

# VOTING ON *THIN* ICE

How systematic voting failures  
are a real threat to our democracy

An analysis of voting problems and vulnerabilities  
within Shelby County (Memphis), Tennessee

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## VOTING ON THIN ICE

This report pulls back the curtain from the voting systems in Memphis and Shelby County, Tennessee to reveal the truth that voting systems across our country are vulnerable at multiple points in the voting process. The Shelby Advocates for Valid Elections (“SAVE”) began its work in 2012, long before the recent reports of interference in our presidential elections.

We have uncovered many weaknesses and vulnerabilities which may apply in other counties. We are not computer experts, and do not attempt to provide a technical analysis. Rather, we observe how these machines are used in real life in one particular county, and open the door so others can learn about systematic problems that ‘common sense’ says could lead to inaccurate results, disputed elections, and a decline in voter confidence in the electoral process.

Everything in this base report is backed by objective documentation from open records requests and other original research from our own investigation<sup>1</sup>.

We are describing a system with problems which leaves our democracy vulnerable because similar machines, software and processes are used in counties across the country.<sup>2</sup>

Here is an overview of these vulnerabilities we found in the system:

1. From our experience, there is a culture such that the local election commission officials disregard research and advice of the nation’s computer experts and ignore problems discovered and fixes applied in other states.
2. There are many vulnerabilities in the system beyond electronic hacking. We observed that it would be very simple for a bad actor (internally or externally) to gain access to the

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<sup>1</sup> A summary of documents and data reviewed is attached as Exhibit [“Exb.”] 1.

<sup>2</sup> <https://www.brennancenter.org/analysis/fact-sheet-voting-system-security-and-reliability-risks>, Exb. 2.

machines and compromise the integrity of the software, servers, etc.

3. Voter verified paper trails are essential to allow the system to be properly checked.

Furthermore, some machines have a reproducible record that is never printed out even though they are kept internally for years. Candidates and the public are unable to examine the internal machines and software. This practice goes against the traditional practices that were used, prior to computerized voting machines, when the mechanical machines could be checked for malfunction.

4. Machines are vulnerable to hacking because:

- a. They may be connected to the county government office.
- b. They may be connected to the internet.<sup>3</sup>
- c. Lack of control of memory cards, could allow the cards to be re-written, thereby leaving the system vulnerable during uploads.
- d. A security audit of the system does not exist, or is inadequate, to validate who has access to the computers, when no one else is looking.
- e. Election results and databases may be electronically sent, even to contractors out of the country.
- f. Local election personnel often lack the expertise or interest to deal with external electronic attacks: (i) they are too dependent on the vendor for everything from the ballot build to troubleshooting; (ii) they may insecurely transfer data back and forth; (iii) they are not knowledgeable about many system components, such as internal images of ballots stored even though referenced in the manual; (iv) they ignore the security risks of operating systems on old Windows platforms without security

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<sup>3</sup> Officials believe VPN systems are “safe” from outside attacks.

patches and updates; (v) they continue to rely on a vendor who no longer holds the intellectual property rights to the system and is precluded from changing the system.

5. An independent check of the software is not done on a timely basis to make sure there is no danger of rewritten software code, or the presence of editing software. Nor, are there independent checks for updates of software of the election system.
6. Election Commissions may use uncertified or outdated programs provided by independent contractors, and ageing voting machines may not properly record votes due to calibration issues.
7. Paper copies of election raw data can be destroyed or 'lost'.
8. State and federal laws do not require audits of machines, software, and programs.
9. From court reported decisions, it is clear that current laws on election challenges and recounts are ill-suited for the electronic age where an entire state's results can be altered in minutes without leaving a trace behind. Rather than a challenger having the burden to demonstrate the possibility of a dysfunctional election, election officials should be charged to show and explain the validity of their results before certification. There should be full disclosure to the public of any "glitches", problems, and errors.
10. More attention needs to be given to adopting standards for election administrators, including training and continuing education. The nation needs to develop a cadre of impartial, professional election administrators.
11. A process needs to be in place for oversight of election vendors who have written the source code for scripts used in the voting process. They also often have access to confidential voter information and data, especially with regard to the transmission of such data during the election process. This should also include local contractors.



12. The certification system is too rigid and costly yielding a practical inability to update and apply security patches to the underlying computer operating system and a failure to test the effects on operating system-election software interfaces. This results in a cumulative exposure of computerized voting systems to all the security vulnerabilities of the operating system compounded by the ageing of the machine. So machines purchased in 2006 are now exposed to all the security vulnerabilities otherwise patched by Microsoft in the last 11 years.
13. Confusion created by computer glitches can result in certification of an election with incomplete results. The rush to report results on election night, and quickly certify the vote, with rigid contest rules may deprive candidates of the ability to contest an election when there is merit.

## **OFFICIAL INITIAL FINDINGS AND RECOMMENDATIONS OF THE SHELBY ADVOCATES FOR VALID ELECTIONS (“SAVE”)**

This is the research and overview for a five year project by a group of citizens examining electronic voting machines and election processes in Shelby County, “Memphis”, Tennessee [Accuvote TSx- GEMS 1.18.24]. We utilized interviews, open records requests and observations. Our conclusion as citizens is that a person can easily alter the elections with very little difficulty. Shelby County’s server tabulates and reports approximately 17-24% of the Democratic vote and 8-12% of the Republican vote in statewide elections in Tennessee.<sup>4</sup> Thus, Shelby’s server is critically important in determining the outcome of statewide elections.

### **SUMMARY OF FINDINGS**

There are several critical observations:

- On at least two occasions in Shelby County either additional memory cards were uploaded before the polls closed on election day without notice and explanation to candidates and the public, or not all memory cards were uploaded which may impact on the final results.
- On at least one occasion the election results database was sent by an insecure method to the election vendor (perhaps even to Canada).
- The use of a second database in at least two elections concomitant with complications raises security issues.

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<sup>4</sup> Tennessee Secretary of State website, <http://sos.tn.gov/products/elections/election-results#2016>;  
<http://www.politico.com/2016-election/results/map/president/tennessee/>

- On at least on two occasions Shelby County (Memphis) voting machines were connected to the Shelby County Government IT which according to experts can allow for hacking.

- Passwords have not been properly handled.

- An official state report found unauthorized editing software on the Shelby County Election Commission [“SCEC”] system.

- There are improper controls to ensure that an unauthorized memory card is not utilized during the election process.

- In one election an unknown number of voters were disenfranchised when the wrong database was uploaded; in another, thousands of voters were misassigned to the wrong precinct school board, legislative district, or congressional district violating their respective rights to elect their own government officials. In other elections blocs of voters were misassigned to their city of residence preventing them from voting on local referenda. The local election commission officials admit to altering voter records and destroying work notes when correcting official records in one election, despite objection of officials.

- Security for the voting machines is inadequate providing opportunities for someone with training and skill to insert malicious code to alter the election results.

- Best practices are not followed for pre-election testing, parallel testing, and post- election audits. There have been multiple occasions when incorrect shifting of blocs of voters failed to be detected by either pre-election or post-election testing.

Sometime after 2012, the contract with the independent accountants was weakened from an audit to a work-product engagement. The accountants were instructed not to

justify all of the precinct totals with the electronic tabulation preventing an independent check on the tabulator.

- The lack of independent election voting machine and tabulator inspection, complete audits, proper maintenance of poll tapes and other election data, election process monitoring, and verifiable paper trail, make the election results insecure and susceptible to manipulation, or even hacking.
- On more than one occasion local election officials pushed forward with certifying the reported election results despite reports of incomplete data.



## SUMMARY OF INITIAL RECOMMENDATIONS

1. Prohibit the use of all legacy Direct Recording Electronic voting (“DREs”) machines for the 2018 federal elections forward.
2. Recommend the use of paper ballots with optical scanning pending the development of alternate systems.
3. Prohibit by federal law the connection of voting machines, tabulators, etc. to any internet link.
4. Require regular independent and random audits of election voting machines, software, tabulators. Allow candidates to have their own experts inspect the same prior to use in the election or any other outside device or network, including Virtual Private Network (“VPN”) connections
5. Require every election to have a statistically sound audit prior to certification. Require complete audit of all poll tapes with voter sign-in sheets, voter ballot applications, and printed tabulator results. Rather than waiting for candidates to challenge results, election commissions must demonstrate that the election results are valid. Current recount laws fail to account for the need for inspection of modern electronic voting systems, machines, software, servers and tabulators to find evidence of errors or tampering that could alter the results.
6. Back-up data for the election; print out all poll tapes (including early vote); copy and scan (as they sometimes deteriorate); and require them to become permanent records under federal law as constitutionally permitted.
7. Require passwords to the voting apparatus and systems to be confidential, and timely

changed.

8. Direct the DOJ and FBI to promptly and fully investigate reports of wrongdoing, or referrals for election problems (subject to jurisdictional authority).
9. Establish national standards to professionalize voting personnel such as state and local election administrators.
10. Require background checks for all election workers-permanent and temporary volunteers, IT software vendors, programmers, and consultants.
11. Require state officials to develop voting process guidelines that insure the integrity of the election, with regular inspections of documents verifying the chain of custody of all memory cards or other ballot forms; independent monitors at zone turn-in sites and the tabulator; regulations re: leaving and returning to the election voting room during the election counting process; and unalterable audit logs made public.
12. Require timely reports to candidates and the public, and investigation as warranted, of glitches, anomalies, addition of databases and/or voting machines, discrepancies in reported results, voter complaints, broken seals on equipment, opening of voting machines by vendor and/or election personnel (with candidates' experts permitted to observe), etc.

## OVERVIEW OF ELECTIONS SYSTEMS IN SHELBY COUNTY

The Shelby County Election Commission [Memphis, Tennessee area] uses “Election Systems Manager (ESM), a voter registration application that interfaces with the Global Election Management System (GEMS) for election preparation and set-up, to capture pertinent data relative to voter registration and election officials, and as a reporting function for election data”.<sup>5</sup>

The GEMS 1-18-.22 was certified by the Tennessee Election Commission on January 11, 2006. Exb. 4. The Diebold RFP Response to the Shelby County Government [“SCG”] dated December 12, 2005 states that the vendor Diebold Elections Systems, Inc. was in the process of applying to the State for certification of the GEMS software version 1.18.24 upgrade. Exb. 5. The Diebold contract with SCG further has a large “X” marked through negating provisions that require that Diebold ensure enhancements and upgrades are fully certified by the State of Tennessee<sup>6</sup>. (Contract, Exb. 6, pg. 12).

On December 1, 2015, the minutes of the Tennessee Election Commission reflect that the Diebold/Premier/ES & S Gems 1-18-.22 was recertified. Exb. 7. On July 8, 2013, the Tennessee State Election Commission approved list of voting machines only identified the Diebold/Premier/ES & S Gems 1-18-22, with no mention of Gems 1-18.24. Exb. 8. The SCEC presently uses GEMS 1-18-.24<sup>7</sup>, and while there is reference in the State Election Commission minutes to new license certificates for GEMS SSL transmissions in 2013, no record has been

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<sup>5</sup> Shelby County Government, “*Shelby County Election Commission Internal Control Study*” Internal Audit Report No. 13-011, Nov. 4, 2013, Exb. “3”, pgs. 5-6.

<sup>6</sup> The X also marked out the contractual provision requiring SCG to incorporate enhancements and upgrades received from Diebold within ten (10) days.

<sup>7</sup> SCEC Interrogatory Response, No. 13, Exb. 9; Exb. 72, 93:3-5.



provided of the certification of GEMS 1-18-.24 by state officials despite open records requests.<sup>8</sup>  
Exb. 10.

While the machines contain both a DRE and Precinct Based Optical Scan solution, a July 20, 2006 letter of the Tennessee Coordinator of Elections states that the certification of the Accuvote TSx touch screen voting machine bearing the NASED No. N-1-06-22-22-003, “does not apply to any voter verified paper trail software contained in the above mentioned voting machine or in the updates presented for certification.” He states “Realize that Tennessee has not certified the use of the voter verified paper trail technology”. Exb. 11. Thus, it is not used in Tennessee, even though the SCEC machines are designed to have that feature<sup>9</sup>.

In January 2010, the Shelby County Government entered into a license agreement with Accenture LLP to “use the source code for ESM (“Source Code”) from Accenture, stating that “the County desire to modify and prepare derivative works based upon the Source Code and otherwise use the Source Code in support of its internal purposes”<sup>10</sup>. Exb. 14. It is unknown what modifications have occurred, and the Tennessee Elections Office has not produced any documents verifying that such modifications were ever certified. Exb. 10. The ESM is no longer supported by the vendor, and instead the SCEC relies upon an independent consultant who

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<sup>8</sup> One IT professional consulted advised that .24 can not be certified now because the Windows platform is obsolete and the most vulnerable now. The Accuvote-TSx Touch Screen voting machine bearing NASED No. N-1-06-22-22-003 was certified by the State Election Commission on June 8, 2006, but that is related to GEMS .22 and not .24. Exb. 10. On October 2, 2008, State Election Commission minutes reflect that the Premier’s Express Poll 5000 Electronic Poll Book with NASED No. 1-06-22-22-004 was approved which does relate to GEMS .24, but no record of certification of the GEMS .24 has been produced. Exb. 12.

<sup>9</sup> See letter of Holly Quick (citizen) to Tennessee State Election Commission dated 6/9/06 asking it to certify the Diebold GEMS 1-18-.24 system; Accuvote TSx precinct counter with AVPM printer and AccuVote TS R 6 4.6.4; NASED number N-1-06-22-22-002. Exb. 13.

<sup>10</sup> According to an email of SCEC Administrator Holden in 2012, Shelby County purchased the source code for its Voter Registration software from Accenture. The system was originally sold by CMIS from Russellville, Arkansas. Shelby, Wilson and Sullivan purchased the VR system. The company was then sold to [Election.com](http://Election.com) and later purchased by Accenture. Accenture decided to get out of the elections business due to inconsistent cash flow and excessive litigation. Shelby County then purchased the source code and located support vendors for the VR system in 2000. Exb. 15.



resides out of state. Exb. 16, pg. 3. In fact, in a 2015 RFQ for Replacement of Election System Management Software, the County states that “the absence of vendor support for the critical and obsolescent software presents an unacceptable risk to the election delivery capability and operation of the election commission.” Exb. 16, pg. 3.

The Shelby County Election Commission also uses the Accuvote-TSx R7 voting devices.<sup>11</sup> Exb. 17. “Results are stored to both an external PCMCIA memory card as well as internal flash memory”. Exb. 19, [Overview]. “All election information specific to the vote center, including races, candidates and ballots are programmed onto PCMCIA memory cards from GEMS. The PCMCIA memory card acts as primary storage location for the AccuVote-TSx, with the internal flash memory acting as secondary, backup storage. In the course of voting, all ballots cast are stored on the memory card as well as internal flash drive memory. “. Exb. 19, 2.2.3. “Memory cards and AccuVote-TSx units are interchangeable; the Accuvote-TSx assumes the identity of the currently active election on any installed programmed memory card.” Exb. 19, 2.2.3 Smart cards are used for each voter to record his or her votes on the voting machine. Exb. 19, 2.2.4.

Initially, the SCEC stated in court filings in an unrelated election contest, that ballot images of the votes could not be produced for any given election.<sup>12</sup> Exb. 20. However, after an almost 9 month argument between the SCEC and Weinberg, and after referencing the emails between the Deputy Administrator and ES & S which verified such images were available in the groups’ open records requests, its lawyers finally produced digital ballot images for a District 5

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<sup>11</sup> A chart prepared by Dr. Joseph Weinberg on various problems reported from other states with similar voting systems is attached hereto as Exb. 18.

<sup>12</sup> Interrogatory Request for Production No. 44: “Digital copies of the following files from all defendant’s computers: All TSx Ballot definition files; All TSx Ballot images”. Answer: “As far as the Defendant understands, these files are generated and utilized internally in the TSx machine and are not retrievable.” Exb. 20.

Memphis City Council race.<sup>13</sup> Exb. 21, No. 4. An example of the digital ballot image is attached hereto as Exb.23. SCEC officials appeared completely ignorant of this machine capability and to the best of our knowledge the images have never been used for recounts, audits or quality control in Shelby County.<sup>14</sup>

After the polls close, the memory cards for each voting machine can be inserted into one machine to accumulate the votes from that precinct. Exb. 19, 2.2.5. Each voting machine has a “modem” “which may easily be removed from the unit base”, and then “connect the telephone jack located within the Ethernet PCMCIA slot on the tablet to a wall phone jack”.. for uploading results. Exb. 19, 2.2.6. Exb. 25, 2.2. The practice for the SCEC has been for the memory cards to be brought to five or six Zone Turn-in Sites on election night, and then uploaded to the GEMS system. The memory cards can also be brought to the Election Offices for uploading, and tabulation.

### **OPEN RECORDS PROCESS**

In 2003, Mike Kernell and Carol Chumney as state legislators, grew concerned about the inability to inspect software for the new electronic voting machines. Kernell even expressed his concerns in the *New York Times* newspaper. Exb. 26. They advocated for the state legislature to study the issue, and also asked to inspect the software during the appropriate time at the SCEC, and were denied. Dr. Joseph Weinberg has also advocated for years for paper trail voting

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<sup>13</sup> The group has been advised by an unidentified source that the AccuVote machines keep all of the historical votes cast on them, for 20 or 30 races ( as many as the machines’ internal memory will hold), and that these votes are held on internal memory as each individual election’s results are firewalled off from each other by a cryptographic function. The records stay permanently on the machine even after the machines are used for other elections. In the Diebold Election Systems Accuvote-TSx Hardware Guide, it states older election files are automatically deleted from internal memory in the case the internal flash memory is short of space. Exb. 22, No. 2.2.3.

<sup>14</sup> See email exchange between Dr. Weinberg and the SCEC Administrator in April 2013. Exb. 24. We do not know whether election machine software tampering could alter the digital images.

machines as a private citizen and spoke out about the devastating critiques of the Diebold software published by scientists from Johns Hopkins<sup>15</sup> and Rice Universities prior to the county's decision to purchase the Diebold system for the 2006 elections.

This group began work after the August 2, 2012 elections wherein thousands of Memphis and Shelby County citizens were given the wrong ballot. Rep. Mike Kernell was on the ballot for reelection to the Tennessee House of Representatives, and Carol Chumney for the general election for Shelby County District Attorney. No lawsuit was filed by them related to the election, although another candidate for school board did file a lawsuit. The Shelby County Chancellor ordered a new election for Kenneth Whalum, Jr. due to many voters being given the wrong district ballot, but this was later overturned on appeal.<sup>16</sup> Tennessee law is very limited in terms of the judicial review permitted of the elections process, with a high standard required for the plaintiff.

Dr. Joseph Weinberg discovered and alerted the SCEC about the voters being given the wrong ballots as early as July 18, 2012 during early vote. Exb. 27. It was also notified by a candidate for County Commission—Steve Ross. Exb. 28. Weinberg provided data and analysis of over a thousand voters being disenfranchised to the SCEC and state officials. Exb. 29. However, the SCEC Election Administrator initially ignored Weinberg's warnings and delayed action until the state Election Coordinator validated the findings and intervened in the process. Exb. 30.

When action was finally taken to correctly assign the misassigned voters, Weinberg noticed that the official voter records were being altered during the process so as to appear that

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<sup>15</sup> See "Analysis of an Electronic Voting System", *IEEE Symposium on Security & Privacy*, 2/27/04.

<sup>16</sup> *Kenneth Whalum v. Shelby County Election Commission*, 2014 Tenn. App. LEXIS 612.



the misassigned voters voted in the correct district. Once again, Dr. Weinberg notified the SCEC, State Election Coordinator, and the public. Exb. 31. He was informed by state personnel that the County was provided a method to place voters in their correct districts while avoiding altering the record, but it was not followed by the SCEC Administrator. Even one SCEC Election Commissioner was “appalled to read that the participating voter list is being changed to reflect votes in districts that the voter didn’t actually vote in”, and queried whether that would “corrupt” the list. Exb. 32.

Weinberg continued to provide data. Exb. 33. Disenfranchised citizens reported being given the incorrect ballot, with one saying she voted in two school board district races although only one should have been on her ballot. Exb. 34. One suburban municipality had citizens unable to vote in a school funding referendum. Exb. 35. Several state legislators wrote a joint letter to state election officials calling for an investigation. Exb. 36.

As a better way of getting to the bottom of what happened, on August 6, 2012, Rep. Kernell, Carol Chumney, and a constituent who had been initially given the wrong ballot, met with two FBI agents, and Mike Soltana [FBI Election Coordinator] at the Memphis office, to request an investigation of the recent problems with the electoral process. A follow-up letter was sent by Carol Chumney to the DOJ: Public Integrity Section [Washington DC] on August 7, 2012, about the disenfranchised voters given the wrong ballot, reported concerns about vote-flipping, and publicly unreported information about 132 election commission poll workers having to pick-up microchips from the Election Commission annex, and receive training on election night for the insertion of the chips into the electronic poll books. Exb. 37. The DOJ was asked to investigate, in part, because the U.S. Attorney for the Western District of Tennessee had a conflict of interest in that his father was on the countywide ballot in that election. At some



point, Chumney received notification from the DOJ that the FBI was the agency that would be responsible for any investigation.

Chumney also called and emailed the Tennessee Elections Coordinator on August 14, 2012 reporting the above and asking that the votes be counted by an independent person/entity. He advised her that he could not rule out that the problems with the SCEC might be intentional, and referred to the problems in the 2010 SCEC election. Exb. 38. However, he said that the state had no authority to conduct an independent audit of the results. The Tennessee Secretary of State, Tre Hargett, did refer the matter to the State Comptroller. Exb. 39.

Hargett wrote that at least a thousand voters had been given the wrong ballot as of that date for the August 2012 elections.

In the July 2012 letter, Hargett states:

These recent issues are just the latest in a series of errors in the Shelby County Election Commission stretching back at least a decade. Nearly every election cycle in the county in recent memory has been plagued by a myriad of errors and complaints of wrongdoing.

...In 2010, an election official loaded the wrong information onto an electronic poll book which indicated that thousands of individuals had already cast a ballot when they in fact had not. In 2006, candidates sued the county election commission alleging that irregularities had affected the outcome of the county general election. A 2005 special election to fill a vacant seat in the Senate was voided based on a showing that ineligible felons and deceased individuals had voted in the election.

...together [these examples] indicate a troubling pattern of errors that cannot go unnoticed. These errors have eroded public confidence in the Shelby County Election Commission. Exb. 39.

The SCEC Administrator Holden was suspended briefly in September 2012 and placed on probation. Exb. 40. News reports in October 2012 confirmed that over 3,000 voters had been given the wrong ballot. Exb. 41.

In November 2012 elections, more problems were reported. According to Dr.

Weinberg, the SCEC chairman gave personal assurances to the City Attorney that all the records would be cleaned up in time. Some voters were wrongfully turned away at the polls due to being labelled “inactive” voters; one voter reported being given a ballot without a gas tax referendum; an internal poll watcher reported that the SCEC internal system showed 801 had voted at one precinct but the total accumulator only showed 293 votes; and others were not allowed to vote although timely submitting voter registration forms. Exb. 42. More voters were found to be listed in the wrong district. Exb. 42. In addition, an entire Memphis neighborhood was placed in the County outside the City and denied the right to vote in the city election. Exb. 42.<sup>17</sup>

Dr. Weinberg presented his own analysis in January 2013 to the SCEC showing that the County had removed 34% of the errors in the County voter files for the August 2012 election. Exb. 44. At the end of the Early Vote on July 31<sup>st</sup>, Dr. Weinberg had reported 4136 errors. According to his analysis, there were actually 5794 district misassignments for a 9.3% error rate for the entire election. Exb. 44. Despite assurances to the public that all was fixed, he found there to be a 4.6% error rate on election day. Exb. 44.

In January 2013, Richard Holden testified under oath in a lawsuit that notes and communications between election commission staff with regard to the street block range assignment of voters (that were one of the errors that lead to erroneous voter assignment) were destroyed during the early voting period, although he claims the software retained all records. Exb. 45.

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<sup>17</sup> Dr. Weinberg uncovered voters misassigned precinct as well in the August 2014 elections and notified the SCEC and Shelby County IT. Exb. 43. He recommended a proactive approach for presentation to the public that County IT verify that all voters were properly assigned, which was misconstrued and disregarded. Exb. 43.

The audit from the Tennessee State Comptroller only focused on the early vote period and redistricting without any inspection of the voting machines, tabulators or review of other complaints. Exb. 46. One Shelby County Election Commissioner commented in an email that the auditor spoke to people, but to her knowledge “didn’t review anything”. Exb. 47. She added that she did not believe “they know how to start looking at election issues”, and that she would request the DOJ to intervene. Exb. 47. Kernell wrote a follow-up letter to the Comptroller asking questions about the limited scope of the investigation. He received a cursory response the next day that “We limited the scope of the review based on the time and resources we had available. The report speaks for itself”. Exb. 47.

In March 2013, Dr. Weinberg followed up with Tennessee Secretary of State Tre Hargett about the November 2012 problems of voters receiving the wrong ballot, and the Comptroller’s lack of serious and thoughtful response to Rep. Kernell’s letter (or recommendations). In the letter, Dr. Weinberg begged Hargett to request the Comptroller or other consultant with the necessary computer expertise to perform a thorough evaluation of the SCEC. Exb. 48.

In October 2013, Dr. Weinberg, wrote a report to the Shelby County Election Commission asking that the voting machines be replaced as outdated and possibly not up to federal standards. Exb. 49. He also questioned whether the machines had ever been updated for security purposes. Exb. 49. Despite discussing purchasing new machines and that federal money was available, the SCEC did not take action.<sup>18</sup>

Thereafter, we began open records requests in November 12, 2013 to gather more information about what had happened in the August 2012 elections. Exb. 51. Weinberg also publicly called for the voting machines to be inspected by experts, a public accounting, and

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<sup>18</sup> *The Commercial Appeal*, “Election Commission Looking at Problems” Jan. 20, 2013. Exb. 50.



verifiable paper trail voting machines. Exb. 52. He continued to press local and state election officials about the altering of voter records, inadequate investigation and audit, and lackadaisical response of the Administrator to promptly addressing errors in order to ensure voting integrity. Exb. 52.

In January 2014, it was reported that the FBI was investigating and interviewing Holden who had received votes of “no confidence” from the Memphis City Council and the Shelby County Commission. Exb. 53. Apparently the FBI investigation was related to an internal county audit which addressed the failure to process many voter registration applications timely, and the handling of cash-receipting process. Exb. 53.

Meanwhile, the group continued to submit open records requests in order to get to the bottom of what happened in the 2012 elections. New irregularities were reported by a candidate in the Democratic primary for County Commission in August 2014, where all poll tapes were not printed out on election night. Exb. 54.

With more information in hand from the open records produced, in August 7, 2014, Carol Chumney spoke with the Asst. U. S. Attorney for the Western District of Tennessee, Leetra Harris about the need to monitor the tabulation of the votes on that election day when U.S. Department of Justice monitors were in town.<sup>19</sup> She also wrote Harris, the DOJ: Public Integrity Section, and the FBI again (forwarded that day) about the need for an investigation. Exb. 55. The letter relies, in part, upon the July 26, 2012, letter of the Tennessee Secretary of State Tre Hargett to the Tennessee State Comptroller.

As explained in the August 7, 2014 letter to the DOJ, the Tennessee Comptroller did

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<sup>19</sup> Chumney had been appointed by the Shelby County Democratic Party to serve as the lawyer for the day to represent the party in any election irregularities.



conduct an audit in response to Secretary Hargett's letter. Exb. 55. However, it only focused on the early vote period and redistricting efforts, without any inspection of the voting machines, tabulators, or other complaints. Exb. 46. Nonetheless, the Comptroller concluded that: The primary responsibility of the SCEC is to conduct elections in Shelby County, yet SCEC has demonstrated an inability to conduct elections without significant inaccuracies, including those identified in the 2012 elections. No suggestions for changes were made. Exb. 46, pg. 6.

The SCEC had ignored the report. Mr. Holden provided the commission with his response. Exb. 56. The commission only discussed a few of his comments and made no effort to independently verify the facts. According to Dr. Weinberg, no attempt was made to determine the actual cause of the failures and there was a lack of any control to detect problems before they appeared "live" on the ballot. This has been a repeated pattern. Poor internal controls allow errant ballots to go "live". Mistakes are only found when voters complain. For many of the voters, their voting rights have already been trampled upon and cannot be retrieved. In August 2012 had the SCEC partnered with Dr. Weinberg, it should have been possible to identify the voters at risk to receive errant ballots and notify their respective precincts. But the SCEC never contacted Dr. Weinberg. Instead, the commission kept sending out false messages of reassurance to the public that the problem was limited to two precincts, or was well contained. The commission refused to take the option of informing the public to double-check their voting districts before they voted.

The August 7, 2014 letter to the DOJ, Asst. U.S. Attorney, and FBI detail many of the findings from the open records (set forth in more detail below) regarding 20 extra memory cards

uploaded for the precinct COR 09 *before* the polls closed on August 2012 election day;<sup>20</sup> the fact the database was sent from the election software vendor and no results were found; it was then said to be sent to Canada for research; the election was certified prior to the solution being identified; an ESS technician had access to the tabulation server without any supervising SCEC employee; and many other documented irregularities (further set forth below). Exb. 55. Since federal monitors were present on that day in Memphis, Chumney asked for an audit and investigation, inspection of the voting machines by a computer and elections expert—especially with regard to tabulation issue. Exb. 55.

Chumney followed up on August 27, 2014, with a letter again to the Asst. U. S. Attorney, DOJ: Public Integrity Section, and FBI, setting forth again the 20 extra memory cards uploaded at COR 09 in August 2012 before the polls closed, which also was the precinct identified by ESS as causing problems with certifying the results some 19 days after the election. Exb. 59. Also, she references an August 25, 2014 article in *The Commercial Appeal* which quotes the SCEC Chairman as saying that the two federal monitors in town *did not* observe or inspect the tabulation process on August 7, 2014, although it had been expressly requested in Chumney's letter. Once again, the citizens requested a forensic evaluation of the voting machines, tabulators and computer data. Exb. 59. No one from the DOJ, or FBI ever contacted Chumney thereafter to discuss her 2014 letters, or the information provided.

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<sup>20</sup> Under Chapter 1360-02-13-.-.31, Tennessee Electronic Voting Machines Rules and Regulations, "*After the close of the polls on election day*, the registrar and the absentee counting board in the presence of those members of the county election commission who are present, shall verify and record the public counter number and protective counter number and verify, record, and remove the numbered case seal and shall verify, record and remove the "CLOSE POLLS" seal. The "CLOSE POLLS" button shall be pressed to ensure no additional votes may be cast on the machine. The printer door seal shall be verified, recorded and removed. The cartridge may then be removed from the machine and mechanically read and printed to retrieve the votes cast. The paper tape may be removed from the machine and filed with other early voting documents." (emphasis added). Exb. 57. The SCEC Resolution adopted in 2009, also sets forth procedures that early vote results uploads start at 7:00pm. Exb. 58.



In 2015, more election irregularities were reported regarding some voters being given the wrong ballot in a City Council district race, and all memory cards not uploaded in the Shelby County General Session Criminal Court Clerk's election.<sup>21</sup> Chumney and the group submitted additional open records requests related to this election, the August 2012 election and others, this time including requests to the Tennessee Election Coordinator, and the Shelby County Court Clerk.<sup>22</sup>

On August 31, 2016, Chumney wrote separately, Bruce Gear, with the DOJ Voting Section [Washington DC], and Raymond Hulser, Chief, DOJ: Public Integrity Section [Washington DC] detailing the prior letters, advising of the 2015 October new election irregularities with admitted vote total switching on televised returns, and some voters once again given the wrong ballot. Exb. 61. The letter further mentioned the reported approximately 100 vote variances noted up or down in some races from the audited results<sup>23</sup>. In addition, from the open records requests it was proven that several memory cards were not read on election night, with no mention by the ESS vendor of incomplete uploads. Exb. 61 [and set forth below]. A lawsuit was filed by a candidate in the Shelby County General Sessions Court Clerk's race where a citizen had taken photos of poll tapes at an election day poll which differed from the unofficial reported results.<sup>24</sup>

The letter to Gear and Hulser, further advised of an ESS report to the SCEC in 2013 that the tabulation server room was not secure, and had been plugged into the county network

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<sup>21</sup> <http://www.vibincblog.com/boot-holden/>; <http://wreg.com/2016/01/26/wanda-halbert-election-commission-appear-in-court-over-election-results/>

<sup>22</sup> A sampling of the open records requests and responses are attached as Exb. 60.

<sup>23</sup> The problem with dropped votes was innate to the system according to the president of Premier Elections (new name given to their elections division by Diebold); see "Touchscreens can't be fixed before the election, Bruner says", *The Columbus Dispatch*, 8/21/08, & Premier Memo, 8/21/08, Exb.62.

<sup>24</sup> *Wanda Halbert v. Shelby County Election Commission*, Shelby County Chancery Court, No. CH-15-1448.



exposing it to hacking, virus and malware. Exb. 63. This occurred despite a 2007 official state report that raised the same concerns with regard to Shelby County, as well as unauthorized software on its system that could allow manual editing of the GEMS database file and election results. Exb. 64 [Appendix A]. The Chumney letter asked what the FBI had determined from the prior letters of 2012 and 2014, and again asked for action. Exb. 61. She did not receive a response.

The group has continued open records requests thereafter, and its work has been reported in *Bloomberg Businessweek*.<sup>25</sup> Exb. 65.

## FACTUAL SUPPORT FOR FINDINGS AND RECOMMENDATIONS

**I. On at least two occasions in Shelby County either additional memory cards were uploaded before the polls closed on election day, or not all memory cards were uploaded without notice or explanation to the candidates and the public which may impact on the final results.**

### A. August 2, 2012 Election

There were 30<sup>26</sup> memory cards uploaded for a Shelby County precinct [COR-09] in the August 2012 county wide elections when only 9 voting machines were assigned to that election day poll.<sup>27</sup> Exbs. 67 & 68. Emails between the election vendor and local election officials during the days following the election show that the vendor was working on a fix for a precinct export fail after unsetting the election to “correct” the precinct with the 30 machine uploads. Exb. 69. Some 18 days after the election when the database was downloaded at the Shelby County Election Commission no results were contained. Exb. 69. The local official

<sup>25</sup> “The Computer Voting Revolution Is Already Crappy, Buggy, and Obsolete”, 9/29/16; See also “How can we trust the accuracy of recent vote counts?”, Dr. Joseph A. Weinberg, *The Commercial Appeal*, 11/29/15, Exb. 66.

<sup>26</sup> The numbering of voting machine uploads is for machines “0” to “29”. Exb. 67.

<sup>27</sup> Compare Accuvote-TSx Upload Report with Election Day Machine Report.

indicated in an email that the vendor had sent the database to its Canada office to research.

Exb. 69. According to the emails, the vendor was still working to fix it when the vote was certified, and to the best of our knowledge the public was never notified. Exb. 69.

The email chain is as follows:

8/17/12- 3:16pm- from Dennis Boyce (Shelby County Election Commission)- "Due to the Precinct Export failing, we are now working with ESS Tech Support on the Precinct Export Text file. Once this is resolved, we will send it.

..and later "this is not normal. ESS thinks this is due to the fix applied to database to address the ballot issues. ESS is working on it now."

8/20/12- 8:56am- from Dennis Boyce.. "ESS called and completed the repair this morning and will post the database to the FTP site. **They had to unset the election to correct the Precinct ID for COR-09-S.** According to ESS, this was causing the Precinct File to fail."

8/20/12- 9:36am- from Dennis Boyce.."Mr. Brown downloaded the db from ESS and discovered that no results were contained on them. I reported this to ESS. They are now reviewing why and will resend the corrected db. ..."

8/20/12- 1:39pm- from Dennis Boyce.."According to ESS, they sent the DB to their Canada Office to research. Both Cory and Dan made attempts but had to escalate it. Cory [Cory Dukarski- Tech Support- Election Systems & Software]-"Cory mentioned that he send an email to our office only to Albert Homes. [sic Holmes]"

8/20/12- 3:30pm- from Cory Dukarski- "The development team is still looking into this error. Once they have an answer or correction, I will let you know."

8/20/12- 5:04pm- from Cory Dukarski- "**Development is still working on this, sorry for the delay. They should have something by tomorrow.**"

8/20/12- 5:09pm from Steve Griffy (state election office)- "Is Shelby County certifying the results tonight?"

8/20/12- 6:37pm- from George Monger (Shelby County Election Commissioner)i- "**We just concluded our meeting and did vote to certify tonight**"

8/21/12- 9:42am- from Richard Holden (Shelby County Election Administrator)- "**An issue still exists with Dennis getting an answer from ESS & Steve Griffy getting SCEC info. State normally puts all counties in the same format for their Thursday certification meeting. This is normally done prior to Shelby County EC certification.**"



8/21/12- 9:47am- from Richard Holden – “There is no change to prior election practices. The data is to be sent to the state as in all previous elections. They format in standard way for state certification meeting. This has been their practice and continues to be their practice. Normally this happens prior to county certification. We understand this time the issue was awaiting action by ES & S.”

8/21/12- 1:59pm- from Cory Dukarski- **“Dmitri in Development was able to get this file to work, but without rewriting the GEMS code, he does not see another way to get this to work. He is still looking to see what can be done.”** Exb. 69.

The Shelby County Election Commission produced handwritten notes identifying an election worker who uploaded the extra memory cards on election day at the Shelby County Elections Operations east offices. Exb. 70.<sup>28</sup> The handwritten note states “COR-09 machines memory cards were read on 2 separate v. m. (uploaded)” ...”after other cards at ops center\_\_\_ ESS was aware of this + their rep was here”. Exb. 70. The number “19” is circled beside the note. Exb. 70.

The AccuVote-TSx Status Report shows the 30 cards for COR 09 were uploaded over a period of time from 16:50:41 [4:50pm before the polls closed] to 22:15:57 [10:15pm]. Exb. 67. 21 of the uploads for COR 09 were *before* the Election Day polls closed. Exb. 67. Under state election law, the early vote is not to be counted until *after* the polls close on election day.<sup>29</sup>

The Certificate of Results for Election Day for COR 09 shows only 9 voting machines in operation for the day at the poll, with no provisional ballots. Exb. 73. And, the Election Day Accumulation poll tape reviewed for COR 09 shows only 9 voting machines for the precinct and 550 votes. Exb. 74. COR 09 was not an early vote site for the August 2, 2012 election. Exb. 75.

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<sup>29</sup> Tenn. Code Ann. 2-6-304, Exb. 71 & *see* footnote 20. Also, Dennis Boyce with SCEC testified under oath in 2010 about the early vote tabulation process, and expressly states that the early vote memory cards are prepared beginning from 5:45pm, and sit on a cue waiting for upload. Exb. 72, pgs. 73:19-24-80:1-24.



The SCEC produced a document entitled "Special Instructions for COR-9S" which appears to apply to early vote because it states "during the nightly call-in report, include ballot count numbers from the COR-9S machines with your total machine numbers". Exb. 76. It further states that voters will vote on a separate voting machine for COR 09, and will not be found in the programmed list of ballots for the split precinct.<sup>30</sup> Exb. 76.

We are unable to review the early vote poll tapes and Certificates of Results for the August 2, 2012 election in that the Tennessee Elections Office, and Shelby County Clerk have only produced Election Day poll tapes from the archives and state they do not have the early vote poll tapes.<sup>31</sup> The SCEC states that it has neither early vote or election day poll tapes for part of the August 2012 election. Exb. 77. Despite evidence that an inquiry was made by a SCEC official as to how to back-up the TSx ballot images, all records and auditing from GEMS for the August 2, 2012 election [via emails between a SCEC official and ES & S], the SCEC has stated that it does not have the early vote poll tapes, certificates or results; and that the data back-ups are not public records. Exbs. 78 & 79, pg. 3, No. 4. Therefore, as citizens we are unable to review the same.

Under Tenn. Code Ann. 2-8-104 the election commission is required to review all tally tapes from each voting precinct. Exb. 80. However, the Independent Accountants' Report for the

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<sup>30</sup> From the Early Vote Tech sheet (that lists the machines for each early vote poll by serial number), it states that 19 machines were added on July 23, 2012 (but does not specify what machine was added to what early vote poll). The satellite early vote locations opened on July 16, 2012. It is unknown whether these added machines were for COR 09, or due to other reasons. Exb. 75. Even if they were for the COR-9S precinct split, there are still 2 additional memory cards uploaded for that precinct than the total of voting machines at that precinct on election day (9) and the 19 early vote locations- (30 uploads – 9 election day machines – 19 early vote locations = 2).

<sup>31</sup> In 2012, there was a lawsuit filed by Rev. Kenneth Whalum, Jr. against the SCEC. Under Tenn. Code Ann. 10-7403 and CTAS-2057 (County Records Retention Schedule) 9-018 litigation files are permanent records never to be destroyed. Also, under 9-031 the tabulation of election results are permanent records. Under 9-014 the election results are a permanent record. In a letter dated 3/23/17, the attorney for the SCEC further states that it has no documents related to the destruction of the 8/2/12 poll tapes either. Exb. 77.

August 2, 2012 election by Watkins Uiberall PLLC and Banks, Finley, White & Co., CPAs reflects that it only “Compared a sample of precinct vote totals from the election results summary to the votes recorded on the machine tapes generated by the individual voting machines at the precinct.” Exb.81. From the report, it is unknown what poll tapes were in the sample, or how the sample was derived. Also, the SCEC will not produce the GEMS AVServer logs [audit trail], contending that it is not a public record. Exb. 82.

This inadequate post-election audit procedure became even more tenuous sometime after 2012. The engagement of the CPAs was changed from an audit to a work-product contract. According to private conversation by Weinberg with several senior CPAs, this is a major change. Indeed the reports from the accountants had stated that they followed the national audit procedures and standards. Now the CPA report reads.

This engagement is solely to assist the Shelby County Election Commission in ensuring the accuracy of the tabulation of votes and maintaining the integrity of the election process. Our engagement to apply agreed-upon procedures will be conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of the procedures is solely the responsibility of those parties specified in the report. Consequently, we make no representation regarding the sufficiency of the procedures described in the attached schedule either for the purpose for which this report has been requested or for any other purpose. If, for any reason, we are unable to complete the procedures, we will describe any restrictions on the performance of the procedures in our report, or will not issue a report as a result of this engagement.

Because the agreed-upon procedures listed in the attached schedule do not constitute an audit, we will not express an opinion on the accuracy of the tabulation of votes or the integrity of the election process. In addition, we have no obligation to perform any procedures beyond those listed in the attached schedule.

Exb. 83.

The FBI, DOJ Office of Public Integrity, and U.S. Attorney's Office for the W.D. Tennessee were notified of the election irregularities in the August 2012 elections in more detail on August 7, 2014 by letter from Carol Chumney. Exb. 55. It is unknown if they ever investigated.



Open records responses of emails between state officials and the SCEC on September 26, 2012, show that the total results sent by SCEC to the State Election officials did not match the computer print-out submitted. Exb. 84. The Certificate with numbers that did not match was undated. Exb. 85. However, the state officials accepted the report “with a promise that you will look into this issue and that we will not have this issue in the future. Everything should match”. Exb. 84. To the best of our knowledge the public and candidates were never notified, and the emails are weeks after the deadline a candidate was required to meet in order to challenge election results in court.

After the election, Administrator Holden was placed on a three day suspension without pay. Exb. 39. While an audit was conducted by the Tennessee Comptroller’s office at the request of the Tennessee Secretary of State Tre Hargett and Coordinator of Elections Mark Goins, the scope of the “review did not include a thorough review of the voter registration and GIS software used.”<sup>32</sup> Exb. 46, page 7, fn. 6.

#### **B. October 8, 2015 Election**

In the October 8, 2015 election, at least 7 memory cards, some from mostly African American voter precincts and representing hundreds of votes, were not uploaded until between 11 and 22 days after election night according to the Accuvote TSx Status report. Exb. 87.

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<sup>32</sup> The Tennessee Comptroller refused to produce its work file on the audit as not a public record. Exb. 86.



Records reviewed show the following:

<u>Precinct</u>	<u>Machine #</u>	<u># of Votes</u>	<u>Date Uploaded</u>
77-1	#3	109	10/19/15
77-1	#4	108	10/19/15
13-00	#1	175	10/29/15
16-3	#2	87	10/19/15
16-3	#4	83	10/29/15
Mount Zion [Early Vote]	#0	379	10/29/15.
50-2	#3	60	10/30/15

The failure to upload two memory cards was initially discovered by a private citizen computer programmer who took a photo of an accumulation tape at precinct 77-1, and then compared it with an Unofficial Statement of Votes Cast ["SVOC"]. Exb. 88. The Unofficial SVOC showed less votes for that poll than the tapes from the precinct. He brought it to the Election Commission's attention. Exb. 65.

A memo from the Deputy Administrator to the Administrator on 10/19/15 states that he reviewed the "card uploads and logs from election night on GEMS and saw that at some precincts did not show all of the cards uploaded." Exb. 89. The memo states that "77-1 Unity Christian Church 3/5 93 and 4), Mount Zion EV 4/6 (0 and 5). 18 others show 1 card each not being uploaded. Unity and Mount Zion among the four election day precincts. Though I assume these are cards from card readers, all should be uploaded as other precincts were done. I spoke to Darral earlier and asked him to look at them". It is unknown whether the SCEC would have looked for these cards without the initial candidate complaint.<sup>33</sup>Exb. 89.

The Deputy Administrator added in his memo of 10/19/15 to the Administrator that "On

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<sup>33</sup> Interestingly, the GEMS Reference manual, pg. 185-186, states that "the number of memory cards value entered in the No. Mem Cards: Accuvote -OS and Accuvote-TS fields in the Vote Center Editor may be altered even when the election status is set to "Set for Election". ...*Note that decreasing the number of memory cards assigned to the vote center when the election status is 'Set to Election' may cause programmed or uploaded memory cards to be lost*". Exb. 90.

election night I saw the ES &S operating GEMS before I left for 150 [main election office downtown]. Has anyone spoken to him or come up with any other solutions?”. Exb. 89.

A memo from the Operations Manager to the Election Administrator on 10/26/15 states that he was asked by the Deputy Administrator on 10/19/15 to check one precinct for a missing memory card, and three other precincts. Exb. 91. He uploaded them, and reports the TSx printed out “already uploaded to Gems”. Exb. 91. He states “ Unaware that this was for only the cards that were read on election night, I reported that 16-3 was successfully uploaded after checking 16-3 in Gems for completion. It was proven that some of the other cards in question were not read on election night as well. The vendor (which was operating the Gems server) did not mention anything about incomplete uploads”. Exb. 91.

The Accuvote-TSx Status Report we obtained through an open records request shows that some memory cards were not uploaded in the October 2015 election until after the vote was certified on October 23, 2015. Exb. 87.<sup>34</sup> There is an email from one SCEC Commissioner stating that the election certification should proceed even though all of the data about the “problem” might not be available. Exb. 93.

Our first open records request related to the October 2015 election was submitted on October 19, 2015. Exb. 60. Votes from three voting machines were uploaded that day. Exb. 87. The certification occurred on October 23, 2015. Exb. 94. Three more were uploaded on October 29, 2015. Exb. 87. A lawsuit by a candidate for General Sessions Court Criminal Clerk was filed on October 30, 2015.<sup>35</sup> Votes from one more machine was uploaded that day. Exb. 87.

The minutes of the SCEC reflect concerns by at least one Commissioner as to the

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<sup>34</sup> The Certificate of Early and Absentee Balloting was not received by the State until 12/14/15. Exb. 92.

<sup>35</sup> [https://chancerydata.shelbycountyttn.gov/chweb/ck\\_public\\_qry\\_doct.cp\\_dktrpt\\_frames?backto=P&case\\_id=CH-15-1448&begin\\_date=&end\\_date=](https://chancerydata.shelbycountyttn.gov/chweb/ck_public_qry_doct.cp_dktrpt_frames?backto=P&case_id=CH-15-1448&begin_date=&end_date=)

“discrepancies in the election night totals and those presented for certification”. Exb. 94. She further raised the issue of the need for a forensic audit. Exb. 94.

**II. In the August 2, 2012 Election, a SCEC election results database was downloaded with no results found on them, and ESS advised that the database was being sent to Canada for correction.**

Emails between the election vendor and local election officials show that the vendor was working on a fix for a precinct export fail in the August 2, 2012 election after unsetting the election to “correct” the COR 09 precinct with the 30 machine uploads. Exb. 69. Some 18 days after the election when the database was downloaded no results were contained. Exb. 69. A local SCEC official indicated in an email that the vendor had sent the database to its Canada office to research. Exb. 69. According to the emails, the vendor was still working to fix it when the vote was certified and when the precincts results file was sent to the State officials. Exb. 69.

The file delivery receipt email of 8/20/12 of the database download states that:

For non-repudiation purposes, it cannot be confirmed that ES & S Burgan Dan received a file identical to the one you uploaded because the client you used to upload this file (Internet Explorer 9.0) does not support integrity checking. Please use the free ES & S Secure File Transfer with Internet Explorer or a MOVEit file transfer product in future transfers”.

Exb. 95.

As a way of example of how some other counties protect the GEMS database, the King County [Seattle Washington] Elections Security Plan of January 21, 2009 requires that the GEMS is installed only on servers in secured rooms in the elections offices, with none connected to an external network. Any sharing of data files to the Secretary of State, etc, is done by using portable media, such as CD or diskette. It strictly prohibits the use of wireless networking devices on any GEMS server. Exb. 96, pg. 17.



Databases are regularly sent to the ES & S vendor according to Dennis Boyce. In his deposition in 2010 under oath, he testified that the database was sent back and forth with ES & S. Exb. 72, 52:12-17. Boyce states that ES & S needs the GEM's database because "in order to receive the support they asked us to send the database to them to fix". Exb. 72, pg. 52: 18-21.

It is also apparent from documents reviewed that local IT officials are insufficiently trained in the use of the GEMS software, and overly reliant on the ES & S vendor. For example, Boyce testified that SCEC: (i) is not familiar with the CANDV group tables; (ii) he is not familiar with the write-in votes and how they show up in the GEMS's tables; (iii) and he ranked then Administrator Holden as having low knowledge of the GEM's software system (although ranking himself and another worker high). Exb. 72, pg. 93: 6-19.

### **III. The use of a second GEMS database in two elections with complications raises security issues.**

An email obtained through open records requests dated July 30, 2012 refers to a COR 09 GEMS database. COR 09 is a precinct. Exb. 67. The language from the ES & S vendor Dan Burgan states:

Albert [SCEC employee] is moving forward with testing the uploads of cards from the Main Gems DB and the COR09 Gems DB into the DB that you posted to the FTP site. Albert will notify you shortly. [Exb. 97].

The SCEC has only recently produced a sheet that states "Special Instructions for COR9S". Exb. 76. In these instructions it states that those voters will vote on a separate machine and will not be found in the programmed list of ballots for the split precinct. Exb. 76. The AccuVote-TSx Status Report shows 21 more voting cards uploaded from that precinct *before the polls closed* than voting machines assigned and used at that poll. Exbs. 67 & 68. COR 09 was not

Shelby Advocates for Verified Elections ["SAVE"] Report 9/01/17

an early vote poll, but the Special Instructions Memo suggests that voters from a split precinct called “COR 09 S” were handled differently during early vote than other voters and perhaps voted on separate voting machines which could, in part, explain 19 of the 21 extra uploads, but even then there are still 2 unexplained memory card uploads. And, the use of a second database in such a manner, is problematic as further explained below. Moreover, allegations were made in 2010 related to unexplained early uploads of votes at *the same precinct*, COR 09, which raises questions due to the pattern.

In 2010, a lawsuit was filed by several candidates where 5,390 voters were affected when the May 2010 early vote database [instead of the August 2010 one] was uploaded prior to election day.<sup>36</sup> Exbs. 98 & 99. One election worker told the Tennessee Bureau of Investigation that another worker told him that the problem was discovered in pre-election day testing, but apparently not corrected before election day. Exbs. 100, pg. 7. Staff member Dennis Boyce testified that “the problem was that the script used to process the data had the wrong election ID in it.” Exb. 72, pg. 12:9-10. Boyce added that “ES & S wrote the script” which was used in the May, December and January elections without any revisions. Exb. 72, pgs. 21: 17-24; 22: 1-7. In August, when notified, ES & S looked at the data remotely, and “ran some scripts against” the EPB database to fix the problem according to Boyce. Exb. 72, pgs. 16: 1-15; 17:2-19. Boyce doesn’t know if using the script elections impacted on the accuracy of the data for the December and January elections. Exb. 72, pg. 22:8-14.

Questions were also raised about precinct COR 09 in the lawsuit, when the plaintiff candidates claimed that the number of votes from the Participating Voter List (“PVL”) differed from the Statement of Votes Cast for that precinct, and further that audit logs show it to be one of

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<sup>36</sup> *Newman, et al v. Shelby County Election Commission*, 2012 Tenn. App. 94.

five locations where thousands of “phantom votes” were uploaded on the day *prior* to the election.<sup>37</sup> Exb. 101 & 102. Dennis Boyce testified that he had no knowledge of why any voters would be missing from the PVL in certain precincts. Exb. 72; pgs. 14-24; 73: 1-7. While the lawsuit was thrown out when the plaintiffs could not get all of their proof admitted into evidence, the fact that the same precinct is involved in two different elections with regard to unexplained early upload of extra votes merits an investigation as to what happened in each election and why candidates and voters were not apprised of the same before, during or after the elections.<sup>38</sup>

Likewise, in the October 2015 election, a second database was used. The Deputy Administrator of Elections reports on 10/8/15 that the backup GEMS server was used “as there were problems of unknown nature with GEMS GBF file. Exb. 103. He explains the “Delay of posting election night results was due to the fact that results from GEMS server not being received. Last results received approximately 02:00AM. Exb. 103. The SCEC Operations Manager reported on 1/7/16 that there was a “communication break down between the Gems database and Memory cards. Exb. 104. He says that “the database wasn’t recognizing the cards as downloads”. Exb. 104.

It was reported that the ESS vendor “sent an election database completed by its team to Memphis on Sept. 22 and gave the files to the election commission.” Exb. 105. The news story in the *Memphis Daily News*, 10/27/15, reported that the database had to be updated, “so ES&S did

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<sup>37</sup> The witness posted a report online contending that she identified from documents and computer audit logs uploads of votes on the day *prior* to the election from five locations, with 3,221 more votes counted in the final certified results than names present on the Participating Voter List. One of the early uploads, according to the witness, was from COR 09. See <https://www.opednews.com/articles/4/SHELBY-TN-3-221-PHANTOM-by-Bev-Harris-100916-287.html>

<sup>38</sup> The researchers for this Report did not find out that irregularities at COR 09 were at issue in the 2010 lawsuit, until after discovering the unexplained 20 uploads from COR 09 for the August 2012 elections.



the update and provided a new database.” “But with the change, the commission had two databases to manage on election night; some of the memory cards to be used had already been programmed from the first database.” Exb. 105.

As reported by the *Associated Press*, “Georgia’s elections tech director, Merle King, called using dual databases a “doomsday scenario” because it bypasses many security safeguards. The risk of error increases because some votes need to be manually entered.”<sup>39</sup> Exb. 106.

**IV. On at least on two occasions Shelby County (Memphis) voting machines were connected to the Shelby County Government IT which according to experts can allow for hacking.**

The 2013 Shelby County Election Process Final Report from the ES& S vendor, found that the server “is plugged into the internet which exposes the server to the potential for external penetration, even if the server is only on the network for a few hours.” Exb. 63. The report adds that with the current configuration “when the GEMS server is plugged into the county network, the server is vulnerable to hacking, virus, and malware. The report further found that the tabulation server room could be accessed by many people “which makes it difficult to defend against allegations of tampering”. Exb. 63. SCEC Commissioner Norma Lester voiced concern about the “Vendor having unfettered access to Security Code and Server” at the SCEC July 31, 2013 meeting. Exb. 107, pg. 3.<sup>40</sup>

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<sup>39</sup> *Associated Press*, “Election susceptible to rigging despite red flags”, 12/26/16. The group’s research and documentation was relied upon by the A.P. reporter in part for the story.

<sup>40</sup> See also University of California report on Diebold Election Systems Incorporated voting system (Diebold GEMS 1.18.24/AccuVote), Exb. 108, pg 10.

The October 27, 2005 Diebold RFP response<sup>41</sup> for the system states with regard to security protocol for the GEMS Server that it be stored in locked rooms, in a closed environment, a closed election system with no access to external systems (e.g. intranet, Internet). Exb.109.

A 2007 report of the Tennessee Advisory Commission on Intergovernmental Relations entitled “Trust but Verify: Increasing Voter confidence in Election Results” [Exb. 64], raised concerns about the Shelby County Diebold Gems Central Tabulator from the August 2006 primary election. It noted a critical security breach where not only the Diebold central tabulator was plugged into a county government network switch, but also had unauthorized software installed which would allow “unfettered remote access to the central tabulator to anyone connected to the county government network or the Internet”. Exb. 64. The Report expressly states in Appendix “A” devoted exclusively to Shelby County Election Commission that “the GEMS central tabulator should absolutely NOT be connected to any network via Ethernet card, wireless network card, infrared port, USB port or modem.” Exb. 64. Obviously, as evident from the subsequent 2013 report, this directive was not followed.

#### **V. Documents Show Passwords and Access Have Not Been Properly Handled**

The user login, password and instructions to login for an updated voter file was *emailed* to State Officials on July 27, 2012 by the SCEC. Exb. 110.

Also, a Shelby County Government Internal Audit in 2013 found that “temporary and permanent staff were identified as having administrative rights to ESM similar to the system rights granted to the EC Administrator. Administrative rights give full permission to user accounts to make adjustments to the application. Lack of control over system permission could

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<sup>41</sup> The RFP is contained in the contract for the system purchased by the Shelby County Government. The entire RFP and contract available for review upon request.

result in unauthorized adjustments to the security administration, such as the ability to change passwords of others thus giving one the ability to log in as another person; capabilities to rename, delete and recreate user accounts to disguise any transactions; and changes to system settings and coding for different applications/modules”. Exb. 3, pg. 22.

The county internal audit further found that “29 temporary employee user profiles” were “not disabled upon their termination of employment.”<sup>42</sup> Exb. 3, pg. 22. It reports they were subsequently disabled after the review. A computer user profile used to make changes was even deleted during the audit.<sup>43</sup>

As set out in the Diebold RFP response, administrative security for the GEMS system includes the authorization of users and passwords for the GEMS application, election database and server, the management of password log sheets, and other information to record and track user access to the GEMS server and the Microsoft operating system” Exb. 6, pg. 72.<sup>44</sup>

**VI. A TACIR report found unauthorized software installed on the Shelby County system which would allow editing of election results.**

A 2007 report of the Tennessee Advisory Commission on Intergovernmental Relations entitled “Trust by Verify: Increasing Voter Confidence in Election Results” reported unauthorized software installed on the Shelby County voting system which would allow “manual

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<sup>42</sup> Dennis Boyce testified that ES & S has remote access to the GEM’s tabulating system based upon permission. Exb. 72, 84:13-21.

<sup>43</sup> *The Commercial Appeal*, Editorial, “Election Commission Administrator displayed a disturbing lack of urgency in addressing audit findings”, 9/6/13; “Critical Audit Targets Shelby County Election Commission, again”, 9/4/13.

<sup>44</sup> See also Univ. of California report which discusses how a Windows Administrator access can be used to manipulate the GEMS database and alter voting results. Exb. 108, pg. 11 b. The report also discusses (pg. 14)-how GEMS Server log in credentials could be extracted from the insertion of a PCMCIA card into the TSx which has been programmed to dial into GEMS at the close of the polls. Also, how the TSx can be programmed to remotely call hackers from its modem and allow login remote access to the GEMS PC. (pg 13).



editing of the Diebold GEMS database file: with the “AuditLog” table able to be “easily” edited, and that “Vote totals can be altered in the “CandidateCounter” table. Exb.64. It further found that the HTML editor software installed indicated that “someone was attempting to edit saved Diebold election summary reports, perhaps to agree with altered vote totals in the Diebold Microsoft Access database file”. Exb. 64.

The report concluded that the “real threat for wholesale election fraud lies with the Diebold central tabulator”. Exb. 64. It added that “unless Shelby County election officials can be seen as conducting a good faith investigation as to who had access to this central tabulator PC and the above unauthorized software and who actually did the illegal install, voters in this county (and ultimately the state) can have no confidence in the integrity of the November 2006 election.” Exb. 64. It is unknown if the investigation was conducted, or whether any persons were held accountable.

**VII. There are improper controls to ensure that an unauthorized memory card is not utilized during the election process and to secure voting machines.**

When the group began the open records requests, one concern was the chain of custody for the memory cards from the precincts to the Zone Turn-in Site. In response to open records requests for logs of the memory cards turned in at each site, an attorney for the SCEC responded via email of 1/21/14 that “they do not exist. There are no logs because the procedure is, as the cartridges are delivered, the precinct or zone is checked off on a list and the list is not kept”. Exb. 111. It is believed that subsequently log procedures have been implemented, but there is question as to their sufficiency in identifying the number of memory cards turned in for each precinct at the Zone Turn-in Site.

One Election Commissioner in an email to Dr. Weinberg in November 2012, writes that “I think manipulation occurs inside the Commission either at turn in zones during the course of reconciliation and possibly during tabulation.” Exb. 112. She elaborates, “It is a mess and I don’t fully understand [about reconciliation]. It occurs every night during early vote and was the major reason totals weren’t posted on the web every day. They couldn’t get the totals to balance. I worry about what they do to make them balance.” Exb. 112. The Commissioner adds, “There has been rumors that ballots have been backed out but I have not been able to prove”. Exb. 112.

One July 30, 2012 ES& S email reports that a SCEC early voting unit was shipped to Omaha for delivery with 123 votes on the unit before it went down. Exb. 113. The email adds “They need our help in recovering these votes. I need to confirm that we have received the unit, what the status is, and how quickly we can get it back to Shelby County. Also, every action taken on that unit needs to be well-documented”. <sup>45</sup>Exb. 113.

On November 8, 2016, Dr. Joseph Weinberg and Carol Chumney, Esq., served as poll watchers to observe the early vote count at the Shelby County Election Commission. According to officials asked that day, five of the election day zone returns are sent in on a VPN line.

We observed that the early vote machines were removed from carts and unlocked in the afternoon. There appeared to be multiple opportunities for someone to slip in a card unnoticed because at the beginning only one worker plugged in the early vote machines in each row, cut the seals, opened the machines, turned them on and printed a tape. This was all done before the election day polls closed. Two people would then go down the row and sign the tapes and write down the counter numbers.

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<sup>45</sup> To the best of our knowledge, no candidates, or citizens were made aware of this development.

One election official personally removed the cards from the early vote machines and handed them to another election worker and they put them in plastic bags on a table. Then after 7pm, they took the plastic bags to about 15 different machines which were used to upload the cards by multiple election workers.

Although state law prohibits cell phones of poll watchers, multiple election workers had cell phones, as well as the Election Commissioners. Also, multiple workers who were uploading the early vote memory cards walked in and out a door to the public outer office area by the machines that were being used for upload of the memory cards. Even the auditor walked away at one point. It would have been easy for a worker to take a card outside of the enclosure, bring one in unnoticed, or even have one in his pocket when he first arrived. At least one study has reported that malware can be placed on a card and if inserted into a TSx machine could spread to infect the GEMS server.<sup>46</sup>

### **VIII. There are calibration problems which may impact voting total results.**

The Diebold RFP response states that the machines are calibrated upon manufacture and “no further calibration is required”. Exb. 6, RFP, pg. 56. However, the Premier Elections Solutions AccuVote-TSx Hardware Guide (2009) states that styluses for calibration are required for maintenance. Exb. 114. It adds that “if not calibrated correctly the system may not operate correctly”. Exb. 114, 5.1. Dr. Weinberg documented the problem to the SCEC in October 2015 (as well as again misassignment of voters). Exb. 115. Even former Tennessee Attorney General Mike Cody reporting that he had difficulty when trying to vote for Congressional candidate

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<sup>46</sup> Univ. of California report, Exb. 108, pg. 12-13, 16; see also, “Electronic Voting System is Vulnerable to Tampering”, Headline@Hopkins Media Advisory, 8/1/03; see also [www.verifiedvoting.org/resources/voting-equipment/premier-diebold/accuvote-tsx/](http://www.verifiedvoting.org/resources/voting-equipment/premier-diebold/accuvote-tsx/) (contends that TSx is susceptible to viruses transmitted through its memory card bank, and cautions to report broken seals because a person can install his own software on a TSx once gaining access to the machine).



Steve Cohen in 2016, when it “defaulted or bounced up to the first person on the ballot”. Exb. 116. And, Shelby County Election Commissioner Norma Lester wrote that “there remains numerous occasions when selecting Hillary the vote flips to Trump and when selecting Trump his is totally removed from the ballot. This is because he is first and there is no where else for him to go. “ Exb. 117. She adds, “[t]hese machines have exceeded the life span of acceptably. Two years is the absolute longest we should have to wait. As taxpayers we deserve better and nothing is more important than the integrity of the election process!”. Exb. 117.

**IX. Candidates are not permitted to have their own experts inspect the system prior to use in the election, and there are no independent audits of the equipment.**

As far back as 2003, former State Representatives Mike Kernell and Carol Chumney were seeking to inspect the voting machine software as part of the candidate election preparation process, and were denied. Presumably, Tennessee is not the only state that only allows candidates to review the outside of the voting machines, and does not authorize a review of the software or tabulator. The law dates back to pre-IT times and provides scant assurances to candidates of the integrity of the voting system and final count.

Besides authorizing candidate review by experts, there should be independent and random audits of the software and tabulator by state and/or federal authorities. Even when there have been election irregularities and request for the same, state and federal officials have not disclosed whether any internal review of the voting systems and tabulators has been conducted. Exbs. 3 & 46. While the Shelby County Election Commission may conduct its own pre-election audits, these are not made public and open records requests for machine audit logs are denied.<sup>47</sup>

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<sup>47</sup> Also, all patches to correct identified security flaws should be independently confirmed, such as the flaw in the tabulation software that “failed to record significant events occurring on a computer running the software, including Shelby Advocates for Verified Elections [“SAVE”] Report 9/01/17

Pre-election testing has not met national standards. Entire splits of voters have been left off the election database and this has been missed by its pre-election testing.

**X. Some election data, and poll tapes have been destroyed or discarded.**

The Shelby County Election Commission advises that it has no copies of the August 2010 early vote poll tapes. Exb. 60. A review of documents produced pursuant to an open records request to the Tennessee Secretary of State provided only election day poll tapes, and certified tabulator print-outs for the 2010 early vote precincts. Exb. 119. There were no early vote poll tapes produced by either entity for that election. Thus, it is difficult to verify the integrity of the election.

The Shelby County Election Commission further advises that it does not have the August 2, 2012 early vote poll tapes. Exb. 77. The open records requests to the Tennessee Secretary of State, and the Shelby County Court Clerk, resulted in the production of Election Day poll tapes and certificates for August 2012, but again no early vote poll tapes or early vote certificates of results.

One suspects based upon 2010 certificates of early vote tabulator print-outs that it might have been a practice not to run the early vote poll tapes and rely solely on the tabulator print-out. Exb. 119. If this is the case, than the manipulation of results can be easily accomplished with the editing software previously found on the system.<sup>48</sup> Because only a sampling of poll tapes was reviewed by the accountant auditors for those elections, the altered results could easily go undetected.

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someone deleting the votes before or after the election”, *“Diebold Quietly Patches Security Flaw in Vote Counting Software”*, 8/12/09, Exb.118.

<sup>48</sup> <https://www.bloomberg.com/news/articles/2016-11-04/how-to-protect-against-election-day-hacking>

Despite any wiping of the system and voting machines by the SCEC for subsequent elections, there is a possibility that the data still has been internally archived on the GEMS hard drive and can be reviewed. Also, the TSx is likened by the vendor to a general purpose PC, and has internal flash memory. Exb. 6. The SCEC explains the GEMS tabulator it as “a desktop computer running proprietary software for tabulating election results. The data from each of the voting machines was read from the PCMCIA cards from each voting machine, transmitted to the computer and then tabulated.” Exb. 120, No. 15. The data and audit logs should be made public in order to answer the questions about the elections.

Moreover, required procedures should include backing up the data, and printing out, copying and scanning of all poll tapes (which can disintegrate over time). The originals should be permanent records.

**XI. The SCEC did not perform a complete audit of all poll tapes with voter sign-in sheets, voter ballot applications, and printed tabulator results for several elections.**

In a May 2014 County Commission election, one candidate was declared the winner with only a 26 vote margin. The other candidate, Martavius Jones, had tallies from reports posted at certain precinct polls that the race was instead a tie. Exb. 54. He notified the SCEC some 10 days after the election. The Shelby County Democratic Primary Board heard the matter, and testimony was given by an election official. Exb. 54. The official admitted that at least two poll tapes were not run on election night, but claimed the correct results were posted on the SVOC due to the memory card upload of those votes. Exb. 54, Transcript pgs. 18:12-24; 19:1-23. During his testimony under oath, the election official admitted that only a sampling of the poll tapes were audited post-election and compared to results. Exb. 54, Transcript pg. 16:8-23.



Tennessee state law requires post-election audits, where each poll [tally] tape is compared to the tabulated election results.<sup>49</sup> Yet, Independent Accountants' Reports reviewed for August 2012, November 6, 2012, May 2014, and October 8, 2015<sup>50</sup> all reflect only a sample of poll tapes reviewed for the reports. Exbs. 81, 122. It is unknown how the sampling was derived, or even what poll tapes were sampled for the reports.

A July 22, 2015 letter between Richard Holden, the Election Administrator and the Watkins Uiberall accountants specifies that the it makes "no representation regarding the sufficiency of the procedures..", and they do not constitute an audit. Exb. 83. The letter further states that "we will not express an opinion on the accuracy of the tabulation of votes or the integrity of the election process." Exb. 83.

As we can see from the October 2015 election, the failure to timely audit all poll tapes can result in misreporting results. In addition, an October 8, 2015 SCEC Help Desk Log shows numerous calibration issues, a seal cut on one machine [59-05], "machine will not print zero report", "machine messing up votes. Voter votes for candidate the name of the candidate above or below it shows selected. However the summary screens shows the correct info", "machine '0' operating erratically", "1 machine says 'Pre-election'", "voting totals machine #2 50329 (showing 5329)". Exb. 121. None of these issues were reflected in the Independent Accountants' Report<sup>51</sup>. Exb. 122.

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<sup>49</sup> Tenn. Code Ann. 2-8-104. Exb. 80.

<sup>50</sup> After a candidate filed a lawsuit, it is believed that a complete review of poll tapes was later conducted for the October 2015 election.

<sup>51</sup> Also, two voting machine seals were removed by the ES & S vendor on 10/29/15 for a precinct "to reprint the accumulation tape and check the card count from TSx". Exb. 123. It is not known whether candidates were advised of this action or allowed to observe. The precinct involved was one that had a late memory card upload on 10/30/15, which was at issue in an election contest.

In the August 2012 election, there also were reports by poll officials of broken, missing, and tampered with seals, as well as seals not matching machines.<sup>52</sup> There were some instances of machines indicating a voter had already voted when he had not, name of different candidate than the voter selected popping up, ballot apps and machine totals not matching certificates of results, unsealed electronic poll books, accumulating machine “gooblelook”, etc. Exb. 124. These were not reflected in the Independent Accountants’ Report, nor the highly unusual activity of having 132 election commission poll workers pick up microchips for electronic poll books the night before the election.<sup>53</sup> Exb. 81. Obviously, with the number of poll workers involved, the process did not provide adequate security with regard to the microchips distributed that night before the election.<sup>54</sup>

Federal and state law should require an audit of poll tapes, with voter sign-in sheets, voter ballot applications and printed tabulator results to ensure accurate tallies, and consequences for failure to do so. All unusual activity should be thoroughly investigated, addressed, reported to any appropriate authorities and made public.

## **XII. Requests to federal and state officials for adequate investigations are routinely ignored.**

The irregularities in the Shelby County voting systems and processes have repeatedly been reported to federal and state officials for investigation, but the problems continued. Despite

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<sup>52</sup> Broken voting machine seals in the August 2010 elections were also reported in *Newman, et al v. Shelby County Election Commission*, 2012 Tenn. App. 94, \*20.

<sup>53</sup> At least one expert opines that by breaking into the electronic poll book system and changing data, with a few clicks a hacker can wreak havoc on election day by changing addresses, etc. “It is now clear US voting is hackable. Here are 6 things we must do to prevent chaos”, *Vox*, 6/16/17.

<sup>54</sup> According to a security expert at the recent hacker conference, a Shelby County Election Commission ES & S electronic poll book bought on Ebay contained over 650,000 voters’ personal records. If given memory card access to the electronic poll book before the election, he says he could write a script in seconds to mark voters as already voted absentee. Exb. 125. This is not the first time that security questions have been raised about the discard of election equipment. In 2010, the SCEC Election Chairman admitted that computers had been taken outside of the premises by a worker for an adopt a computer program, even though an election contest was pending. Exb. 101.

these many reports, we do not believe that the state or federal officials have conducted any investigation of the Shelby County election commission software, voting machines and tabulator since first requested in August 2012. Today we still do not know the answer to basic questions, such as what happened to the August 2012 early vote tapes and certificates; were proper security measures in place; why the need for two databases in that and the October 2015 election; why 21 cards were uploaded before the polls closed on August 2012 election day; or why the late uploaded memory cards were not discovered and uploaded earlier in the October 2015 election. A full independent inspection of the software, audit logs, tabulator, voting machines, should be conducted and a report made public.

### **CONCLUSION**

The lack of independent election voting machines, software, and tabulator inspection, complete audits, maintaining poll tapes and other election data, election process monitoring, and verifiable paper trail make the elections insecure.

The Shelby County voting machines, software, and tabulator, need inspection by qualified experts in light of the foregoing. The continued “glitches” over databases utilized, voter district misassignments, extra memory cards uploaded before the polls close, failure to timely upload all memory cards, over a period of five years or more without review of audit logs by a competent independent expert or appropriate investigatory authority is inexcusable. The public deserves better.

Stronger safeguards should be put in place to ensure complete audits, require regular independent inspection of election voting machine, software and tabulators, and to copy, scan and maintain poll tapes, certificates, and other election data. Stronger safeguards are needed to



monitor the election process, and ensure the integrity of the voting machines and memory cards.<sup>55</sup>

In Tennessee, the problems with the DRE were discussed at the State level as far back as 2007 by the TACIR.<sup>56</sup> Exb. 64. Despite that and the fact that even the former CIA Director John Woosley has stated that the use of non-paper trail machines is a threat to our national security, the current Shelby County Election Administrator states that she wants to wait until the 2022 elections for use of a new voting system with a verifiable paper trail. Exb. 128. As voting is a fundamental right in this country, this is too long and compromises the very underpinnings of our democratic form of government.<sup>57</sup> Somehow, the logistics of elections must be uncoupled from partisan politics.

We are concerned that the problems uncovered in Shelby County are not unique. Our report shows how our fragile election system can be subverted at multiple points. Our system can be attacked in many ways beyond electronic hacking. A verifiable paper trail is needed to be put in place and fully operational by 2018 fall elections for all counties using outdated non-paper trail machines. Unless citizens and experts around the nation are listened to and their recommendations taken seriously, this refusal to take notice and a reliance instead on wishful thinking, will result in our continuing to vote on *thin ice*<sup>58</sup>.

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<sup>55</sup> See NASED, "Voting Memory Card Issues", 3/22/06, which mentions that corruption of the memory card with the intent to change vote totals can occur after the device is set for election and before the first vote is cast. To prevent corruption, it requires that a chain of custody for all memory cards, sealed during nonelection use, and tamper resistant seals once inserted into the device. Exb. 126.

<sup>56</sup> See also, TACIR Update on study of elections issues-9/27/13, Exb. 127; and *New York Times*, "Sowing Doubt is Seen as Prime Danger in Hacking Voting System", 9/14/16.

<sup>57</sup> For a technical discussion by many computer experts of many of the same security issues raised in this report, see "How to Hack an Election in 7 Minutes", *Politico Magazine*, 8/5/16.

<sup>58</sup> Amplifications, revisions, and/or corrections to the SAVE Report will be posted at the [www.votingonthinice.com](http://www.votingonthinice.com) website.

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### **NOTE**

“We shape our tools and then our tools shape us.”

—*Marshall McLuhan*<sup>59</sup>

The impetus for this study was the discovery by David Holt, a citizen, who was told to vote in the wrong district in early vote of July 2012. Although much had been viewed as problematic before the events of July-August 2012 in Shelby County, those events were incredible especially as Dr. Weinberg researched and discovered a very real failure of the system.

This report is meant to analyze systematic failures of the election machinery. It is in no way meant to give blame to any one person. However, we believe further investigation is merited and long overdue. We have known many hard-working citizens and staff in the election process and appreciate their efforts. We just want the truth and subsequent reform for the public good.

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<sup>59</sup> See <http://quoteinvestigator.com/2016/06/26/shape/> for others this quote has been attributed to including Winston Churchill.