

White Paper

FSASE Consideration of Audit Legislation in 2008 To amend FS 101.591, as amended in 2007 by HB 537 Prepared by the Joint Audit Working Group¹ November 2007

Purpose of This White Paper

This White Paper is prepared to assist members of the Florida State Association of Supervisors of Elections (FSASE) consider whether to support legislative action in 2008 to amend Florida's post-election audit procedures.

Scope and Definition

Sections 8 and 9 of HB 537, amended FS 101.591, "Voting System Audits," effective July 2008. The term "audit," as applied to elections, can mean many things and is often confusing. This is a consideration of specific audits of only a narrow portion of the overall voting system so we're not going to use the term "voting system audit" because it is too broad.

We prefer the term "post-election audit" and define it generally as²:

After the polls have closed, manually counting a sample of the voter-verifiable paper ballots or records and comparing those tallies to the machine tallies in order to raise confidence that election results:

- Have decided races correctly
- Have not concealed errors
- Deserve public confidence
- Instruct future improvements

¹ The Joint Audit Working Group (JAWG) includes members of FSASE, Florida Voters Coalition, and an Advisory Panel made up of election officials and technical experts experienced in election audits. Most JAWG members attended the [2007 Post-election Audit Summit](#) last month in Minneapolis. Also see *Acknowledgements* at the end of this White Paper

² The Post-Election Audit Summit used a more precise definition to describe the same thing: Also see *Note on Certification Deadlines* at the end of this document

The audit of election results, conducted after the polls have closed and before certification, by performing manual counts of paper ballots and voter-verifiable paper records in randomly selected units (e.g. precincts) and comparing them to the corresponding electronic or manual tallies, for the purpose of verifying the election result with a high level of confidence.

Background

Florida's 2007 legislature passed the Governor's "paper trail" bill, HB 537, providing marksense ballots for most Florida voters, along with many other changes to the election code. Those counties not already using optical scan voting systems are now well along to converting their all-DRE systems to optical scan. Most counties will continue to use DRE machines for ADA compliance until 2012.

Both optical scan and DRE systems use electronic tallies of votes. Whether or not one believes these systems produce reliable election results when administered correctly, there clearly exists growing public concern that electronic tallies by themselves may not be reliable. While criticism of DREs has made the most news, criticism of optical scan tallies is also suffering growing distrust due to reports of software and other security vulnerabilities, including testing and technical bulletins³ from Florida's Secretary of State earlier this year. Meanwhile, no less than the National Institute of Standards and Technology and the EAC's Technical Guidelines Development Committee have pointed out that it is beyond the state of the art to produce error-free and completely secure software; and the draft version of the 2007 Voluntary Voting System Guidelines requires all voting systems to be software-independent.

It is in the interest of everyone to increase public confidence. On election night – and especially in what is sure to be a highly scrutinized Presidential election in 2008 – the public's confidence to accept election results, as announced by county and state officials, will determine whether the aftermath for election officials is a nightmare of controversy, media scrutiny, endless review, public records requests, litigation, spiraling costs and distraction from subsequent elections – or a more routine business of closing down sites, filing records to sit quietly in storage, and getting some rest.

Yes, the public deserves good elections. So do Florida's election officials. Public confidence in the results will be the measure of whether elections have been good,

³ See 27 July 2007 SAIT Diebold Report and 10 August 2007 Supplement. Also see 3 March 2006 and 23 August 2007 Technical Advisories from FL Div of Elections as examples.

regardless of anyone's *opinion* of whether they were good or not. Public confidence is the largest contributor to whether life will be businesslike or a nightmare for election officials. It's not necessarily logical. It's just true.

What's So Great About Post-election Audits?

Post-election audits are the new hot topic and for good reason. Last month's Post-election Audit Summit in Minneapolis had only about 100 attendees. But it attracted eight or nine Secretaries of State offices, dozens of election officials, many of the most respected computer scientists, statisticians and auditors in the country, and dedicated public advocates from many states including Florida. The Vice Chair of the federal Elections Assistance Commission, Rosemary Rodriguez, and representatives from the EAC's Technical Guidelines Development Committee and the GAO also attended.

Here's something remarkable: Everyone got along well! In fact much comment was made during and after that not only had the summit been extremely informative – even advancing the science of post-election audits – but it had fostered significant new understanding between groups sometimes at odds. It demonstrated that various stakeholders – all sharing the goal that elections be as effective and efficient as possible – can work together far better in the future. That was encouraging to everyone there. It's demonstrated here in this paper – in this cooperative initiative between all of these stakeholder groups.

So audits are the current buzz and they promise to be even more so by the time the August primaries come around. The reason is that the same people that raise concerns about electronic tallies, say that model audit provisions substantially reduce the chances that electronic tallies might conceal significant error. In other words, that model audit provisions can substantially raise public confidence.

Model Post-election Audit Provisions

Model, or excellent, post-election audit provisions are two things: they are a bit complex to understand at first; then once understood, they are not particularly daunting to consider implementing. Understanding them requires breaking down several component pieces and understanding them one at a time. This is best done

with the assistance of election officials already performing audits in their states, and technical experts for a couple of the “technical parts.” Next, understanding whether or not they are burdensome to implement – including all aspects of time, people and money – is best done by consulting those experienced election officials again, and performing a few cost projections to zero in on Florida’s specific conditions since each state is different.

Model Post–election Audit Provisions Deconstructed

One reasonable way to understand model post–election audit provisions is to break the process into seven components:

1. Definition and Purpose
2. Audit Method
3. Selection of Samples
4. Counting Process
5. Triggers and Escalation
6. Transparency
7. Resources

1. **Definition and Purpose:** This was discussed at the top of this paper.
2. **Audit Method:** Generally, there are three approaches to post–election audits:
 - a. **Fixed percentage model**, as passed in HB 537 in Florida (1–2%) and passed in Connecticut (10%) California has performed 1% audits of all races for the past 40 years.
 - b. **Tiered model**, depending on the apparent margin of victory. (Like Holt HR 811 and Nelson S. 2295, both of which call for 3–5–10% tiered models)
 - c. **Statistically significant** or “risk–based” model. Sample size is dynamic, based on how many ballots must be counted to yield a statistical “power of confidence.” Statistical power of confidence method is:
 - i. **More effective** than fixed or tiered audits because it confirms each audited tally to a mathematically–defensible level of confidence that outcome–changing error was not overlooked.

- ii. **More efficient** than fixed or tiered because resources are more concentrated where needed and not wasted where they are not. Most races require very small paper ballot counts to confirm machine tallies (less than even 2 or 3 percent) Resources are saved for the very few close races that require higher paper ballot counts to demonstrate the confidence level. With fixed or tiered methods, most races are audited by hand counting many more ballots than necessary, while the few close races are not audited enough.

99% confidence level is reasonable: Provides confidence that only one time in a hundred such audits, result-changing error might go undiscovered. This would be too low a confidence level for bank transactions or airline maintenance for instance, but is a reasonable standard for elections, given balancing needs for urgency and resource efficiency. (This must also be balanced with requirements for the number of races that must be audited.)

3. Sample Selection Method

- a. Establish number of races to be audited. e.g. Federal, top State, some other races. This is decided in bill-drafting and typically might include 10-12 races statewide and may or may not include additional local races.
- b. Units - e.g. precinct, machines, or batches depending on statute - must be randomly selected after the polls have closed and the results have been tabulated and recorded.
- c. "Batching" absentee, early voting, provisional, and overseas ballots into "units" or ballot batches provides important benefits
 - i. Privacy is preserved for absentee, provisional, and overseas ballots. Precinct or machine based samples can unacceptably expose ballot identity. (This is a particular issue for small jurisdictions or precincts.)
 - ii. Complexity is considerably reduced for absentee, provisional, and overseas ballots when batched because officials do not have to search through ballots to find specific precincts or machines for auditing. (This is a particular issue for large jurisdictions)

- d. Software independence is essential:
 - i. Sample selection is easily accomplished with low-tech, software independent means such as using ten-sided dice.
 - ii. Software independent sample selection is essential to post-election audits because one primary goal is to check for error in machines using software. Introducing more software in the audit procedure undermines this purpose.

4. Counting Process

- a. Three or four person teams seems to work best
- b. “Blind counting” is essential, meaning counting personnel do not know the machine tallies that their counts will eventually be compared to.
- c. Other best practices can easily be developed in bill-drafting, rulemaking, and specific practices adopted by counties and subject to public comment.

5. Triggers and Escalation

- a. “Triggers” define what happens when defined levels of discrepancies are found between manual counts and machine counts. Typically a one tenth of one percent (0.1%) change in a candidate’s vote share might trigger “escalation.”
- b. “Escalation” refers to additional counts “triggered” by the appearance of some defined level of discrepancies. Typically, the first appearance of a trigger would require a second number of randomly selected units equal to the first number of units counted. For instance, if 5 precincts, or units, were being counted, a trigger would mean 5 more have to be counted.
- c. It is not hard to clearly define all triggers and escalation in less than a page of statutory language.

- 6. **“Challenge” Audits** – because even statistics aren’t perfect. Allowing candidates, election officials or independent auditors to choose some precincts of high interest (in addition to the random sample) will further bolster confidence for all stakeholders. This also allows a more efficient application of random sampling

since obvious discrepancies can be investigated without depending purely on the random selection process. The random process can therefore be geared toward finding less obvious but more numerous discrepancies, which actually saves resources.

7. Transparency is essential throughout all auditing procedures. Clear public access, that does not interfere with the conduct of the audits, should be codified appropriately in both statute and rule. A primary goal of conducting audits is to increase public confidence in the results. It would be counter-productive not to plan for high standards of transparency at each step so the public can see for themselves how all aspects are conducted.

8. Resources: Model audit provisions require little more resources than inferior provisions – sometimes less. The dynamic modeling of statistically based audits means resource demand will be light for all but very close races. Resources are kept in reserve for very close races and all stakeholders will be appreciative that those are the races that receive the greatest level of auditing review so that confidence in their results is kept high.

- a. [insert cost analysis reduced to cost per registered voter or cost per vote cast or cost per hand counted vote and also shown as percentage of overall cost of elections on the same basis. \$.08–\$.30 was discussed in Panel 4 or Panel 8 as I recall, and as 10% or less of overall costs, but I don't know if figures were hypothetical or meant to approximate actual]
- b. [either here or at already over-loaded #2 above, insert graphs comparing sample sizes and confidence levels in the same elections using fixed, tiered, and statistically based models. Ensure examples include demonstration that many races would be over-counted in fixed or tiered models.]

Why 2008? Why not wait until 2009?

1. **Two technical problems should be corrected now.** Using “units,” or ballot batches, for absentee, early voting, provisional, and overseas ballots, solves

both problems. The change should be made before the problems ever get started.

- a. **Privacy of the ballot** is in jeopardy when samples are selected by precinct, especially in small jurisdictions and small precincts in all jurisdictions.
 - b. **Sorting through absentee and early voting ballots to find the few precincts to be audited is needlessly burdensome**, especially in large jurisdictions, like Miami-Dade's 780 precincts.
2. **Pending federal legislation would not affect a model audit provision but would force change to current provisions – to something worse than a model audit.** The current provision would have to be changed if HR 811 or S 2295 pass. But the 3-5-10% tiered provisions in those federal bills would be both less effective and less efficient than the model provision proposed here. This is not a problem. Both bills allow equal or better provisions in states, subject to NIST approval⁴. There can be little doubt that NIST would approve the model audit provision proposed here as statistically superior to 3-5-10% tiered model. Waiting to see how federal legislation affects states' audit provisions is moot if Florida passes model statistical audit provisions now.
3. **The current provision is a waste of resources and could actually hurt public confidence.** The current provision is inadequate for the purpose it is intended. Counting an arbitrarily set number of ballots in a single, randomly selected race will be of almost no value in raising public confidence and could hurt it. Suppose one close race is of particular public concern in the 2008 election.

First, it is highly unlikely that the "hot" race will be the one race randomly selected for audit according to the current provision. So while all the attention is on race A, resources will be wasted auditing race B that was likely decided by a sufficiently wide margin that no one is interested in those audit results.

⁴ "Sec 322 (b) USE OF ALTERNATIVE MECHANISM.—Notwithstanding subsection (a), a State may adopt and apply an alternative mechanism to determine the number of voter verified paper ballots which will be subject to the hand counts required under this subtitle with respect to an election, so long as the alternative mechanism uses the voter verified paper ballots to conduct the audit and the National Institute of Standards and Technology determines that the alternative mechanism will be at least as statistically effective in ensuring the accuracy of the election results as the procedure under this subtitle.

Second, if the close race happens to be randomly selected for audit, the current provision may only make matters worse. In a very close race, a 1–2% audit will yield only a very low statistical power of confidence. The public and the media can be trusted to waste little time pointing this out. With sound statistically-based audits now in the public thinking, it will be worse for all stakeholders when the 1–2% audit can be accurately described as having less than 50%, and perhaps as low as 20% power of confidence, that it may have. This will mean it can accurately be said that in half or more such elections, outcome-altering error could have been overlooked. Public confidence in all elections plummets. Scrutiny of the close race only intensifies despite having conducted an audit.

The statistically based model proposed here will be an effective use of resources by its very design. Everyone benefits. Resources will be focused where they are needed most – on the close race, and few resources will be spent on races less in question. All stakeholders are better served. Election officials are seen by the public doing excellent work worthy of increased public confidence in results of all races and especially the very close “hot” race, instead of appearing foolishly auditing the wrong race.

4. **Don't recounts already accomplish the same thing?** This is a very reasonable question but recounts do not serve the same purpose as audits. Recounts look only at very close races, are rarely triggered, and offer quite limited benefit to the public's confidence that machine tallies are trustworthy in each election. Florida's .5% machine and .25% manual recount triggers are insufficient to increase public confidence in elections overall. A race decided by .51% or more receives no review. Most elections will not see recounts at all. Audits become part of standard election practice to check machine tallies, increasing public confidence. Effective audits and recounts serve separate purposes, though it would be useful to review Florida recount provisions in future to ensure they effectively perform as intended and that the combination of audits and recounts do not cause unnecessary duplication of effort. That said, to reduce redundant

work, statutes can be written that would allow a properly conducted audit to count towards a full recount.

5. **Current provisions drive routine issues to court, resulting in needless cost and embarrassment.** Current reporting deadlines, including reporting audit results *after* certification, mean that routine error correction arising from good audit practice will appear more as election failure than good practice. This is unfortunate and unnecessary, driving issues into court needlessly. (Also see *Note on Certification Deadlines* below)

6. **Florida needs a break.** There's no going back to the days when, "Trust us, we know what we're doing," will satisfy Floridians that elections are as effective and efficient as they should be. "See for yourself," or even "Bring it on," will serve Florida election officials much better in 2008 and beyond. Let's face it, the public and the media will "bring it on," in another big hot race anyway. It's right in many ways, and beneficial to everyone, to waste no more time before putting bullet-proof election practices in place. Without improved model audit provisions in Florida law – the essential complement to paper ballots – future elections are more like minefields despite all the hard work election officials do to get them right. Florida must have outstanding audit procedures to go with its shift to paper ballots, if 2008 is going to be approached with real confidence that elections will be businesslike, instead of nightmares.

Pilots

We recommend several pilot audits be conducted unofficially immediately after the January Presidential Preference Primary election. Perhaps two each from small, medium, and large jurisdictions – or six in all – could pilot a model statistically based audit. Perhaps officials from neighboring jurisdictions could assist so that what is learned is more widely disbursed. The greatest benefit will arise from the added participation of the Secretary of State's office. Preparation needs, logistics, transparency, methodology, and resource requirements are all sure to be well–

instructed by such pilots – while there is still sufficient time to tweak bill language, rulemaking, and plans for training and implementation.

Perhaps funds to defray the modest cost of pilots could be appropriated from a combination of sources, further engendering broad-based support, including DOS, FSASE, FVC organizations, and other outside resources.

The Political Calculation

Time is tight. Amendment to Florida's audit provisions needs broad-based legislative support, early passage, and expedited rulemaking in order to give supervisors time to train and implement effectively. Working together, it is entirely doable. If this Joint Audit Working Group can come together to support carefully researched and reasoned change to Florida's audit provisions, it is likely to succeed.

Members of FSASE must get the work done in the elections. Members of a wide range of organizations, represented by the Florida Voters Coalition, have much to do with setting the tone of acceptance or skepticism with election procedures and results. Technical experts, represented here by the Advisory Panel, will have much to do with supporting the science behind Florida's conduct of elections, and whether adequate safeguards are in place. Working together, our groups offer a compelling position, triangulated from different points of view not often seen together.

Working together, this group is likely to win considerable support from the public, the media, and perhaps the Governor and the Secretary of State as well. The time is right for this – now – for the 2008 legislature. Working together will foster the bright, positive spirit of cooperation that lives up to America's promise of civic participation and shining democratic governance. The legislature will be presented with an overwhelming case to do this now. It is absolutely feasible politically.

Conclusion

Replacing Florida's inadequate 1–2% audit before its July 2008 effective date, with a model statistically based post-election audit, benefits all stakeholders. It's reasonable,

manageable, and politically viable. It's necessary for 2008 both for technical and the more general purpose of raising public confidence in all Florida elections. It is the essential compliment to Florida's shift to marksense ballots, without which, many of the advantages of that shift are lost. All the necessary ingredients are in place for this to happen now and the moment should be seized with vigor.

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- Susan Gill*, Administrative Rules Committee Chair, Supervisor of Elections, Citrus County

From Florida Voters Coalition

- Pamela Haengel*, Vice President; President, Voting Integrity Alliance of Tampa Bay
- Dan McCrea**, President

From the Advisory Panel

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- Mark Lindeman*, Ph. D., Assistant Professor of Political Studies, Bard College (helped write the New Jersey bill) (co-author of the SAFE report)
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Note on Certification Deadlines

Under current Florida law (audit provisions effective July 2008), election reporting deadlines are as follows:

- Certified results: Primary: 7 days; General: 12 days⁵
- Audit results: 11:59PM on the 7th day *after* certified results⁶
- Election contest: 10 days after certified results⁷

Reporting election audit results *after* certification makes little sense and is unique to Florida among the 50 states. It makes as much sense as reporting a vehicle's inspection results *after* declaring it safe to drive. It makes much more sense to report audit results *before* certification because they are a check on the counts included in the certified results.

Florida has some of the shortest certification deadlines in the country – 7 days in a primary and 12 days in a general election⁸. Audits, as of July 2008, must be reported 7 days after certification while election contests have an additional 3 days to be filed.

This means that certified results are reported without the benefit of audit checks. When audits are reported, should they raise reasonable cause to challenge the certified results, election contest is the only method remaining to make that challenge, turning what should be routine adjustments to initial errors, into burdensome, embarrassing litigation.

⁵ **102.112 Deadline for submission of county returns to the Department of State.—**

(2) Returns must be filed by 5 p.m. on the 7th day following a primary election and by noon on the 12th day following the general election. However, the Department of State may correct typographical errors, including the transposition of numbers, in any returns submitted to the Department of State pursuant to s. [102.111](#)(1).

⁶ [Effective July 2008:] **101.591 Voting system audit.—**

(4) The audit must be completed and the results made public no later than 11:59 p.m. on the 7th day following certification of the election by the county canvassing board or the local board responsible for certifying the election.

⁷ **102.168 Contest of election.--**

(2) Such contestant shall file a complaint, together with the fees prescribed in chapter 28, with the clerk of the circuit court within 10 days after midnight of the date the last board responsible for certifying the results officially certifies the results of the election being contested.

⁸ Oregon allows 31 days and New York 25 days after an election for certification.

Whether it is a good idea or a bad idea to amend Florida's certification deadlines in 2008 might be considered *separately* from model audit provisions. While challenging results based on audits is needlessly escalated to litigation under current (July 2008) provisions, there remain 48–72 hours after audit results are announced to file a contest, meaning the audits still serve a purpose.

If one calculates that model audit provisions *and* extension to certification deadlines is too much to stuff into 2008 agenda, we suggest it is best to delay certification adjustments until 2009 and concentrate on passing a model audit provision in 2008.

On the other hand, we support correcting both the rush on SOEs to conduct their work thoroughly and carefully imposed by short certification deadlines, and allowing audits to take their proper place as part of routine good election practice to be reported *before* results are certified, by amending Florida law to extend certification deadlines, at the earliest opportunity that these amendments can be made.

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