



THE LEAGUE OF WOMEN VOTERS OF SOUTH CAROLINA

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QUESTIONS & ANSWERS: AUDIT OF NOVEMBER 2010 RICHLAND COUNTY VOTE

Overall questions

Our understanding of the protocol is that at the end of the day the master PEB in each precinct collects the vote totals from each iVotronic, and that is what goes into the totals for that precinct. In addition to that, the memory cards from each iVotronic are pulled from the machines and put into a plastic bag. The county then uploads the individual vote data from those cards into the “vote image file”.

This gives us two independent vote totals, one from the PEBs and one from the memory cards. Those counts should agree, but what we have found is that they don't, or at least they didn't. What we are proposing is simply that software like what we have written be used before counts are certified to make sure that the counts are accurate. The elections commissions have both sets of data, and it's an easy matter to use that data to help ensure an accurate count.

There is also an “event log” produced by each of the iVotronic machines, recording the casting of individual votes, the opening and closing of the machines, and so forth. This provides a third count of the number of votes cast on a given iVotronic machine, and this count should agree with the other two. Finally, there is a file, called an EL68 file, that logs the collection of votes from the PEBs.

Ward 21

Our understanding of the protocol is that the master PEB (with a green stripe) is used for opening and closing the iVotronics and for collecting the totals, and the red stripe PEBs are used to open the machines during the day to accept one vote at a time. It is clear that two PEBs were used in Ward 21 to open and close machines (three iVotronics for each PEB) and that only one PEB (probably the green stripe) had its totals collected.

However, apparently the memory cards were pulled from all six machines, and the individual votes went into the vote image file, which is why we could detect that 355 votes had not been included in the certified count.

This shows exactly why the audit we are suggesting would be useful. If there is a mistake made with one count but not the other, then the audit would detect that and allow the counts to be corrected before they were certified.

Bluff

The paper tapes at the end of the day show that votes were not collected from six of the eight machines. There should have been questions raised at that time, because the poll book should have had more than

1000 signatures and yet only 200 some votes were listed in the end-of-day paper tape. But these problems were not detected for some reason. It appears from the event logs that the six machines whose votes didn't get into the certified count were not closed on election night. They were apparently not closed and didn't have their votes collected by the PEB until a week later, on November 9.

However, obviously the memory cards were pulled from the machines at some time, or else the individual votes wouldn't have been included in the vote image file.

This shows a different error that would have been caught by our proposed audit. There are three independent sets of devices that are in action during an election—the iVotronic machines, the PEBs, and the memory cards. The votes cast on a given iVotronic show up in the memory cards and the vote image file. The PEBs that open and close iVotronics show up in the event logs and the EL68 file. Our current software detects that devices that have been used haven't been properly checked back in to the county. We propose improving that to make sure that all machines and devices that have gone out before the election are accounted for the day after the election and have had their data collected.

The other missing data

What seems clear is that not all the machines in all precincts had their memory cards pulled, so not all the data was included in the vote image file. This would account for missing data in seven precincts and for totally missing the data for Gadsden and Riverside. The counts were collected by the PEBs and got into the certified total, but the supporting data from the memory cards didn't get added in until we pointed out to the Richland officials that the data wasn't there. When we gave them that information, they went out to the warehouse and found memory cards still in machines.

Again, this shows the need for verifying that all the independent actions have been done and all the data has been collected. Our program didn't collect that data, but it showed that data hadn't been collected from some machines.

Why isn't this done already?

We don't want to try to answer the “why” question, and would suggest that this be directed to the vendor or the State Election Commission. The computer scientists on our team certainly feel that this ought to have been included from the beginning.

An election is a complicated matter, distributed across multiple locations, with volunteer workers who don't do it every day. Further, putting an election together and collecting the data at the end uses multiple software packages from the vendor.

The computer scientists feel that crosschecking with software should have been an obvious thing to include in the election system simply because we know that there will be human error in a situation like an election. Buell's program was written in one afternoon and runs in less than a minute on a laptop for all the data in Richland county.

We think something like this should have been part of “the system” from the beginning, and we are offering what we have to Richland and other counties in the state so that these kinds of errors can be caught before certifying the totals and so citizens can be more certain that their votes are being included in the counts.

Fraud

We don't have any reason to suggest or suspect fraud. All the problems we have found could easily have been just the human errors of volunteer workers at the end of a long day.

What this also shows, though, is that the software of our election system is guilty of being flawed if the obvious kinds of human errors that could have been detected by the software were in fact not detected by the software because the code to detect the errors wasn't in the system.

A slot machine in a casino, for example, almost certainly has two independent "totals"--the cash drawer and some internal record of revenue in and payouts out. We doubt that a casino would accept the money in the cash drawer collected by a worker on the floor without checking the amount against revenue less payout. All we have done is a similar sort of check with the vote data.

Results

We have not checked everything in minute detail, but we have looked over the results and we have not seen anything to suggest that the outcomes of any contest would have changed by including the 1127 votes that didn't get included. We are told that the Richland County officials have in fact checked that no outcomes would have changed.

Why Richland?

We are collecting data from a number of counties, so far including Richland, Charleston, Florence, Sumter, Colleton, Lancaster, Lexington, and Greenville. Richland was chosen for this in part because it is large and because Buell lives in Columbia (in Woodlands, precinct 378) so this is both close to home and easy for personal contact with the election commission in a large county. Our analysis is showing some similar anomalies in other counties, and we will be releasing results on those at a later date when we have had a chance to examine the other counties in detail. We have focused on Richland first because it happens to have examples of errors that could have been detected but weren't.

Other counties?

We have spent most of our time so far on Richland County and Colleton County. Richland was chosen for the reasons above and then focused on because the problems we found seemed to be good examples of what could go wrong and how easy it would be to detect these problems in the future. Colleton was chosen because the certified vote count is pretty much agreed by all to have been incorrect. We are trying to determine from the data what actually did happen and why the counts came out the way they did.

We will continue to look at the data from other counties as time permits.

Are you trying to sell this to the state? Or what?

Buell and Moore have maintained this what they have done can hardly be called rocket science, so it would be wrong to say that it ought to cost the state a lot of money. Both sets of programs are or will be freely available for the state or county people to use.

On the other hand, these programs were written and used by expert programmers and have not

necessarily been written to be used by election workers. Installing the code and demonstrating its use to a single county would be relatively easy; expanding to all 46 counties would involve a significant investment in time. What we propose, therefore, is that Buell and Moore provide—at no cost--a couple of strategy and training sessions that would permit one or more appropriate state employee(s) from the SCSEC, or the CIO's office, or similar state agency, to expand the use of this code or follow-on versions of it. Again, we specifically claim that this is a routine computational task and that once Buell and Moore explain what they have done it will be easy to continue to an audit package that is usable statewide. The code as we have it we will give away. The time invested to ensure its use in all counties must come from the counties and the state, but we don't think this is more than a couple of weeks' work for a single person to explain to all the counties.