

# NATURAL LAW PARTY

## *of Nevada*

October 19, 1998

The Honorable Frankie Sue Del Papa  
Attorney General  
Via Fax # 702 687-5798

Dear Attorney Del Papa,

Last week as candidate for Secretary of State, I was privileged to watch the accuracy certification boards in both Clark and Washoe Counties. I had spoken to both Registrar of Voters prior to the visit and they had explained how their systems worked. Clark County also very kindly faxed me 28 pages of articles and reports about the certification of their system for early voting. I was treated with utmost respect at both locations and was allowed to ask questions.

The Washoe County tests appeared to meet the requirements of the Nevada Revised Statutes (NRS) for "Testing of Equipment and Programs." However, it appears that the Nevada Revised Statutes have not been followed in the certification process in Clark County. In Washoe, several observers were there from various political party organizations and candidates. If you wonder why no one else is questioning the Clark test process, I was the only observer for the Clark tests!

The following pages give a brief overview of the two systems, a short description of the tests that were performed, areas of concern with conforming to the NRS requirements, a summary of concerns, and a proposal for what could be done before the election to rectify the problems.

Before attending the certification, I had wondered how it would be possible to test all 1,836 machines in one day. The Clark certification process took a little over two hours. How? Because none of the voting machines had even one vote entered from the ballot panel. Would you want to buy gas at a station where none of the pumps were certified?

Because the Clark machines have no paper ballot (other than the one generated later by the machine), it becomes imperative that each individual machine be checked thoroughly - as required by the NRS. 62% of the registered voters reside in Clark County. Thus it is not just Clark County that is affected by the integrity of the voting machines, but all statewide and federal elections are also affected. If the tests are not performed according to the NRS requirements, it could call into question the results of the upcoming election.

Due to the nearness of the election, I would greatly appreciate your prompt consideration of this matter.

Sincerely,

Lois Avery  
Candidate for Secretary of State

**Overview of the Two Systems:** In case you are unfamiliar with the two systems, I will outline the basics for clarity in the future discussion. This is just a broad overview, I am not knowledgeable about many of the finer details. Both systems have a Program/Data device that is installed on each voting machine. I have been told this device: 1) Holds the program which tells the machine how the ballot is laid out and varies depending on the candidates and issues in each precinct and on which precincts can vote on the machine. Clark has 255 versions for this election. 2) Tabulates the vote total for each candidate and issue after each vote is cast. These totals are printed out as a results tape at the end of election day. The tape has each candidates name and the number of votes received. 3) The device in Clark County also records a "ballot image" where the candidate or issue is recorded in code (Harry Reid might be D17).

**Washoe County Optical Scan System:** The program that tells the optical scanner how to count the votes is in a program/data card (which is "locked" in with a numbered seal after the early test). At the polls, the voter marks the choices on a paper ballot which is then placed in a voting machine which (1) scans the ballot, (2) tabulates the votes onto the card, and (3) feeds the ballot into the locked box below the scanner. At the close of the polls an "End Ballot" is fed in and no more ballots will be accepted. The Unit then prints out 2 copies of the totals - one to be sealed with the ballots and returned to the Central Office and one is posted on the wall at the polling place. It then calls on a telephone line and transfers the data via modem to the central computer.

Because the voting machine is only used for the brief time to feed in the ballot, only one or two units are usually necessary at a polling place. For the entire county there are 116 units.

The mail-in ballots are automatically fed into a larger, scanner-only unit which transfers the scanned data directly to the main computer for tabulation. The main computer then combines the totals from early voting, main-in ballots, and election day voting.

**Clark County Direct Recording Electronic (DRE) System:** The program/results cartridge that tells the machine how the ballot face is allocated is plugged in the back of the machine and locked in with a numbered seal. At the polls, the voter enters the vote directly into the machine. The voter pushes a button by the candidate selected, a light turns on next to the name and the candidate name is shown in the LCD display below the ballot panel to confirm the vote. When all the selections are made, the CAST VOTE button is pushed. This push (1) tabulates the vote in the machine memory, (2) stores a ballot "image" in a random memory location (for secrecy), (3) tabulates the votes on the results cartridge and (4) stores a ballot "image" on the results cartridge. At the close of the polls, the machine is closed to voting and results tapes are printed for posting at the polls and for the central office. The results cartridge must be removed and taken to the central office so its totals can be read into the main computer.

Because the DRE machine receives the vote directly, more machines are needed at each polling place. Clark has 1,836 machines. (They have about 3 times the number of registered voters as Washoe County, so they would at most need 348 optical scan machines.)

The mail-in votes are on punch cards and counted on a punch card reader. The totals are then combined with the early voting polling machine totals and the election day polling machines.

There are thus 3 tabulating systems in both Clark and Washoe: 1) the machines used at the polls on election day (DRE in Clark and optical scan in Washoe), 2) the machines that read the absentee ballots (card reader in Clark and automatic feed optical scan in Washoe), and 3) the computer system that takes the results from the other tabulating equipment and gives grand totals by precinct. My concern here is with the machines used at the polls on election day.

Let's look at what happened in Clark County and Washoe County for the tests performed before the first day of early voting as required by NRS 293B.150. "...a county or city that uses a mechanical recording device which directly records votes electronically shall test the automatic tabulating equipment and programs to ascertain that the equipment and programs will correctly count the votes cast for all offices and on all measures."

**Clark County**  
**1,836 Sequoia Pacific machines**  
**Test Time 2 1/2 hours**

I had wondered how long it would take to test all 1,836 machines. After a short time at the certification, it became obvious that not only were they not going to test all of the 1,836 machines, *they were not going to test a single one of the machines.*

When the certification board arrived, the program/data cartridges for all the ballot "styles" from 255 machines (248 regular and 7 early voting) had already been loaded with **vote simulation data**. This vote simulation data had been recorded on the cartridge NOT by entering the votes from the front panel (as a voter would do) but by inserting an auxiliary cartridge in the second hole in the back of each machine. This auxiliary cartridge had been pre-programmed to enter the test votes into the machine. I was told that during simulation the lights and LCD display are activated as if a button was pushed by a voter - but rapidly.

The board watched the data from 255 cartridges be totaled by the main computer system and compared the totals with those predicted by the people who made the simulation cartridges. No tape printout from the individual machines was ever compared to the results in the main computer. No ballot images were ever printed and compared to the vote total.

Cartridges are eventually "sealed" with a numbered tag into the machines - but these cartridges have never been certified by the accuracy certification board and the board does not seal them in nor make the numbered list.

The main computer room was not locked or sealed when the certification board left.

**Washoe County**  
**116 Global Election machines**  
**Test Time 13 hours**

Paper ballots were pre-marked so that every candidate and measure would receive either 1 or 2 votes. The 1 and 2 alternated as the candidates were listed on the ballot to provide easy visual checking of the votes and totals.

While the certification board watched, the optical scan machine printed out a totals tape which was checked to make sure it was all zeroes and then the pre-marked ballots were fed into their respective machines - not all precincts will be accepted by all machines. The END ballot was fed in. The total tape was checked for the appropriate 1's and 2's. The totals were then fed into the main computer for tabulation and the results were checked. *Every one of the 116 machines that was going to be used in the election was tested.*

The program/data card is then zeroed and sealed in the machine with a numbered tag, the number of the tag and serial number of the machine are recorded, and the machines stored in a locked room.

Any time the accuracy certification board is not in the room after the start of tests, the room with the main computer tabulating system is also locked and sealed.

When I described the Clark County test to the Washoe County certification board, one of the members, John Byerly, said that he would love to find a process that would allow them not to test every machine, but that there isn't one.

**NRS 293B.145 (1.)** says that "The accuracy certification board shall observe the conduct of the tests prescribed by NRS 293B.150 and 293B.165."

In Clark County the vote simulation cartridges 1) were made *before* the board arrived and 2) were not made by entering the votes from the front panel as they would actually be used on election day.

**NRS 293B.150** "...a county or city that uses a mechanical recording device which directly records votes electronically shall test the automatic tabulating equipment and programs to ascertain that the equipment and programs will correctly count the votes cast for all offices and on all measures."

Each of the 1,836 machines automatically tabulates the votes and prints the totals for each candidate when the polls close, so the machines are covered by this requirement. I would like to commend the Clark County Registrar's Office for developing a seemingly quick and efficient testing process, except that it *did not test even one* of the 1,836 machines where the vote is actually entered. If every machine was exercised to check for votes as required by NRS 293B.150, it would probably take at least 300 man hours (one person to enter and another to watch what is entered). But just because it is time consuming does not mean that the requirements in the NRS can be ignored.

**NRS 293B.155 (1.)** "The tests prescribed by NRS 293B.150 and 293B.165 must be conducted by processing a preaudited group of logic and accuracy test ballots so punched, voted or marked as to record a predetermined number of valid votes for each candidate and on each measure..."

This part of the statute says "a preaudited group," and one could say that the vote simulation cartridge contained the "preaudited group" of test ballots. However, the statute also says "voted or marked as *to record*." In Washoe the ballots are marked ahead of time, but the certification board watched them be recorded by running them into the voting machine. The only way to record a vote *as the voter will do* in the election is to push the buttons on the ballot panel and press CAST VOTE. The "preaudited group" in this case would be papers that were marked as to how each precinct was to be voted. This is how they were tested when the early voting machines were tested in Clark County for early voting in July 1996 by Dr. Micahel Shamos. When the auxillary cartridge exercises the machine to enter data into the data cartridge, the lights may come on, but the buttons are not pushed. There is no way to know by watching the lights come on what caused that light to come on or what would make the light come on when a person is pushing buttons on the panel. It also does not test for the alignment of the ballot face with the candidate names with the proper buttons. The ballot face must be changed for every election.

**NRS 293B.155 (1.)** "...and must include for each office one or more ballots which have votes in excess of the number allowed by law in order to test the ability of the automatic tabulating equipment and programs to reject those votes."

The Sequoia Pacific machines will not allow votes in excess of the number allowed by law to be voted *if each office is programmed properly*. This can only be tested from the front panel and visually verified - there is no record that I have been told about that indicates that someone tried to push an extra button. The certification board would have to verify this visually, at the individual machines. (Clark specifically tested for this on the punch cards.)

**NRS 293B.155 (3.)** "...seal the program, the reports, and all test material in an appropriate container..."

In Clark, the part of the program that gives the layout of the ballot for each machine is on the cartridge. Not one cartridge was sealed in the container. The 255 cartridges were part of "all test material." They were not sealed in the container that was signed by the accuracy certification board. In Washoe, the test program/data cards were sealed in the container or sealed into the voting machines, which were then stored in a locked room.

### **Election Day Test NRS 293B.165**

Though this test has not been performed yet, the Clark County Assistant Registrar of Voters, Bernie Matsko, explained how it would work. The absentee and early voting would be zeroed and tested as in the pre-early voting test we just watched, BUT the results from the 248 election day cartridges would be left on the main computer. They will not test them before the election as they will be sitting in voting machines at the polling places. Thus the totaling program in the main computer will not test the reading in of the election day machine cartridges for each ballot style immediately before the start of the official count of the ballots as required in this statute.

### **Summary**

In an earlier Sequoia Pacific certification report for the State of Texas in November 1989, Dr. Michael Shamos said, "It is important to understand the conditions under which the audit trail might fail to be usable. The first possible problem would occur if the ballot setup procedure is performed incorrectly, causing the unit to record the voter's choices incorrectly as they are being entered. This case can be adequately guarded against by thorough pre-election testing." Since the program in the cartridge with the candidates and issues is changed every election along with the ballot face, entering a preaudited group of votes from the front panel is the only way to thoroughly test each cartridge.

It does not appear that Clark County is fulfilling the requirements outlined in the "Testing of equipment and Programs" as laid out in the Nevada Revised Statutes. It is not only the statutes that require this testing, but any concerned voter would want reassurance that the machine that was recording their vote had been tested for accuracy. This is especially crucial where there is no paper ballot other than that generated by the machine and we are depending entirely on the correct functioning of the voting machine.

- 1) The accuracy certification board did not observe the recording of the votes on the vote simulation cartridges.
- 2) Even more troubling, the vote simulation cartridge results were "voted" by another cartridge installed in the back of the machine. While the accuracy certification board was there, not one vote was cast from the panel that is used by the voter .
- 3) Since the program for the ballot information is on the cartridge, **every** cartridge would have to be tested to verify that it will "correctly count the votes cast for all offices and on all measures." Only 255 were "tested" with the programmed votes *from the back of the machine.*
- 4) "Over vote" was not tested from the ballot panel.

- 5) The program on the cartridge used for the test was not sealed in the container.
- 6) "...all test material" must be sealed in an appropriate container - the 255 cartridges were not sealed (either in a container or a machine) for future contest of the results.
- 7) Unlike the early test I observed, the test required immediately before the start of the official count on election day will not include any cartridges from election day machines.

Until I witnessed the certification (or lack thereof), I had not considered how cumbersome a thorough pre-election test would be on 1,836 DRE machines. I am new to considering these issues. However, the three men on the accuracy certification board in Washoe County have had many years of experience. If you would like to consult experts in this area, Laura Dancer, the Washoe Registrar of Voters, could give you their names and numbers.

The inherent problems in certification of electronic machines were highlighted by the recent problem in California with gas station pumps. The pumps were found to be electronically altered to record the first gallon or two accurately and then to start "fudging". The stations received over \$12,000,000 in "extra" money for gas they never pumped. Unfortunately, the test required by the NRS would not protect against a fudging program like this which could start fudging after the first few votes or at a particular time on election day. However, even if not a total safeguard, the testing procedures required by the NRS are a minimum of what should be done to secure the integrity of our elections. The checking of only 255 because the rest are the same would be like only certifying one gas pump at each service station.

## What To Do Now

The question now is what can be done before the election to rectify this problem? The Clark County Voter Registrar's Office has already shown great organizing ability. The logistics of placing over 1,800 machines at polling places and training over three thousand poll workers requires careful planning and orchestration. The test with the 255 vote simulation cartridges was executed very quickly and smoothly. They now will have to put their expertise into organizing a true test of the voting machines as required by NRS.

It is not too late to perform the tests required on the election day machines. They would not meet the date requirement of NRS 293B.150. But if completed before November 3, 1998, the tests should prevent the results of the election from being called into question for not having performed the necessary NRS tests.

What needs to be done is to have the programming/results cartridge installed in each machine. The test vote pattern was already developed for the vote simulation cartridges, this could be printed out for use by the people who will enter the votes on the front ballot of the machines. The accuracy certification board should observe the casting of votes. As with other tests, all candidates and political parties should also be allowed to observe.

Votes could be cast by teams of two - they should not be of the same party, and the two people should be randomly assigned to the team. Then the teams should be randomly assigned to one of the 255 ballot styles and be given the pre-audited votes to perform the tests required in NRS 293B.150 & 155 (1.) It is possible that this whole process could be part of the training for the poll workers (maybe for the supervisors). The number of teams needed would depend on how quickly the whole process will take.

A random test of at least one of every 255 ballot styles would be the minimum. (All machines with the same ballot style would be grouped together on the warehouse floor and the team or certification board would choose one or more at random to test.) Since every cartridge has its own ballot face and tabulation program, the NRS requires every machine to be tested. (Would you like to go to a gas station where only one of the pumps had been certified??)

One machine of each ballot style would have two cartridges voted on it with the preaudited votes (This extra one will be used to fulfill the requirement of NRS 293B.155 (3&4), .165 & .170.) After the test, each machine would print out the totals and the certification board would confirm that the totals were the same as predicted. Immediately after the tape was certified, then the cartridges would be locked in its machine and sealed with the numbered seal. The extra cartridge of each style (total 255) would then be processed through the tabulation test previously used on the vote simulation cartridges. After that test, the cartridge would be sealed in an appropriate container as per NRS 293B.155 (3). They will then be available for inspection as indicated in NRS 293B.155 and for the election day tests required by NRS 293B.165 and for the final sealing of NRS

293B.170.

This will require an extra 255 cartridges. If Clark County does not have that many spares, hopefully the manufacturer will be able to provide them quickly.

Early Voting Machines: These have already started to be used. Ideally some more early voting machines should be thoroughly tested, as required in the NRS and then switched with the untested ones. The current ones should be withdrawn from early voting. I am not familiar with the necessity of retaining the results in early voting machines until election day - they may be able to be recertified for an election day machine.

Any early voting machine that will be used on election day will have to be recertified after the new election day cartridge is placed in the machine.

It should be understood that I am requesting this test as required by the NRS. This test will catch programming errors, but will not catch other forms of fraud. Like in the problem with the gas pumps where they measured correctly for the first two gallons and then started fudging, one could count the first votes correctly and then miscount for a given number and then revert back to counting correctly.

Dr. Shamos in his 1989 report on the Sequoia Pacific machines for the State of Texas points out, "The system also contains (sic) a feature that is of potential use to software intruders. For a variety of very good reasons, the internal computer maintains a real-time clock that gives both date and time. This means that it is theoretically possible to install a program that would activate only during the precise time when the election is in progress. Such a program would remain undetected during any amount of pre- and post-election testing, but could be discovered by a thorough (but lengthy and impractical) code audit." That is why the Nevada Gaming Control board inspects the actual code of the gaming machines, certifies a particular version of that code, and then confirms that the approved version is actually the one in use on the casino floor.

Obviously our voting machines are not as secure as either gaming machines or gas pumps. But this necessary step of performing the tests required by the Nevada Revised Statutes is the absolute minimum that we should require for dependable election results.