can be printed on the ballot. Anyone with a computer can check that the choices match the code; no one can alter the ballot after printing without causing this check to fail.[16] These measures make computer-printed

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[13] Elise Ackerman, *Lax Controls Over E-Voting Testing Labs*, SAN JOSE MERCURY NEWS (May 30, 2004), *available at* http://www.mercurynews.com/mld/mercurynews/news/8797832.htm.

[14] Shamos Decl., ¶ 11(c).

[15] *State of California Standards for Accessible Voter Verified Paper Audit Trail Systems In Direct Recording Electronic (DRE) Voting Systems* § 2.4.1 (June 15, 2004), *available at* http://www.ss.ca.gov/elections/ks_dre_papers/avvpat_standards_6_15a_04.pdf.

[16] Avante Vote-Trakker (*see* http://www.aitechnology.com/votetrakker2/overview.html) uses this technique on its

paper ballots secure from the moment of their creation against forms of tampering that might have worked on older forms of paper ballots.[17]

C. Amici Have Demonstrated Real Problems with DRE Accessibility.

Plaintiffs state that amici's "questioning of the accessibility of DREs is unfounded,"[18] arguing that the sample of disabled voters is not large or representative enough. They do so without providing any contradictory scientific evidence to counter the experiences of persons with disabilities who had serious problems using DRE machines to vote independently both in the March primary and in the New York tests.[19] These reports show that in actual practice, disabled voters struggle with DREs. The record of the present generation of DRE machines shows a failure to deliver on promises of universal accessibility.

Plaintiffs blame poll workers for the problems experienced by disabled voters, arguing that accessibility problems "do not pertain to inherent qualities of DRE systems themselves…the substantial majority of the stated problems were directly correlated to the actions of poll workers…."[20] Like all technologies, DREs must be appreciated in the context in which they exist, however, and DREs require poll workers to understand and use this complicated equipment when assisting disabled voters. Perhaps poll workers who completely understand the technology in DRE machines and the extra features aimed at assisting disabled voters could help smooth the way for those voters, but this level of training is plainly not occurring and unlikely to occur in the future. Most poll workers are not computer experts and nearly all are volunteers. When real poll workers and real disabled people cannot

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audit trails to protect against forgery.

[17] Printed paper ballots also help to solve one of the election system's most well-publicized difficulties. Since they are generated by machine, they are neater and less ambiguous than ballots marked by human beings. They have no hanging chads to obscure the voter's intent during a recount.

[18] Plaintiffs' reply to *amici* at 5.

[19] Amici curiae brief of EFF at 12-13.

[20] *Id.*

work together to use these complicated machines as intended, the machines are not accessible.

CONCLUSION

Plaintiffs ask this court to overturn the Secretary of State's considered decision to require increased security measures for those California counties using DREs. In doing so, they ask this court to ignore documentation of serious problems with DRE systems, disregard an alarming number of unexplained electoral faults, and reject that the commonsense measure of adding a second set of books via a paper trail will increase the system's security. They also ask the court to disregard the reports from actual disabled voters using DREs in the recent March elections and in tests elsewhere, yet offer no counter surveys. Yet these points plus those raised by the Secretary of State himself were a sufficient and reasonable basis for the Secretary of State to decide to order increased security, including offering voters the option of voting on paper in November. That decision should stand.

DATED: June 21, 2004

ELECTRONIC FRONTIER FOUNDATION

By _____

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PROOF OF SERVICE

I, Barak R. Weinstein, declare:

I am employed in the City and County of San Francisco, California by Electronic Frontier Foundation at 454 Shotwell Street, San Francisco, California 94110. I am over the age of eighteen years and am not a party to the within cause.

On June 21, 2004, at the above-referenced address, I served:

SUR-REPLY BRIEF OF AMICI CURIAE ELECTRONIC FRONTIER FOUNDATION, THE CALIFORNIA VOTER FOUNDATION, THE VERIFIED VOTING FOUNDATION, AND VOTERS UNITE!

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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

DATED: June 21, 2004

BARAK R. WEINSTEIN