

## TITLE 19 COMMITTEE REPORT

To: Anne Milgram, NJ Attorney General  
Donna Kelly, Assistant Attorney General  
Division of Elections  
State of New Jersey  
Department of Law and Public Justice  
P.O. Box 304  
Trenton, NJ 08625-0304

From: Richard C. Woodbridge  
Darryl Mahoney  
John Fleming

Date: August 8, 2007

Re: Avante Vote-Trakker VVPRS  
Our Client No. 4108-134//G32,962

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On Thursday, July 26, 2007 representatives from Avante International Technology, Inc. presented the "Avante Vote-Trakker EVC 308-FF" with its accompanying Voter Verified Paper Records System (VVPRS) at the Armory on Eggerts Crossing Road in Lawrenceville, New Jersey. Present for the State Title 19 Committee were:

John Fleming, Management Information Specialist, Dept. of Law and Public Safety  
Daryl P. Mahoney, Assistant Director, Bergen County Voting Machine Division  
Richard C. Woodbridge, Patent Attorney, Synnestvedt & Lechner LLP  
Princeton, New Jersey – Chair

Appearing for the Vendor, Avante International Technology, Inc:

Rick Gleinn  
Greg Beasley  
Mike Ma  
David Alampi

Appearing from the Attorney General's Office:

Donna Kelly, Assistant Attorney General  
Jason Orlando, Deputy Attorney General, Special Asst. to the Attorney General  
Karen Du Mars, Deputy Attorney General  
Maria DelValle-Koch, Acting Director, Division of Elections  
Donna Barber, Senior Management Assistant, Division of Elections

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Appearing for NJIT:

Mitchell Darer, Executive Director, NJIT Center for Information Age Technology  
Yun-Quing Shi, Professor of Electrical and Computer Engineering  
Ari Jain, Special Lecturer in Division of Mathematical Sciences  
Chao Zhang, Ph.D. Candidate of ECE Department

Also appearing in the audience from Sequoia Voting Systems were:

Ms. Christine Valeriano, Sales Executive  
Mr. Joseph McIntyre, Senior Project Account Manager  
Mr. Andrew Wynham, Sr. Sales Technical Support Manager  
Ms. Annalisa Siracusa, Sequoia Counsel

The purpose of the hearings was to determine whether the new Avante Vote-Trakker EVC 308-FF VVPRS met the State of New Jersey standards entitled "Criteria for Voter-Verified Paper Record for Direct Electronic Voting Machines".

The meeting opened at approximately 10:20 p.m.

Mr. Woodbridge, Chair of the Title 19 Committee, introduced Mr. Fleming and Mr. Mahoney and then asked the vendor to describe the operation of the new Avante Vote-Trakker EVC 308-FF VVPRS.

The vendor initially demonstrated a first model, which appeared to experience difficulties with the printer and the printer module had to be opened to retrieve the paper ballot. A second machine was produced and was demonstrated to the Committee and those present. The vendor ran the machine, which was run in "Test" rather than actual voting mode, to show, among other things, how the machine deals with two spoiled ballots, and how the audio system worked for individuals with disabilities. The vendor was asked for copies of the test ballots. It was noted that test ballots did not include a bar code and the vendor was asked to produce ballots like those produced during an actual election which were, in fact, produced at a later time during the day.

Subsequent to that David M. Millstein, Deputy Director, ADA Administrator for the New Jersey Office of Disability Management, addressed the Committee and indicated that he, along with a visually impaired assistant, found that the Avante Vote-Trakker VVPRS generally met the standards of accessibility for disabled New Jersey citizens.

After Mr. Millstein's comments, Mitchell Darer, Executive Director of NJIT's Center for Information Age Technology, provided an overview of NJIT's role in the examination of voting machines in general. That presentation was followed by more specific comments from Professor Avidaman ("Ari") Jain who described the general testing technique employed by NJIT on the Avante Vote-Trakker VVPRS. That, in turn, was followed by comments by Dr. Yun Quing Shi who set forth in detail ten (10) "exceptions" that NJIT noted concerning their interpretation of the new State Criteria for the VVPRS as applied to the Avante Vote-Trakker VVPRS. The exceptions described by Dr. Shi are set forth in significant detail in the report furnished by NJIT.

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In general, Mr. Darer indicated that it was his belief that the Avante Vote-Trakker was generally suitable for use in New Jersey because it met two (2) core criteria, namely: 1) the electronic records always matched the paper records; and, 2) the four (4) independent systems always managed to keep in synchronization (i.e. the electronic votes, the paper ballots, the bar codes and the internal memories).

From approximately 12:00 noon to 4:00 p.m. the Title 19 Committee compared each relevant section of the VVPRS Criteria against the Avante Vote-Trakker VVPRS in conjunction with the "exceptions" furnished by NJIT.

At 3:00p.m. the Title 19 Committee review was briefly suspended for an appearance by the Honorable Brian Hughes, County Executive for Mercer County. Mr. Hughes presented approximately 10 minutes of comments describing his concern about the ability of Sequoia to provide reliable VVPRS in the past for the Sequoia Advantage machines that are used for elections in Mercer County. Mr. Hughes also voiced his concern about the possibility that the Federal government might change its mind and ultimately require optical scanners, all of which places counties, such as Mercer County, in a dilemma because there is a legislative mandate to have VVPRS capability in place on all New Jersey voting machines by February 2008. The County Executive's comments were noted with appreciation and incorporated into the record.

Public comment took place between approximately 4:00 p.m. and 5:00 p.m. The public was invited to speak and was provided with a sign up list. The speakers making presentations were:

1. Flavio Komuves, Deputy Public Advocate; and,
2. Professor Penny Venetis of Rutgers Law School

In summary, the Title 19 Committee agreed with NJIT's observation that the Avante Vote-Trakker VVPRS met the two basic core Criteria for a reliable voting machine and, in general, should be ultimately suitable for use in the State of New Jersey, however, it was the consensus of the Committee that before the Avante Vote-Trakker VVPRS are used in elections in New Jersey they should be demonstrated to NJIT and then to the Attorney General that certain shortcomings have been corrected. Those shortcomings are outlined below as follows:

1. The storage unit on some machines needs to be replaced or repaired so that unauthorized paper cannot be slipped into the storage unit.

NJIT's exception number 2 stated "a slit that exists between the storage unit and the printer may allow unauthorized or forged paper records to be slid into the storage unit."

NJIT indicated how on one unit it was possible to slip a business card or a piece of paper into the storage unit. The vendor subsequently produced another machine in which the front plates were co-planer and there did not appear to be a significant possibility of slipping a piece of paper into the storage unit. The Committee felt that this feature was significant enough that the vendor should be made to demonstrate that none of its storage units are capable of accepting unauthorized or forged paper records as noted by NJIT.

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2. The VVPRS needs to be modified so that a voter can't accidentally continue to cast electronic ballots after the machine detects a low paper supply without a proper audio or visual signal to the poll worker and a switching off of the machine.

NJIT's exception number 3 reads as follows: "If, during voting, the DRE detects a low paper supply, an error message window appears on the DRE screen. Pressing the "OK" button in the error message window closes this window and returns back the DRE screen as normal status. The voter has the opportunity to continue the voting operations and to cast the vote. However, a paper record is not printed out. This situation of no paper records being printed continues with subsequent votes, with no audio or visual signal to the poll workers, until the voter presses "cast ballot" twice, at which time the vote is electronically recorded without a paper record. The machines has to be reset for the next voter."

The vendor indicated that it would correct the above problem with a voter alarm and close the machine under the scenario outlined above. The vendor also indicated that such correction could be made within a week of the hearing.

3. The paper record needs to be able to identify which election is being held on the face of the paper ballot.

NJIT's exception number 4 reads as follows: "The particular election name (e.g. Primary Election or General Election) is not printed on the paper record."

The vendor indicated that they would correct this shortcoming.

4: Spoiled ballots should be clearly and conspicuously marked "VOIDED" or the like and accepted ballots should be clearly and conspicuously marked "ACCEPTED" or the like.

NJIT's exception number 5 reads as follows: "There is no clear acceptance information (e.g. "VOIDED" or "ACCEPTED"): 1) Voided paper records have the same identifier number as the final approved paper record cast by the same voter. The VVPRS appends (1) and (2) to that identifier number for the 2<sup>nd</sup> updated and 3<sup>rd</sup> updated paper records, respectively. (2) Some voided paper records may be incorrectly considered as accepted paper records if some updated paper records are lost."

The vendor indicated that once a ballot is printed the VVPRS is not capable of reprinting over that ballot. Accordingly, with the present vendor configuration, there is no way that terms like "VOIDED" and "ACCEPTED" can be placed on the ballot. NJIT and the Title 19 Committee did recognize that there were unique identifiers on the paper ballot but they were very small, subtle and hard to read. The problem is exasperated if one finds "Replacement One" and "Replacement Two" and no third ballot. How does one know if a third ballot is lost? What does one do? It was noted during the prior hearings on July 24 and 25, that the vendor in that application, Sequoia, did have a mechanism to conspicuously stamp spoiled ballots as "VOIDED" and accepted, i.e. cast, ballots as "ACCEPTED". The Title 19 Committee concurs

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with NJIT's exception number 5 that "there is no clear acceptance information (e.g. "VOIDED" or "ACCEPTED") and that such information needs to be printed on the paper ballots.

5. The VVPRS needs to be equipped with an appropriate warning system to notify election officials at the polling place when there is a mechanical error or malfunction, and the DRE needs to suspend voting operations at the time.

NJIT's exception number 6 reads as follows: "If a mechanical error or malfunction occurs (such as a paper jam, running out of paper, paper torn in half, or paper inserted improperly), the DRE displays an error message on the screen to the voter, but no warning signals are sent to notify the election officials at the polling place. The DRE does not suspend voting operations. The voter has the opportunity to continue voting and cast the vote but the paper record is not printed. The vote is, however, electronically recorded."

The vendor indicated that the problem outlined above would be fixed with the next edition of its software. This correction needs to be exhibited to the satisfaction of the Attorney General's office and/or NJIT.

6. The printer needs to be connected to the voting machine in a fashion such that the connections are substantially concealed or could make use of a security tag to prevent tampering.

NJIT's exception number 7 reads as follows: "The printer connection between the printer and a particular voting machine is not completely concealed to prevent tampering. Furthermore, the exposed part of the connection between the VVPRS and the voting machine is covered with plastic wrap, but not completely, allowing access to the cable."

During the course of the demonstration, Mitchell Darer of NJIT demonstrated how it was possible, with one machine, to manually reach in and disconnect the printer connection to the DRE. Also some cables were exposed. The vendor indicated that they would add a strain relief device to the end of the printer cable thereby making it virtually impossible for an individual to remove the printer cable from the DRE. In addition the Title 19 Committee was shown cables that were bound in a way that appeared relatively secure. This might be an acceptable fix with regard to the exception above.

7. If a paper jam or low paper supply occurs, the machine only provides one type of error message and it is the position of the Title 19 Committee that additional error messages are needed to better differentiate between the types of errors that typically occur.

NJIT's exception number 8 reads as follows: "Although the DRE can detect problems that may prevent paper records from being correctly displayed, printed, or stored (like paper jams or low paper), no warning signals are sent to notify the election officials at the polling place."

The vendor indicated that they only had two error messages now but will provide a significantly larger number of differentiable and relevant error messages along with an audible alarm in the next round of software enhancements.

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8. The DRE needs to display an error message on the screen and to provide a warning signal to election officials, and suspend voting operations if there is a disconnect between the voting machine and the printer.

NJIT's exception number 9 reads as follows: "If the connection between the voting machines and the printer breaks during the voting process, the DRE displays an error message on the screen to the voter, but no warning signals are sent to notify the election officials at the polling place. The DRE does not suspend voting operations. The voter has the opportunity to continue voting and cast the vote without printing any paper record. The vote is, however, electronically recorded."

The vendor recognized the foregoing problem and indicated that it would be corrected with the next round of software enhancements.

Avante's letter dated July 27, 2007 to Karen DuMars from Greg Beasley indicated with regard to State Criteria "V.D." that:

"Avante does not use cryptographic software in our voting system"

It was the Title 19 Committee's impression during the hearing that the Avante VVPRS machines included some form of protection for its data. It seemed to the Committee that the ability to encrypt data would be an important feature of any VVPRS. A careful reading of section V.D., however, does not make it clear if some form of data protection is required. The Committee, accordingly, does not take a position on the issue but encourages the Attorney General's Office to use its own judgment about whether or not some form of cryptographic capability is required, and if so, the Avante Vote-Trakker should be required to have it too.

In conclusion, the Committee found, as did NJIT, that the Avante Vote-Trakker VVPRS satisfactorily meets the two (2) core requirements for a voting machine, namely, that the paper trail and the electronic votes matched 100% and that the four (4) independent systems were synchronized and matched also. It was clear, however, that the vendor needed to address and correct the issues identified above before the machine should be accepted for use by the State of New Jersey.

In view of the foregoing the Committee does not recommend the use of the Avante Vote-Trakker VVPRS in its present state, but would agree that the machine could be acceptable for use if the items noted above were corrected. The preference would be for the vendor to make the corrections and resubmit the equipment to NJIT so that NJIT can determine if those specific eight (8) items had been corrected. A full review by NJIT would probably not be necessary. If that is not feasible, then the Attorney General's Office, in its discretion, might choose to make those determinations for itself.

The Title 19 Committee is always available to assist to the extent that the Attorney General's Office deems it appropriate or necessary.

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There were a few items in the NJIT report that the Title 19 Committee reviewed but determined were not significant problems.

First, NJIT exception number 1 indicated that "Paper replacement is expected after 600 votes." The vendor represented that the roll of paper employed on the Avante Vote-Trakker VVPRS has a length of 800 feet. While it might be ideal for a voting machine to cast 750 votes without changing a reel, the Title 19 Committee did not believe that it was mandatory that 750 votes be required for a spool change. The Committee is already on record with another vendor as indicating that at least 500 votes before a roll change would be satisfactory and, accordingly, the Title 19 Committee respectfully disagrees with exception number 1 of the NJIT report.

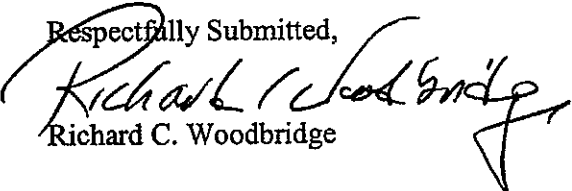
Second, the Title 19 Committee noted Exception No. 10 with regard to "fleeing voters" by NJIT. Fleeing voters is a universal problem but not one that appears to be addressed in the State Criteria or in previous statutes. Also, it is not clear how a "fleeing voter" would detrimentally hurt the final results of an election.

Lastly, an issue was raised as to whether or not the entire system, including the Avante Vote-Trakker DRE itself, should be completely re-examined. The Committee considered this and decided against a complete review for the following reasons:

1. First of all, the standards under old Title 19:48 and 19:53 are outdated given that they are approximately 40 years old and directed towards mechanical machines or optical/mechanical ballot readers. A review under the old statute wouldn't be especially productive given the nature of new DREs.
2. Most of the important, relevant sections of Title 19:48 and 19:53 have been incorporated into the new State Criteria.
3. Title 19 indicates that a new review is not necessary unless the improvement impairs the operation of the DRE and there does not appear to be any impairment in the case here.

A list of documents presented to the Title 19 Committee either during the hearings or in writing before the 5:00 p.m. Friday, July 27, 2007 deadline is attached hereto as Attachment "A".

Respectfully Submitted,

  
Richard C. Woodbridge

Daryl Mahoney

John Fleming

RCW/lis

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**TITLE 19 COMMITTEE REPORT**

**ATTACHMENT A**

**LIST OF DOCUMENTS PERTAINING TO THE  
AVANTE VOTE TRAKKER**

## Avante Vote Trakker

- Ciber Software Qualification Test Report Avante International Technology, Inc. Vote-Trakker 4.4.3, version 1.0 (7/26/02)
- Ciber Software Qualification Test Report Avante International Technology, Inc Vote-Trakker 4.7.5/Optical Vote-Trakker 1.5.0 Created 02/23/04 Updated 5/12/04; Addendum 1 for Vote-Trakker 4.7.6/Optical Vote Trakker 1.5.0 Created 6/11/04, version 1.1 (5/12/04)
- Ciber Qualification Test Report Avante International Technology, Inc., Vote-Trakker 1.2.0, version 1.0 (2/27/06)
- Ciber Qualification Test Report Avante International Technology, Inc., Vote-Trakker 1.2.0, version 1.2 (4/10/06)
- Wyle Report No. 46016-01, Revision A (8/16/02)  
Qualification Testing of the AI Technology Vote-Trakker DRE Voting Machine (Model EVC308, Firmware Release 4.4.3)
- Wyle Report No. 48453-01 (6/4/04)  
Change Release Report of the AI Technology Vote-Trakker EVC-308SPR DRE (Firmware Release 4.7.6)
- Wyle Report No. 52667-03 (2/9/06)  
Inspection, Test and Evaluation of the Vote-Trakker Model EVC308-FF
- Wyle Report No. 52667-01 (2/27/06)  
PRELIMINARY Hardware Qualification Testing of the Avante International (AI) Technology, Inc. Vote-Trakker EVC308-FF DRE Voting Machine (Firmware Release 1.2.0).
- Wyle Report No. 52667-01 (4/10/06)  
Hardware Qualification Testing of the Avante International (AI) Technology, Inc. Vote-Trakker EVC 308-FF DRE Voting Machine (Firmware Release 1.2.0)
- Ciber Letter, Full Face Vote Trakker Version 1.2.2 (2/16/07)
- Ciber Memo, Optical Vote Trakker 1.7.1 and Full Face Vote Trakker 1.2.1 (10/31/06)
- Report to the Office of the Attorney General: Avante Vote-Trakker Voter-verified Paper Record System Assessment, prepared by New Jersey Institute of Technology, Center for

Information Age Technology, July 2007

- Spreadsheet with Comments by Avante on the Exception Reports (July 23, 2007)
- Memo dated July 27, 2007, from Greg Beasley Re: Avante Information, including responses to information and clarification requested by the Committee

The following were provided by Avante in response to their compliance with NJ VVPRS Criteria:

- New Jersey Criteria for Voter-Verified Paper Record for DRE Documentation (5/2/07)
- Correspondence from Kevin Chung, Ph.D., dated July 20, 2007, certifying that the Avante VVPRS satisfies the New Jersey Criteria for the Voter-Verified Paper Record System
- Ballot Preparation Manual, Version 5.2.9 Rev. B (1/25/06)
- Polling Official's Manual, Version 1.2.0 (1/25/06)
- Maintenance and Repair Manual, Version 1.2.0 (1/25/06)
- Tally and Reporting Manual, Version 5.2.9 Rev.A (12/28/05)
- Technician's Manual, Version 5.01 (9/15/06)
- Wyle Test Report No. 52667-01, Page 8 & 9
- Three sample paper records from 2004
- Voter handouts explaining the VVPAT used in Warren County

#### **Documents Provided As Public Comments**

Binder containing 67 exhibits presented during testimony of Flavio Kumoves, Esq., Deputy Public Advocate. Exhibit 59 was inadvertently omitted but Mr. Kumoves has provided us a copy on July 30, 2007 which is included in the hard copy documents being forwarded via overnight mail. In addition, we are forwarding via overnight mail the additional documents provided by Mr. Kumoves on July 27, 2007, which were already transmitted electronically to you

Written Testimony and Submissions of Penny M. Venetis, Esq., to the New Jersey Voting Machine Certification Committee, July 27, 2007: 40 page submission with attached Exhibits A-O

Written comments from BlueWaveNJ Electoral Reform Committee submitted by Ann Rea And Richard Insley, co-chairs, Electoral Reform Committee

Written comments from Alan Goldsmith transmitted electronically on July 27, 2007

#### **Hearing Transcripts**

from 7/24/07 and 7/25/07 hearings have been provided

from 7/26/07 hearing: enclosed in package we are forwarding via overnight mail on July 30, 2007