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APPEARANCES

PANEL MEMBERS

Ms. Debbie O'Donoghue, Moderator, Deputy Secretary, Voter Education & Outreach Services

Mr. Robbie Anderson, Staff Counsel, Election's Division

Mr. Chris Maio, Infrastructure Manager

Mr. Bruce McDannold, Senior Information Systems Analyst

Mr. Chris Reynolds, Deputy Secretary, HAVA Activities

STAFF

Mr. Ryan Macias, Voting Systems Analyst

ALSO PRESENT

Mr. John Arntz, City and County of San Francisco

Mr. Paul Craft, Freeman, Craft, McGregor Group

Mr. Chuck O'Neil, Californians for Electoral Reform

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PROCEEDINGS

MODERATOR O'DONOGHUE: Okay. We'll go ahead and get started. Everybody can hear me okay?

Great.

Well, thank you for coming. My name is Debbie O'Donoghue. I'm a Deputy Secretary of State for Voter Education and Outreach Services, and I'll be moderating the proceedings today.

This public hearing is designed to discuss the proposed approval of Sequoia Voting Systems System 4.0 with Ranked Choice Voting capability.

Let me take a moment and take care of some housekeeping items. For those of you in the audience who would like to speak during the public comment period, there are sign-in cards at the table at the entrance of the auditorium. We'll take speakers in the order in which they have signed in. Each person speaking under public comment will be allotted 3 minutes for our presentation. Anyone who wishes to submit written testimony can do so by delivering a hard copy today or by Emailing an electronic copy to votingsystems@sos.ca.gov. We'll post the written testimony we receive on the Secretary of State's website.

This hearing is being taped for broadcast and is also being transcribed. All comments made verbally or in writing as part of this hearing are a matter of public

record.

Please be courteous to all speakers. No interruptions will be tolerated.

The goals of this hearing are to:

Hear the Sequoia Voting System testing reports presented publicly; give Sequoia and the public an opportunity to comment publicly on the reports; and collect information from Sequoia and the public that may help inform the Secretary of State's decision on whether to approve the Sequoia Voting System 4.0 voting system. The Secretary of State will be reviewing the information and testimony provided by the public, the county, the vendor and others prior to taking action on this approval request.

The panel that's here today won't be voting or deciding whether to adopt the report nor will they be commenting on the report's findings or expressing opinions on what the Secretary of State may do or should do as a result of the findings in this report.

Rather, the panel is here to formally receive the verbal report from the State's outside consultants, receive comments from the voting system vendor and the public and bring a variety of perspectives to the issues raised in the reports, so that the panel may present that to the Secretary when it comes time for her to review and

analyze all of the information that's being collected.

The panel members here today, seated to my immediate right are Bruce McDannold, Senior Information Systems Analyst; Chris Maio, Infrastructure Manager for the Secretary of State's Information Technology Division, Chris Reynolds, Deputy Secretary of State for HAVA Activities; and Robbie Anderson, counsel for the Secretary of State's Elections Division.

Delivering the staff report will be Ryan Macias of the Office of Voting Systems Technology Assessment and delivering the State consultant reports will be Paul Craft of Freeman, Craft, McGregor Group.

After the reports are presented, Sequoia will have an opportunity to provide comments and we will then move on to the public comment period.

And with that I'd like to introduce Ryan Macias.

VOTING SYSTEMS ANALYST MACIAS: Good afternoon. My name is Ryan Macias. I am a Voting Systems Analyst with the Secretary of State's Office of Voting Systems Technology Assessment, also known as OVSTA. I will be presenting the staff report to you today.

Let me begin with a summary of the Sequoia Voting System's System 4.0 with Ranked Choice Voting capability, also referred to as RCV. RCV is a ballot structure for single-winner contests, used in several electoral systems

in which voters rank a list of candidates in order of preference.

Sequoia's System 4.0 voting system is comprised of the following 6 components:

WinEDS version 4.0.116;

WinEDS Extended Services version 1.0.47;

WinEDS Election Reporting version 4.0.44;

The Optech Insight Plus with HPX version K1.44.080501.1500, and APX version K2.16.080626.1320;

Memory Pack Reader, also known as MPR, version 3.01.080422.0522;

The 400-C Central Scanner with WinETP 1.16.6.

WinEDS is a software application used for managing an election. It is used to define and configure an election, format ballot layouts, programming memory cartridges, tallying and reporting election results and performing post-election operations.

WinEDS Extended Services provides additional functions to the WinEDS application. During the State of California testing OVSTA staff and consultants configured the system with 2 snap-in modules, Database Manager and Ranked Choice Voting.

Database Manager enables the jurisdictions to perform several administrative tasks, such as profile and election database backups, profile and election database

restoration and profile database copying. The RCV module, within WinEDS extended services, creates an interface to manage the RCV process and deliver reporting capabilities.

WinEDS Election Reporting is an independent application to manage reports and flat file exports that are not available directly through WinEDS. It allows jurisdictions to produce reports while running the election night tally.

The Optech Insight Plus also referred to as just the Insight, is a precinct based optical scan voting system used to cast and tabulate ballots in the polling place. There are 2 systems residing in and controlling the functions of the Insight. The Hardware Program System or HPX and the Application Program System or APX.

The HPX and APX form a complete self-contained closed application. The HPX system performs a validity check on the hardware and verifies that a ballot is not present in the ballot path. The APX verifies the vote totals.

Memory Pack Reader is a desktop device that burns ballot definition data for a specific election onto, and transfers election results from the Insight Memory Packs into WinEDS database.

The 400-C is a high-speed, high-volume scanner typically used for tabulating vote-by-mail ballots. In an

RCV election the 400-C is used to resolve write-ins. If a voter votes for a write-in candidate in an RCV race, the Insight out-stacks the particular ballot and does not tabulate any of the votes on that ballot.

During the canvass, the jurisdiction using the system tabulates the ballot containing the write-in with the 400-C and manually resolves the write-in candidates.

Sequoia Voting Systems System 4.0 has not completed federal qualification testing to the Federal 2002 Voting System Standards. This system is currently in the Election Assistance Commission, also known as EAC, Voting Systems Certification Program.

However, OVSTA staff has received a letter from iBeta Quality Assurance, an EAC accredited voting systems testing laboratory, stating that it has successfully completed the functional testing of the Sequoia Voting System WinEDS version 4.0 with WinETP and San Francisco RCV. Under California law Elections Code Section 19250(a), the Secretary of State of California shall not approve a direct recording electronic (DRE) voting system unless the system has received federal qualification. The Sequoia System 4.0 does not include a DRE. Therefore, federal qualification is not required prior to State approval. In addition, the Sequoia System 4.0 does not include an accessible device for voters with disabilities.

If the Secretary of State approves the Sequoia System 4.0, a jurisdiction approved to use System 4.0 would need to request authorization to use a blended system that incorporates a previously approved accessible voting device under California Elections Code 19213.

Before I begin with the results of the State testing, let me first begin by saying that this examination did not include the following components:

Volume test, red team penetration testing, building the election definition, and conducting a State primary election.

This was a conscious decision made by our office due to the fact that all hardware components of the system just concluded the top-to-bottom review. In addition, due to time constraints, it would have been impossible or nearly impossible to have OVSTA and consultants spend one week building the election definition and then have the vendor print and mark ballots to those specifications for the functional test.

Only the standard State general test election definition was used in this test. Prior to use in a primary election, OVSTA and consultants will need to test 2 specifications and requirements for a primary election set forth in California Elections Code.

State examination and functional testing of the

system was conducted by Secretary of State's OVSTA staff in conjunction with State's technical consultants, Mr. Paul Craft and Ms. Kathleen McGregor, at the Secretary of State's Office, 1500 11th Street, Sacramento, California, from August 18th through August 22nd, 2008.

Testing of the Sequoia System 4.0 was completed successfully. During that testing, OVSTA staff and consultants built the entire voting system beginning with only the hardware, utilizing Sequoia's documentation and specifications as we do in all functional tests. Prior to running ballots, the last task performed in the system was the burning and configuring of the media for Insight and 400-C. Sufficient ballots were processed for the standard State general test election contest to verify features of the system, as well as to test the system's capability to conduct elections in accordance with California law.

In addition to the standard State general test election, we tested the logic and capability to conduct an RCV election according to the specifications set forth in the San Francisco City Charter.

I'm not going to go into each and every finding that was noted in testing, but they are listed in the full staff and consultant's reports on the Secretary of State's website. However, I will let you know that all issues noted in testing have been resolved in either the use

procedures and/or a work-around has been tested, verified and approved.

Secretary of State hired Freeman, Craft, McGregor Group for security testing. They subcontracted with Atsec Information Security Corps to perform a source code review on Sequoia's System 4.0. Atsec compared the source code for System 4.0 to the code that was tested in the top-to-bottom review WinEDS 3.1.012 to determine if the issues in the prior version have been resolved.

System 4.0 has 2 new modules, WinEDS Extended Services and WinEDS Election Reporting that were not previously reviewed. Atsec conducted a thorough review of the code for these 2 new modules.

In addition, Atsec was asked to verify that the issue discovered in Washington State's testing of an earlier version of the Sequoia RCV system has been resolved in the version tested by California. Because Paul Craft from Freeman, Craft, McGregor is here, I will let him go into the details and findings from the Atsec report.

Therefore, based on the testing conducted and the review of Sequoia Voting Systems System 4.0 with RCV capability, as described above, OVSTA recommends that the Secretary of State approve the system with the 30 conditions outlined in the full staff report viewable on

the Secretary of State's website at www.sos.ca.gov. These conditions are similar to the conditions placed on the already approved Sequoia Voting System that went through the top-to-bottom review WinEDS 3.1.012.

Because Sequoia has not substantially improved security from that system to this system, OVSTA recommends that the Secretary of State impose similar conditions.

Thank you.

MODERATOR O'DONOGHUE: Thank you. Are there any questions from the panel?

Thank you.

VOTING SYSTEMS ANALYST MACIAS: Thank you.

MODERATOR O'DONOGHUE: Now, I'd like to introduce Paul Craft.

MR. CRAFT: Good afternoon. And let me get this a little higher.

There. Can you hear me?

I'm Paul Craft one of the partners in the Freeman, Craft, McGregor Group.

As Mr. Macias stated, we assisted the Office of Voting System Technology Assessment in the functional testing and security analysis of Sequoia Voting Systems --

MODERATOR O'DONOGHUE: Sorry, you might want to bring it a little bit closer.

MR. CRAFT: Okay -- in the functional testing and

security analysis of the Sequoia Voting System System 4.0.

Our functional testing report and the source code review report prepared by Atsec have been carefully written to accurately present our findings. I'm here to introduce the report and answer any questions about them.

I really don't presume to expand on the reports or restate any of the findings. And accordingly, if you perceive a conflict between any of my statements today and the actual content of the reports, I think you should give preference to the content of the reports.

In our report on functional testing of the system, there are really 4 significant findings. First of these is that the system successfully processed and tabulated all of the test ballots, including the ranked choice contest with no tabulation errors. All tabulated totals matched the expected results for the test. The test election did everything that we could to approximate the complexity of an election similar to what San Francisco will most likely run in November.

It also included 12 different test cases for the ranked choice voting, exercising conditions of ties, multiple ties and other conditions which you might expect to logically trip up the ranked choice algorithm. As I said, the system tabulated all those ballots as expected with 0 errors.

In regards to the anomaly tested or discovered during testing in Washington State earlier this year, this was an anomaly where ballot images were not erased from the memory pack and the system gave a false 0 report when it restarted for the next cycle and could bring those ballot images into a subsequent tabulation.

That issue appears to have been mitigated in this version of the system. We verified that both through our functional testing and through the Atsec source code review.

For functional testing, we actually replicated the anomaly that had been experienced in Washington State using the same version of the firmware that they used when they encountered the error. We then attempted to bring the data from that memory pack into the current version of WinEDS. WinEDS has an edit check on the data, which detected the fact that there were a different number of ballot images from the tabulated totals on the memory pack and rejected the pack.

Secondly, we then attempted to replicate the error with a new version of the firmware and were unable to do so. One of the findings in the Atsec report is they found changes in the source code of the Insight device that basically verified that the totals had been cleared and the operation had been successful. So that verified

that fix, both in functional level and in the source code review.

We then found 2 additional unexpected errors. We encountered an unmanaged error condition, which ended the process of the extended services part of EDS. And what this turned out to be was a security wrapper, basically an encryption algorithm designed to protect the executables on the system from alteration or being copied or modified.

And that operation takes a little time to close out one application and open another. We were coming out of WinEDS, going into extended services very quickly. And when we did so, we would occasionally encounter this error. The error is fairly benign. It basically booted you out of the process and when you restarted the application it would load normally.

The other unexpected error was in the database manager snap-in on extended services. We found that we were unable to change the directory paths for data files back-up files and logs from within the application. Sequoia demonstrated a work-around where you could go into a configuration file and actually hard code those changes and paths in the configuration file.

That is pretty much it for functional testing issues.

In the Atsec report on source code review of the

system there are numerous findings. The time available of this hearing doesn't really allow reading of them. And as I said earlier, their report speaks very well for itself.

Atsec found that the security posture of the system was largely unchanged since the top-to-bottom review of 2007. Although, there had been significant improvements in the system security in different areas, there are still some significant errors present in software and design of the hardware.

I think everyone understands the concept of the weakest link in a chain is the strength of the chain. Sequoia and its Insight device and its 400-C has hardware there that has not changed since the top-to-bottom review. And despite some improvements in areas such as not sending passwords over the network in clear text and using a newer version SQL Server, the overall security exposure of the system is still fairly weak.

One new piece that they did a very nice job on is a new module and they're now using the AES encryption. And Atsec did a validation against NIST standards for that module and found that they had correctly implemented the AES encryption in the system. There are still other encryption and validation pieces that are not really correct in other parts of the system.

With regard to the main charges that Atsec had in

their contract with us and the Secretary, I would like to go through their conclusions from page 32 of their report. And this I think speaks well to the overall opinion.

With regard to determining whether the provided source code resolves specific security defects identified in the UC Berkeley report, the reviewers could verify that 9 of the 47 previously recorded defects had been sufficiently resolved in the provided source code to mitigate the vulnerabilities. Code modifications for 2 defects partially resolved the reported issues. Code modifications for 2 defects do not sufficiently mitigate the vulnerabilities they were intended to resolve. And resolution of some 10 issues could not be determined simply based on the review of the source code, but will need to be verified at some point by functional testing and penetration testing or other means.

Based on the code review, the reviewer found that approximately 24 of the 47 issues really have not been addressed by code modifications.

With regard to determining whether the provided source code resolved specific defects identified in the State of Washington testing, the reviewer found that a new mechanism that verifies successful completion of the initialized or 0 operation should prevent occurrence of the previously identified error.

With regard to the 2 new modules, WinEDS Extended Services and WinEDS Election Reporting, the reviewers found that the modules are susceptible to SQL injection attacks, via both the graphical user interface and malicious input files. It relies on user action to ensure data integrity rather than implementing a system safeguard. And it provides inadequate error handling. Exploitation of these weaknesses could result in data corruption and/or incomplete or false results.

With regard to evaluating the extent to which the system protects the integrity of ballot data and ballot images, this was a concern, because one of the new things that you have in ranked choice voting is these devices now have to store ballot images and run those ballot images through the ranked choice algorithm. So that was a new feature and a new area of concern.

The reviewers found that except for a simple redundancy check, there is no security on the data in the memory pack, program code or data, that could easily be manipulated by an attacker.

Overall the reviewers found that while progress has been made, the integrity of the election definitions and ballot information is not properly protected. Many attack scenarios center around the interception and modification of data. And there are simply no reliable

ways to detect those kinds of attacks.

And that is about it.

MODERATOR O'DONOGHUE: Thank you. Are there any questions from the panel?

Thank you very much.

Now, Sequoia will have an opportunity to provide any comments it would like to make on the reports. We have here today Mr. Ed Smith Vice President, Compliance, Quality and Certification. We've allotted 30 minutes for your presentation. You may begin.

MR. SMITH: Thank you very much. My comments won't take 30 minutes, unless I speak very, very slowly. Well, good afternoon to the panel and thank you for allowing us to come out here and provide a few remarks.

Before I start into some of the details, you know, we've all seen around the work place and whatnot the acronym for the word "Team", T-E-A-M, Together Everyone Achieves More. Clearly, this is a situation that we've seen with the certification group, OVSTA, the State's consultants and Sequoia.

You know to me this is really out here with the State of California a model regulatory relationship where the group here, you know, is tough. And it's tough all the way from the grammar in the sentences of your documentation -- and Ryan is smiling, so it must be the

truth -- out to the least little hiccup in your functional process and the process of running the mock elections through to the end through the testing. And it's a very tough process and certainly a nation-leading process.

But the nice thing about it is, and one of the real strengths of the process that the Secretary has put into place out here, is that you were able and are able through the certification process, and assuming the Secretary grants certification, to take care of a local statutory need. And we don't see that sort of regulatory flexibility in every other state. So once again, trusting my argument that the State of California has a nation-leading process.

Mr. Craft gave some remarks regarding the source code. And we are a bit disappointed in the source code, not only that it showed that we did not close up all of the gaps, but frankly with the process that's in place at a point where I believe the process could be improved, has to do with that source code review. One aspect of it is that we were on a somewhat limited time basis. And as a point of direct improvement to the process for performing these reviews with Atsec, there was no communication between Atsec and Sequoia's technical people. There were some requests for information that Sequoia satisfied.

But upon reading the report, our WinEDS

development team immediately came back with a handful of instances where basically we rebutted portions of the report. And as we go for the complete certification with DRE, after our federal qualification, we'd certainly like to continue to work with the State and with the State's consultants on that process. One thing that will work in everyone's favor is, I suspect at that time, Atsec will have additional time to review the code.

You know, with WinEDS itself even without these 2 modules, you're talking 1.1 million lines of code. And it's very difficult to review that in the limited time that we had. But I think they did a nice job. The fact is there are such significant changes between 3.1012, currently certified in the State of California, and 4.0 that is up for certification, that it's easy to miss where these new security mechanisms have been put into play. And so that's a point where I think we can improve the process.

That being said, we're honored to receive the staff recommendation for certification. Once again, we appreciate the panel's time and the Secretary's and our customers' time today to come out to this hearing. And we look forward to coming back to you once we've received full federal qualification with a full system.

Thank you.

MODERATOR O'DONOGHUE: Thank you. Are there any questions from the panel?

Thank you very much.

Now, we'll move on to the public comment portion of the hearing. And as I mentioned earlier, if you wish to speak during this period, you need to fill out a comment card. Right, as it stands right now, I have one comment card. And Ryan's going to check to see if we have any others.

The first person we have is Chuck O'Neil from Californians for Electoral Reform. And you'll have 3 minutes.

MR. O'NEIL: Thank you. I'm Chuck O'Neil. I'm a board member of Californians for Electoral Reform. I'm their financial VP as well. Several of our more technical members have reviewed the documents that were available on-line, including Steve Chessin, Dave Kadlecek and Steven Hill. And with conversations with them, they think that this system ought to be certified and so we're asking that it be certified statewide.

I'd like to say that the terminology is getting confused in most scholarly works. What San Francisco is calling choice voting would be considered instant runoff voting or IRV. And quite often people use the term "choice voting" or "ranked choice voting" to mean a

proportional representation system technically known as single transfer of a vote, so I might slip into those terms. When we're talking about San Francisco's terminology, we're really talking about an IRV system.

There are several counties who are waiting to use IRV. They have adopted their charters or elected ordinances subject to certifiable technical equipment. The 2 counties that have done this -- or the cities that are in the 2 counties that have done this are Santa Clara and Alameda County. They both currently use Sequoia systems. And so we would hope that the certification would allow them to move into that kind of voting.

There are other cities and counties in California who are in the process of either adopting IRV or an STV system. IRV includes Los Angeles, Long Beach, San Diego. I think there's some others. In Davis, where I'm more familiar with, the citizens voted by 55 percent an advisory measure asking that the council adopt or consider adopting what they're calling choice voting, which is an STV system.

So one last question, if I could. Some of the documentation talks about Sequoia reports or procedures. And we would like to get copies of those if that's possible.

MODERATOR O'DONOGHUE: The reports?

MR. O'NEIL: Yeah.

MODERATOR O'DONOGHUE: I believe they're on --

MR. O'NEIL: The Sequoia ones. They're not on the website.

MODERATOR O'DONOGHUE: Thank you for the request.

MR. O'NEIL: Okay. So we encourage you to certify the system.

MODERATOR O'DONOGHUE: Thank you.

MR. ARNTZ: Good afternoon. My name is John Arntz. I haven't filled out a card yet. I will do that before I leave. I'm the director of elections in San Francisco. And I just have a few comments and I can take any questions from the panel that you might have.

First of all, I just wanted to note again in the public record that these certification processes don't happen in a vacuum. I think that the Secretary of State's Office was incredibly flexible and accommodating to San Francisco, first of all, and next to the vendor. And, you know, here we are in September when this hearing is taking place. But a lot of activity and a lot of thought and a lot of concern actually went in to this process and the testing of the system. And I think that needs to be noted.

And on behalf of San Francisco, you know, we very much appreciate, again for the 4th year, that the

Secretary of State's Office has stepped forward to assist the County to hold ranked choice voting elections for the November election -- for the November contest.

Second, the point that I want to make is that in both the source code review and also in the Secretary of State's staff report, it mentions that there needs to be limits on personnel access to the system to reduce the -- to increase the integrity -- and the insurance of the integrity of the data.

Both Sequoia and the Department in San Francisco will work to ensure that access is limited to the system as we move forward, so that the hardware and operational protections that the State has put forward previously for the system will be combined with personnel and accessibility protections as well.

So that's pretty much all that I want to say here in the time that I have. I can take any questions that the panel might have. And, again, I just want to thank the Secretary of State's Office and the people involved in this process, because for the 4th year in a row we've had to be at this point. And again the State has stepped forward to be, I think, most accommodating.

MODERATOR O'DONOGHUE: Thank you.

Okay. We've now completed our agenda. And I'd like to thank our panelists and our presenters here today,

as well as the people in the audience. And as I mentioned earlier, anybody who wishes to submit written testimony can do so today, can deliver a hard copy to the Secretary of State's Office or send an electronic version to votingsystems@sos.ca.gov.

The meeting is adjourned.

(Thereupon the Secretary of State's public hearing adjourned at 1:37 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, and Registered Professional Reporter, do hereby certify:

That I am a disinterested person herein; that the foregoing Secretary of State's public hearing was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said hearing nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 29th day of September, 2008.

JAMES F. PETERS, CSR, RPR
Certified Shorthand Reporter
License No. 10063