

Thoughts on the Nov 16, 2006 1% Manual Tally in Yolo County

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November 25, 2006

Summary. I think the 1% manual tally went very well. Yolo County's Elections Office uses good practices that do an excellent job of supporting confidence in the counting of the votes and in the accuracy of the voting equipment. These practices would make an excellent example that others could learn a lot from, and would be a great model to emulate elsewhere throughout the nation. Below, I comment on aspects that were done well and on a few opportunities for improvement in the future, in an attempt to document my reactions to observing the 1% manual tally in Yolo County on November 16, 2006.

1 What went well

- The Yolo County Election Office encouraged public observation. Staff members were uniformly welcoming to observers and gave observers opportunity to observe the entire process in detail, without restrictions. Supervisors took time out to answer questions in a friendly and forthright manner. The entire atmosphere was welcoming to observers and a model of transparency.
- The Yolo County Election Office provided notice of the date and time of the 1% manual tally (including the random selection of precincts) at least three days in advance. This is very good; it makes it easier to observe the 1% manual tally, which is one of the most important opportunities for outsiders to verify the election.
- The process for selecting precincts to be recounted was open to public observation.
- Not only was the selection process random; more importantly, it also was conducted in a way that makes it possible for observers to verify that the selection was random. The process was easy to understand and to verify to be fair. This is very good.
- All precincts were selected randomly using a verifiably random process, including both the precincts in the initial 1% sample as well as all additional precincts selected (in compliance with California law) to ensure that every contest is represented in the sample at least once.
- All ballots were fully counted before the random selection process was begun; no ballots were yet to be tabulated at the time the selection was performed. The 1% manual tally was effectively the last step before certifying the results as official. This represents excellent practice, because it ensures that the results that are certified are the ones that have been verified as part of the audit.

- The 1% manual tally included all ballots, including polling-place ballots (whether cast on paper ballots or on the eSlates), absentee votes, damaged and re-made ballots, and provisional ballots. No ballots were excluded or prevented from being manually recounted. This is excellent practice, because it gives us a way to verify the correctness of all the categories of ballots (no categories are left unverified).
- Before the random selection, observers were provided with a list of all the precincts, along with the ballot type assigned to each precinct; and a list of all ballot types, with information about the contests present on each ballot type. This is good, because it helps observers to verify for themselves that the random selection process was done properly.
- The manual recounts began immediately after the random selection. As soon as the 1% sample was chosen, ballots for those precincts were pulled from storage, tally sheets were prepared, and the manual recount boards began the recount. Observers had an opportunity to observe all the operations of the election staff between the time the selection was performed and when the recount was begun. This is good, because it makes it easy to verify that no “funny business” with the ballots or with the electronic equipment occurred that might affect the selected precincts specially. In other words, it allowed observers to verify that all precincts were treated equally, and thus it allowed observers to verify that the selected precincts were indeed representative of the county as a whole.
- There was an opportunity to observe the manual count of all selected precincts. The manual recount boards appeared to use good procedures for recounting the ballots. At least one full-time Yolo County Election Office employee was present at each table. All workers appeared to be diligent, conscientious, and careful to count correctly. When occasional mistakes were made (as is inevitable), members of the recount board were good about attempting to correct it in a careful way.
- In my observation, manual recount boards were good about calling a supervisor for help when any unclear situation occurred. From what I saw, supervisors appeared to give very good advice about how to handle such situations. For instance, I observed two cases where manual recount boards asked for help because they wanted to know how the scanners would count an ambiguous ballot; Tom Stanionis correctly figured out what they really needed to know was how to count an ambiguous mark on the ballot, told them to ignore how the optical scanner might count votes, and told them that the intent was for them to perform their own independent count. He also stated that the idea was to count it as a vote if it is possible to clearly ascertain voter intent, and he helped them to do so. This seemed exemplary to me.
- The process was a blind recount: manual recount boards were not given any information about the “expected” vote totals and appeared to be unaware of vote totals when performing the count. This is very good, because it prevents the recount boards from being swayed by knowledge of the “expected” answer and ensures that the manual recount is an independent count.
- Staff were willing to discuss the discrepancies that were encountered and help understand what might have caused them.
- Staff were happy to provide a detailed report of unofficial vote totals, broken down by precinct, in a convenient electronic form, when asked. The report was provided as a .CSV file, which

is excellent because it is easily accessible using standard spreadsheets and is well-suited for more detailed analysis. The vote totals were further broken down by polling place vs absentee vs early voting, which is good.

2 Opportunities for improvement

Almost all aspects of the 1% manual tally were very positive, but here are several opportunities for improvement that might be worth considering for future elections:

- It might be helpful to have written procedures describing the processes used for the random selection and the rest of the 1% manual tally. There are many gray areas in the law that are left to the discretion of election officials. It might be useful to document the stances that the Yolo County Election Office has taken on those issues.
- It would be helpful to make the unofficial vote totals (broken down by precinct, in convenient electronic form, showing the latest most up-to-date tallies as of just before the random selection) available to observers before the random selection. For instance, these totals could be provided to observers shortly before the random selection, or they could be made available on the Yolo County Election Office web page the evening before the random selection. Staff could also take that opportunity to archive these totals to read-only media (e.g., CD-ROM).

I realize that this adds another step to a time-sensitive operation, but I generally recommend that this be done so that observers (and county staff) can be sure that the tallies do not change after the 1% precincts are selected. For instance, if skeptical observers did not trust the voting equipment, they might ask whether it is possible for vote counts on the main database to be changed after the random selection (e.g., by malicious code in the voting software), in a way that uses knowledge of which precincts were selected to avoid detection. While this threat might seem far-fetched, making the latest precinct-by-precinct vote totals available to observer before the random selection ensures there can be no possibility of such an attack. This recommendation ensures that such shenanigans are completely impossible, so there can be no question of such a thing.

Incidentally, I don't consider the failure to do so on November 16 to be a failure on staff's part. As an observer, I simply forgot to request such a report shortly before the random selection. That was my fault. However, in the future, it would be a nice improvement to make these unofficial totals available to observers at the 1% manual tally before the random selection, even if observers do not think to ask for it.

- The initial manual count performed by manual recount boards was a blind count: they were unaware of the "expected" tallies. However, if there was a discrepancy between the manual tally and the "expected" tally (i.e., the tally from the computers), then at that point the manual recount boards were told the "expected" tally: for instance, they were told approximately ~"you are one vote short for candidate Smith; please go back and recount the ballots for Smith to see if you can get 161, instead of 160."~ Thus, the second count was not a blind count.

On first glance, it seems to me like it might be slightly better if the second count was a blind count, just like the first count. However, maybe I'm missing something. It's possible there

may be other reasons I have not considered for the current practice. Therefore, I recommend that this issue be considered to see what practice is best, if it has not already been.

- I noticed that the manual recount boards did not count the number of ballots (i.e., the number of pieces of paper) at any time. The boards counted the number of votes for each candidate, but did not count undervotes or overvotes. When there was a mismatch between the electronic tally and the manual tally, it was hard to know whether this was because some ballot was missing or whether this was because the same ballots were interpreted in different ways by the humans vs. the electronic scanners. There appeared to have been multiple cases where the number of paper ballots given to the manual recount board did not match the number of ballots recorded as scanned in the computer system. It might make sense for manual recount boards to count the number of paper ballots given to them and make sure that they received the correct number of ballots.

One possibility would be for recount boards to quickly count the number of ballots they receive, as the first thing, as a sanity check. Another possibility would be to count the number of ballots only if there is some discrepancy between the manual vote counts and the electronic vote counts. A third possibility would be for recount boards to count not only votes for each candidate, but also count the number of undervotes and the number of overvotes in each recounted contest. (Then the sum of the number of votes for each candidate, plus the number of undervotes, plus the number of overvotes, should allow one to infer the number of ballots given to the recount boards.) I'm not sure which, if any, of these possibilities make the most sense. This might be worth thinking about for future elections.

- I do not mean to criticize current practice, but as a matter of efficiency, it may be possible to make the random selection slightly more efficient with a little more advance preparation. California Election Code requires that, after the initial 1% sample is chosen, additional precincts must be chosen to ensure that every contest is represented among the sample. On November 16, the Yolo County Election Office chose these additional precincts by checking which districts were unrepresented in the initial sample, and then repeatedly picking a precinct at random until a precinct was found that appeared in one of the unrepresented districts.

The procedure used on November 16 works fine from a security, reliability, and transparency point of view; it is perfectly adequate. Its only disadvantage is that, in some cases, it might take many rolls of the dice to choose the additional precincts. For instance, imagine if there was a contest that appeared on the ballot at only one of Yolo County's 146 precincts. It would take, on average, about 146 rolls of the dice before this precinct was chosen, which could take a while. This is an extreme example. If there is a contest that appears in only two precincts, it would take about 73 rolls on average to hit this contest; for a contest that appears in only three precincts, it would take about 49 rolls on average; and so on.

Here is an alternative procedure that may be slightly more efficient. Staff would prepare in advance a number of lists: one list for each district, showing the set of precincts associated with that district. After the initial sample was chosen, for each district not represented in the initial sample, staff would take the list of precincts for that district and randomly select one precinct from that list. This could be done using dice, too. For example, suppose that after the initial sample is chosen, there is one district that is not represented among the initial sample, and suppose that this district contains 7 precincts. The list of precincts for

this district would be pulled, the precincts numbered from 1 to 7, and a single 10-sided die would be rolled to randomly select one of those 7 precincts. (Of course, upon rolling a 8, 9, or 0, one would re-roll until one obtains a 1, 2, 3, 4, 5, 6, or 7.)

This revised procedure might go slightly faster than the one used on November 16. I emphasize that there is nothing wrong with retaining the current procedure, exactly as it was done on November 16, if that is preferred for any reason. I mention this alternative only because it might save Yolo County staff a little bit of time.

- This is not a criticism of current practice, but in the future if Yolo County uses the eSlates and the MBB's to download results directly in electronic form (rather than duplicating those ballots onto paper ballots), it might be nice if it were possible to pull the VVPAT printers for those machines immediately after the random selection and demonstrate to observers that the VVPAT printers remain sealed (with the seals still intact and untouched since election day), before beginning the recount.
- Very minor: I noticed that different manual recount boards used different procedures for counting the ballots. Some chose a single contest, sorted all the ballots into one pile for each candidate, and then counted each pile. (After the first contest was finished, this was then repeated for each contest.) Some chose a single contest, and flipped through the ballots in order calling aloud the name of the candidate marked in that contest. (This was repeated for each contest.) Some chose several (e.g., four) contests, and flipped through the ballots in order (because those four contests all fit on a single tally sheet). One recount board went through the ballots in order, and for each ballot they read out all of the selections on that ballot in order (e.g., calling out: "Governor: Schwarzenegger, Lt. Governor: McClintock, etc."). I can understand why each manual recount board was allowed to use whatever procedure it was most comfortable with. However, I couldn't help wondering if some procedures were more efficient than others, and if so, whether it would be helpful to recommend that boards consider using the more efficient procedures. It might be an interesting experiment to time how long each recount board takes to count a certain number of ballots and contests and see whether it is possible to draw any conclusions about the relative speed of the various methods. I'm sure there is a long history and a lot of history with how best to organize and conduct manual recounts, so maybe there are good reasons for doing things the way they are done. The choice of counting methods does not seem to affect transparency, security, or the effectiveness of the 1% manual tally; it presumably affects only efficiency. Consequently, I consider this very minor, but I thought I'd mention it.