United States Election Assistance Commission

Public Meeting

Voting Systems Manufacturer Roundtable Discussion

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VERBATIM TRANSCRIPT

EAC Roundtable Participants List

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VOTING SYSTEMS MANUFACTURERS ROUNDTABLE DISCUSSION

DR. KING:

Welcome and good morning everyone. My name is Merle King and I've been asked to moderate the panel this morning.

The first order of business always at these meetings is, if you would find the cell phones and the PDAs and put them on mute if you would. We definitely would appreciate that. Another important aspect we are recording the conversation today and if -- I talked with the transcriptionist earlier and he reminded me how important it is that we speak one at a time and clearly, so you can help in that regard. And then finally to help identify everybody here if you could put your name plate facing outward, it will help everybody identify each, other in case we don't know each other yet.

So I'd like to welcome you to this roundtable discussion. This is the second in a series. Today's roundtable focuses on the issues and the concerns of the vendors regarding the draft 2007 VVSG. And what we hope to do in today's conversation is to eliminate how the standard, the proposed standard will impact your business and ultimately how it will impact your customers. And so at the conclusion of today's meeting what we hope from the EAC's perspective and from the other participants is to have a greater understanding of just how this 2007 draft could unfold, and then more importantly perhaps how it could be improved between now and its final adoption, keeping in mind that we can never compromise the goals of our systems, which is accuracy, security,

accessibility and affordability. Affordability not only from the vendors' perspective of development but more importantly from the jurisdictions' perspective of purchasing the systems.

So what I'd like to do this morning is to ask each of you to briefly introduce yourself, who you are, the organizations you're representing, your role within that organization. And I'm going to start with Brian and then we'll work our way around the table.

MR. HANCOCK:

Thank you, Merle. Brian Hancock, Director of Testing and Certification with the U.S. Election Assistance Commission.

MR. HIRSCH:

Bernie Hirsch, MicroVote General in Indianapolis. I'm the Director of Software Development.

MR. HOLSMTROM:

I'm Larry Holmstrom, Truevote. I'm the CEO and CTO.

MR. CARBULLIDO:

Good morning, I'm Ken Carbullido, Senior Vice President of Systems at Election Systems and Software, which means managing and building all hardware, software, firmware, quality assurance, certification. All the gamut of delivering systems.

MR. BEASLEY:

Good morning, my name is Greg Beasley. I'm with AVANTE International. I'm the project manager responsible for product development, certifications and support of electronic -- of the voting systems that is.

DR. KING:

Thank you, Greg.

MR. SMITH:

> Good morning, my name is Ed Smith. I'm with Sequoia Voting Systems where I'm Vice President of Legal Compliance, Quality Assurance and Certification.

MR. IREDALE:

> Tab Iredale with Premier Elections. I'm Director of Product Development.

MR. KAPSIS:

> Jim Kapsis, Precise Voting. I'm the managing partner.

MR. ROGERS:

> I'm Andy Rogers, Director of Product Development for Elections for Hart Intercivic.

MR. HOOVER:

> James Hoover from Dominion Voting Systems. I'm the Vice President of Certification.

MR. SKALL:

> I'm Mark Skall, Chief of the Software Testing Division within NIST, National Institute of Standards and Technology. And one of the things we do at NIST is to try to work with industry and government to advance the IT world by helping develop standards and specifications. And, of course, one of our key roles is in voting, which I oversee.

DR. KING:

> Thank you, Mark. And I'm Merle King. I'm Associate Professor of Information Systems at Kennesaw State University and Executive Director of the Center for Election Systems in the State of Georgia.

Again thank you all for coming today. Brian I'm going to ask if you would give a welcome from the EAC and make your opening remarks.

MR. HANCOCK:

Thank you, Merle. Yes, on behalf of the four Commissioners here at the EAC and our Executive Director Tom Wilkey I do want to welcome you here this morning. We appreciate you taking time out of your busy schedules. We know we're getting late into an election year and you all have more than your share of work to do, but we think this is an important undertaking and we appreciate you being here today to give input on these important topics.

As Merle noted, this is the second in the series of roundtable discussions on the TGDC draft voluntary voting system guidelines. We had our first roundtable in Austin, Texas, last December and I think we were very encouraged by the participation and discussion we had with the academic community. And we are going to have five additional roundtables after this meeting today. On March 19th in Denver, Colorado, we will have a roundtable with the voting system test laboratories. On March 27th here in Washington, D.C. we will have a roundtable with the accessibility and usability community, and that will take place on the campus of Gallaudet University just ten or 15 blocks from this office. On April 24th we will have a roundtable meeting with election officials from around the country. That will be here in this room. On April 25th, the very next day, we will have another roundtable discussion with members of the advocacy community, again here in this room. Finally, the EAC will have what we're terming an interdisciplinary roundtable

meeting, again here in our offices, and that will be on May 5th. And what we'll have there is essentially members from all of the roundtables that we've had, as well as some selected other folks that have an interest in this area.

In order to accommodate all of these discussions and all of these meetings and to receive public comment on the discussions we're going to have, the EAC has extended the current public comment period for an additional 60 days. This should be noticed in the Federal Register next week, and it will be on the EAC's Web site today. This would make the new timeframe to have all public comments due on or about May 5th, 2008.

Also, these roundtable discussions certainly wouldn't be possible without great folks doing the real work here, and so I'd be remiss if I didn't acknowledge Matt Masterson over here who did the work for putting this thing today. So Matt appreciate it.

Before I kick sort of the discussion off and give it back to the capable hands of our moderator Merle King I'd just like to reiterate my statement that I put out in Austin as to the purpose for holding these roundtables. We, of course, want input on the draft VVSG. That's without question. But these comments are essentially only a means to our end goal of developing and implementing the most robust set of standards possible in order to make voting systems more secure, more reliable, more accurate, and more accessible. These are rather simple sort of baseball and apple pie concepts when you speak of them but this group, as you know very well, knows that it's extremely difficult to put these into practice. By undertaking the development and adoption of the new iteration of

the VVSG the Election Assistance Commission and its partners are charting a course for the development of voting systems for the foreseeable future. This is a truly awesome responsibility and one which we're undertaking with full commitment and proper due diligence. Given the scrutiny that our electoral process is under today, failure in this endeavor is certainly not an option for us. This is why we've invited you here today and why we'll be holding the other roundtable discussions that I just mentioned a moment ago.

The excellent work of NIST and the TGDC in putting this document together is only the beginning of the process of development, review and adoption. The real work for the EAC, for our partners in this effort and for the American public begins now. The questions we're posing today to our panelists here as conversation starters relate to some of the fundamental aspects of the TGDC recommendations. The questions are asked so we can continue the open and recent discussion began in Austin on the direction that we are charting for the future of voting systems.

So thank you once again for participating today. And Merle I give it back to you.

DR. KING:

Thank you, Brian. I have a couple of ground rules that we've used at the prior discussion that I'd like to share and ask your help with. The first is in order to manage who speaks and to ensure that they can be properly recognized if you would put your tent card up vertically and I'll try to go through in the order in which I see them pop up, but that helps me identify who wishes to be heard on a specific question or specific topic.

We've got seven major questions to address today. We've got four hours. We've got 11 panelists, and three of us work for the government. So we're going to have to keep on track in terms of pushing through these questions. It's important that we address the full scope of the questions not only because they're relevant to the VVSG and we think relevant to the interest of the vendors, but they represent a symmetry in the other roundtable discussions that we are sponsoring and it helps us measure the interaction between the different constituencies and their viewpoints on similar questions. So I will appreciate your help in trying to move forward on managing the discussion.

So each question will be introduced. I think there are three questions that will be introduced by vendors who volunteered to do so. I'll introduce the other questions. The purpose of that is to kind of set the tone for that question, put it into a context and a frame to help spur discussion forward. Each panelist will have plenty of opportunity to comment and to follow-up on comments. And to that end our goal is to get through most of the discussion, if not all of the questions, prior to a lunch break. And then we will use the follow-on session to kind of clean up, what things have after a morning of reflection need further discussion that was not addressed completely in the initial treatment of the question. And then each of us will be allowed to make a summary, kind of closing comment to make sure that the audience, the EAC and the other members of the panel benefit from a perspective on an essential component or components to the discussion.

I will ask if you have already submitted a paper to the EAC, a position paper perhaps as a part of the comments, that feel free to comment on the content of that paper but please don't re-read it into the record. We've already got it on the record, and that will be helpful.

And then finally when the invitations went out for this panel each vendor was asked to make sure that the participants at the discussion were prepared to talk about the standard and the technical aspect of the standards, and that will be most helpful. On the other hand, marketing presentations won't really work very well here because nobody is buying equipment here today. So if you can direct your comments either towards the industry or if they are firm specific please keep it as generic as possible because I think that will be of the most benefit to the other participants here at the panel.

Before we start with the first question I wanted to take a little bit of privilege and talk about what the voluntary means in the voluntary voting guidelines. Often as an employee of the State of Georgia we at the jurisdiction level interpret the voluntariness as meaning that a state can either opt in or opt out of participating in the standards. But the voluntary means a lot more than that, and it's often not stated that it's voluntary for the vendors, too. And for those of us who buy product and use product we're very appreciative of the fact that we need as many vendors to stay in this game as possible. And that as this process goes on, and I was looking at the U.S.A. Today paper it was highlighting some of the changes, we're very aware that investors in the companies that you

represent have alternative opportunities, that election systems are critical to us, and we appreciate the fact that it's voluntary for you all too. I wanted to make sure that that gets said today and that for those of us who use product we desperately need as many good vendors to stay in the market as possible.

So with that the first question, and Matt if we've got that up here, the first question is dealing with the business model. And that may seem an odd opening question, but for those of us concerned about the implementation of the 2005 standard and the 2007 standard the question has arisen about is innovation a deeply held cultural value in the vendor's organization? Or are vendors moving towards service models that seek to exploit existing technologies? And that's going to feed back into the design of the standard, a better understanding of the business models of the vendors that are currently in the industry and those that will come into the future. So the question is what do you think as vendors will be the dominant business model for voting systems vendors in the coming decade? Will the vendors be innovators? Will they be service providers? Will they be providers of innovative services? Will they be neither, both? And I think for those of us who buy product we have this discussion all the time and so hearing from the vendors today will be instructive for us.

I think Larry has volunteered to make a preparatory statement on this part, and so with that Larry I'll turn it over to you.

MR. HOLMSTROM:

Thank you, Merle. I hope my voice holds out. I apologize for my voice. And I appreciate the opportunity to address this panel.

When I sent a note to Matt, I suggested there were a couple of topics I could -- we are interested in and so I -- he chose two. This is one of them. So if you'll go to the next slide Matt I'd appreciate it.

These are some basics that we think are important. We think accuracy is important. Every vote counts. One vote is the -- to me is the accuracy goal. We personally believe in the notion of independent verification and software independence. Again that's patterned after the notion that the financial transaction model has demonstrated great success over the past years. We believe that the voter-verified paper ballot is indeed the legal record of the vote -- should be the legal record of the vote. Cryptographically secure is important. All data should be signatured. We believe a fundamental basic is audit, not recounts. And accountability on, I've invented a term called, indictability so that if someone messes around with an election you might not stop it but you can determine who it was and take appropriate action. As you know, that's the greatest deterrent to theft in retail businesses are cameras. In some cases the cameras aren't real, they're just there. And the last thing is to optimize voter satisfaction.

Much of the data I'm going to be talking about comes from the new report that was recently released, I have a copy of it here, which is the human factor study as the accuracy and satisfaction of voters in use of various kinds of voting equipment. It was the first report out that tended to indicate that a DRE has a higher voter satisfaction than the PCOS does and it addresses the accuracy of measuring a voter intent rather than the ability to count. And so we'll talk about that if you get the next slide, Matt. Next slide.

Just some numbers. I'm always a believer in numbers mainly because I want to work on the 90 percent problem, not the 5 percent problem. And these are out of the 2004 survey with a little bit of thing with the number of precincts, polling places, ballot faces. Most people are suggesting there's about a little over two ballot faces per precinct required and registered voters and polling place workers. I put the polling place worker up there because this is a very, very critical aspect to accuracy. There's probably as many errors caused by mistakes at polling place work as is other kinds of problems. Next slide, please.

The question asked, "what is the model". Again I always like to work off of numbers. I see two models in the business. This model right here I kind of spread it over in these little blue lines. That's what I call the equipment bubble, and that's the equipment that's purchased. And then following that is an election service area which is an annuity. And as you can see, that the process and programming for elections is probably over a period of time, a greater revenue source for a company than is the actual selling of the equipment. But if you want to really make some money, be in the ballot printing business. That is a huge business right now particularly with the current flavor towards the PCOS ballots kinds of things. So I throw that up just to show you that I believe that we'll see -- I believe the market and the proposal breaks itself into two parts. There are those who will create revenue, generate revenue from the selling and installation of hardware and then there's an ongoing stream where those who are supporting the programming of elections. And that as many of you know, that

process is often contracted out by the various jurisdictions and it currently is probably supporting a great deal of revenue of most of the holding companies today. The other vendors would know what those numbers are exactly. So the answer is, is it going to be a service model or an equipment model? It's going to be both. There will be an equipment bubble followed by an ongoing annuity service model kind of a thing. Next slide. I guess that's the last slide.

So that's the end of those comments that I would make. There will be other discussions that take place as we go on, but I believe the larger revenue over time is going to be in the service part, the service business, than the hardware business. So that's all I have to say.

DR. KING:

Thanks, Larry. I appreciate it.

MR. HOLMSTROM:

You bet.

DR. KING:

Okay. Summarizing that last slide that Larry presented, the implication that the long-term behavior of the firms in the industry would tend towards service providers, the question that I have going back to the initial one is, what will be the role of innovation? And, if you agree with the model that Larry presented or if you think it's generally accurate, does that describe your organization? Does that describe the industry as general? What insights could you share with this group and with the audience that would help us better understand whether that's an accurate model, whether there are alternative models that exist? And Ken I'll ask you first.

MR. CARBULLIDO:

Thank you, Merle. I really think I heard -- I think there's two questions there and I'll take each of them. One question is about whether service will be an important component, and then the second question is about innovation and the effect of the VVSG on companies and maybe the industry make-up.

On the first question, as our technology to run elections becomes more and more complex, and that is where it's headed, it's becoming more sophisticated, more difficult for states and local jurisdictions to handle these things when they handle them so infrequently. And I think you'll probably see, maybe even within the jurisdictions, a gravitation towards two ends. There are jurisdictions who have county or facilities, staff, resources that are competent enough, they have funding enough to do and handle these things on their own. You see that today, but I think again as the technology gets more sophisticated the requirement to handle keys, the requirement to deal with all the auditing necessary -- and by the way I'm not commenting at this point in time whether we think technology is going where we want it to, we support all of that -- but the difficulty and the challenge for many and the vast majority of jurisdictions in our country to handle this sophistication is going to be very difficult for them to handle. And so, I think what that will spawn is an opportunity for service providers. And those who are familiar with the technology will be in a good position, if allowed, to provide those services. And so I agree with the slide I saw earlier where that's where a significant demand. The equipment sales are very cyclical and they will drop off and there will be a void, a need

to be filled by those who can provide the services around the technology. It will be in not just learning the technology but the administration, support services, education and training of those staffs, education and training of the poll workers, the hardware and software maintenance itself will become more complex. Election night support requirements are going to be demanding. The ballot layout itself, as we learned, and the usability of that is as important as anything else that the hardware can provide. And so I think there will be an industry spawned about good ballot layout and design, and so that's going to take some support and service. So all of these things I think will be required in the future model and someone is going to need to provide that service.

      With regards to innovation, there's one of two scenarios I believe -- we believe at ES&S could play out. Let me describe those. The number of providers will be fewer. Fewer meaning maybe one or maybe none. The costs and barriers to entry in this marketplace for creating voting solutions are already significant and they are growing. We have, even in our own experience, the 2002 NASAD certification costs ES&S $1.5 million dollars to do. And we're not through with the EAC certified -- certification in 2002. We're well over four, moving into five, $6 million in just trying to get that system -- the systems that we already have deployed put another stamp on. So that's a tripling of costs to get systems certified. And that is very difficult for any supplier to be able to manage. Fortunately we have a good strong base of customers who are looking for this and so I think we're one of the few who can weather that storm. But, I don't know, it's hard to say. As these

standards and the certification and the inspection get more challenging the barriers are higher.

In terms of innovation, we see the innovation as being regulated and repressed rather than encouraged or rewarded. The abilities for suppliers to finance the costs, weather the risks, certify the systems, market them and then stick around to provide that service and support is becoming nearly untenable. The road we are heading down is very possibly for one single national supplier, and that has to be one who has little to no concern for ongoing -- well either short-term or long-term financial viability. I'm not sure at all that that's going to be the business of the private sector. We may find that that single supplier conceivably could be only the federal government, that federal government who is the one who has the resources to marshal and develop with no concern for ongoing viability. That's one scenario, and I'm not -- I don't know whether that's the likely scenario or not. I hope it isn't. The second scenario would be one where this VVSG is turned into more of a performance-based VVSG versus a descriptive feature design description allowing companies, current and new ones, to offer new solutions to meet the performance requirements rather than specified designs that restrict that innovation.

This suggestion has been made in prior testimony to the EAC. We're hoping that this comment period and the review period allow us to adapt this because this would be the scenario that I think jurisdictions, the country, voters and the industry would benefit from. And we're hoping that scenario two plays out.

DR. KING:

Good. Thank you, Ken. I'd like to pause for just a moment and recognize two of our Commissioners who have come in after we got started briefly, Vice-Chair Commissioner Caroline Hunter and Commissioner Donetta Davidson. Thank you both for coming.

Ed you have your flag up.

MR. SMITH:

Yes, Ed Smith with Sequoia Voting Systems. Ken took some of the comments that I made around the economics, but I'll speak to a few other additional points I'd like to make.

As I see it like Ken the economics of innovation and, particularly your implication earlier Dr. King, that there would be new entrants into the voting system manufacturing market space I think is faulty. It is not at this time at least in the history of voting systems manufacturing what I believe any owner of capital who wish to deploy it would find that being -- or funding a voting systems manufacturer or becoming a voting system manufacturer is an efficient use of that capital. The business is very risky. As Ken pointed out, there are significant barriers to entry and they are growing. And in fact the industry has very quickly grown and had a very rapid trajectory. And like many new product and new technology generation offerings that curve is somewhat parabolic, and so it goes down just about as fast as it goes up. And the slope of the introduction of things like color television sets, PCs and what not have followed those curves and it's been well documented in economics literature. I see further consolidation of the vendor base, fewer vendors, few to no new entrants. There probably will be, and there has been, some dabbling to be a vendor. I can recall

back some few years ago Dell, what was then Compact Computer Corporation, bidding on contracts in competition with other more established vendors who were seated around the table. Today, however, at this point in time if you are a venture capitalist do you see voting systems vendors as a viable and efficient and risk reward appropriate place to deploy your capital gains? The answer to that is probably no.

Like Larry and Ken, I also see that the service revenues aspect of the business will have to increase to maintain any semblance of viability in the marketplace. However, the forces against those price increases are very strong. Simply you're limited by county budgets and to some lesser degree state and ultimately federal budgets. And during poor economic times and tight county budgets, as they seem to cycle up and down, you will find that the jurisdictions are unable or unwilling to fund the appropriate levels of service and sophistication that this VVSG iteration will bring to the table in some years, and even that we're seeing today. So many counties out there seem to be trying to fly the jet engines of electronic voting with horse and buggy IT infrastructures, unfortunately I hate to say, staff members and training and education programs that are just plain and simply not suited to the level of technology and sophistication that we see today. Now we're going to take a quantum leap in order of magnitude up in terms of security, sophistication and the usability of the devices. And by usability I don't mean the accessibility and usability to both the voter and the poll worker perhaps, but to get through the equipment preparation for the election with some of these security

measures in place that are in the draft VVSG will create barriers, difficulties, additional steps, additional things that have to be done right and in the right order to get the equipment properly prepared. I see those as posing greater needs, as Ken stated, for service and support from the manufacturer community that's going to be a train wreck with the additional costs incurred by the manufacturer and the need for additional revenues and the lack of those dollars at the county level. Thank you.

DR. KING:

Okay, thank you. Larry?

MR. HOLMSTROM:

These will help my voice, I apologize. A comment as I ponder this issue, the computer and the networking industry went through a similar process, as the new standard comes in we're open to some interfaces and open-source become almost mandatory at this point. We expect to see the emergence of a class of ISP service providers who will essentially provide the kind of funds that Ed talked about. We see a similar thing take place in the computer industry. For example, networks in the Internet came into being. A person who wants to participate in that must receive a certification in general. So they are a certified network engineer or a certified Microsoft engineer, or there are certification processes where a person must pass a certain level of knowledge and sophistication to essentially be hired. And I see that starting to take place in this industry. We saw a similar thing take place as the Internet came into place. The Internet being an open network, an open source spawned an entire industry of people who create Web pages and

there are millions of projects out there, each one requires a couple
Web pages. And so I can at least start seeing lots of people
becoming -- there's small barriers to entry to someone to go into
become an election service provider and unless there is a
certification process required we're going to get a lot of poorly
qualified individuals participating in this business. So I would
recommend that part of the standards process is that the
requirements be -- start to be identified whereby an individual or a
company can be certified to work on providing elections. And I
believe it's going to be in many cases standard driven because it's
going to often be unique to a vendor. But there needs to be a
certification process taking place or we're going to have disaster
coming down the track.

DR. KING:

I want to follow up on a couple of things that I heard and I'm going
to do it in reverse order. Larry, I think that some of the good news
is that there are organizations like CERA that have recognized the
need for a technology component in their certification process and
we're starting to see more statewide jurisdictions look at
certification of election officials. In all the models that I've reviewed
there is a technology component.

But I wanted to come back to something that both Ed and
Ken have hinted at, or said directly, and that is the unintended
consequence which we know is what drives everything in elections
that the complexity of the systems that may be derived as a result
of the 2007 VVSG may be manageable by the testing labs for
testing, may be manageable by the vendors for construction, may

be manageable from the financial point of view, but when they reach the customer level, the jurisdiction level, that there may be downstream issues on support and utilization at that level that we have not given sufficient thought to. And I'd ask for comments on that.

Let me go with Tab first if I can Larry.

MR. IREDALE:

Yes, this has always been one of the struggles we've had with developing systems for many years now is when trying to improve -- and the focus here has been really driven by the security aspect -- when trying to improve security, it takes a fairly knowledgeable person to know what they're doing. If you have an inexperienced person trying to manage security, you're probably going to not do it right. And as the standards try and impose higher security requirements, definitely the aspect of key management, managing of that aspect of the system is going to become beyond the scope of most jurisdictions. We deal with many jurisdictions who have part-time administrators, you know. You might have a staff of two or three who are primarily clerks who have no formal IT training, don't really understand security. They're lucky if they remember to lock the door to the office in the evening. So, you know, you are definitely dealing with that environment. And in trying to raise their training level I don't think that's going to be possible. As Ken suggests, I think they're going to start relying very much on vendors to provide that information and we're all going to be seeing that. Setting up a Windows network, most companies don't have the expertise how to securely set up a Windows network. So it's going

to be a requirement to go find people who have that whether it be the vendor who is probably going to be the most likely supplier of that information, or whether it's a third party who is somehow qualified and certified to do that.

That does lead to, you know, to the core of what you're talking about here and that is I honestly believe that in the long term vendors are going to end up providing a lot of services and that's going to become a large source of their revenue. Whether counties can afford that is another question. On the other hand counties have to run elections. If the standards stipulate that they must do this, they don't really have a choice. But that is one of the consequences of this and counties are going to have to make some tough decisions about where they spend their money.

The other, you know, aspect of this is that we will as vendors struggle to try and make systems that are secure and easy to use. The standards do try and stipulate that it's got to be easy to use, but there are -- and that's sort of your normal security triangle; cost, ease of use and security are the three and you get to choose two of the three. We're getting pushed -- traditionally we were down at cost and usability. Well now that the market is changing we're getting pushed up to security and there are severe costs to vendors -- to customers, counties, jurisdictions in making that decision.

DR. KING:

Thank you, Tab. Larry?

MR. HOLMSTROM:

I was with IBM for many years as part of the group that developed the IBM PC and I've watched this process over the last 25 years.

And I'll show you a slide later on when we get to question six.
However a very sophisticated process has been taking place
because the user technology required is hidden. For example
almost everyone here has used security the last time they signed
on with a credit card to pay something on the Internet. That
actually invokes a complete security model including encryption
and keys and everything else. So that I really believe that the -- a
requirement is going to be that the vendors provide a complete
solution, not just hardware, and that many of these problems can
be completely resolved, have been solved in the computer industry
very successfully, and we just need to eliminate the stuff that's
already in there. Candidly as I look at some of the processes that
I've looked at on some of the voting systems they're kind of archaic.
They're probably ten or 15 years behind where the rest of the
computers are right now. I believe that needs to be fixed or indeed
we'll have the disaster people have been talking about. But it does
not have to be a problem.

DR. KING:

Okay, good. Thank you, Larry. Ken?

MR. CARBULLIDO:

I thought it might be good just to give maybe a couple examples in
the standard where it will be more difficult for county administrators
to manage their election processes. And here's the -- I think it will
illustrate the challenge of this review process.

I would venture to say that -- first off let me start saying that I
think the standard was -- the newest standard was very well
organized, very well written. I'm very impressed by the way NIST

has defined requirements in there. I'm not saying right now -- don't take that to believe I agree with everything in there, but I'll say the structure of it was well done. So I would complement NIST on that. But it is overwhelming. It is extremely large. It is very difficult because of the immensity for anyone to read it, even those of us who have been in this industry and understand systems development construction. But some of the implications in there reach out to county administrators who have no way to be able to read that thing and realize that something called role-based security deeply within the annals of a standard somewhere buried in that 800-page document is going to rock their world. They have no idea what that means. If it's not explained or taught to those who are going to use this some of those standard, it's going to get somehow hopefully not passed on and accepted and approved and then whether it's 2010 or 2012 it's going to entirely change the way Hall County, Nebraska has to manage their warehouse and their precincts and they've got no idea it's coming. So something like as simple as role-based security or the concept where two people have to do something so that there's that type of two eyes and two hands and checkpoint security, those things are kind of buried in there.

And, you know, you think about even the large jurisdictions and the challenge of poll workers who come -- are scheduled but don't show up at many, many of the polling places, if each one of these poll workers has to be defined in some kind of security group that is -- has credentials or authentication to that device that's being opened up in the polling place and I don't have that poll worker

show up or I don't have him in the list but he's got to go open that device in the morning, that administrator will not have realized that and we will not have an open -- we will not be opening polls at the right time all across the country when that standard and those systems go out and they're not ready for it. That's a good example of how things are going to change and if we don't have good review and a good education process of the standard of the people that really have to use it, then we're headed for a train wreck on that day that these standards have to be enforced. Okay?

DR. KING:

Okay, good. I remind everybody, too, if you would state your name before you make your comments and that will help our transcriptionist at the conclusion.

I'd like to begin winding up this particular question to stay on schedule. But Bernie, please.

MR. HIRSCH:

Bernie Hirsch with MicroVote. We've been in the business 25 years and it's my understanding we had maybe 15 vendors and now we have five or six in the business and we've heard from several people that basically lots of people are getting out of the business or consolidating. And I think what we have is a Rolls-Royce mentality and a Wal-Mart budget, you know. We've got lofty goals and I agree that the newest standards of the three that are in play in right now are well written and well organized and it almost seems like another programmer wrote them, and object-oriented programmer as I read them.

The problem I think as vendors we have is that the standards keep -- the bar keeps getting raised and we have real live costs to incur and we've been having to shelve our lofty ideals for the future in order to make our current systems compliant. And we've seen a ten or 15 time increase in the cost of doing business in a very short period of time. And many of the vendors sitting around this table have instead of spent their budgets this past year on, you know, the new stuff that we want to bring into the market next year they've been spending their budgets on becoming legally compliant and bringing current systems up-to-date and trying to not make them really any better from a practical user standpoint, because I think for this country we already have a really good election system. We have very few real problems with our voting in this country, and the ones that we do end up having many of them are caused by human error as opposed to machine error. I think that the direction we're heading in when you continue to introduce new standards every couple of years and sort of not grandfather in the old ones too well, it causes lack of innovation. So when you talk about, you know, where are we going I think we're legislating innovation out of the picture and I don't really think that's the way we want to go.

I'm a pilot and I know that when I fly a small plane if any of my brothers and sisters who fly a plane have an accident, 80 percent of which by the way don't end up in a fatality, it makes the headlines. And, you know, if one vote doesn't count that makes a headline. But as an industry we probably have a stellar record, probably the lowest error rate of just about any industries, including

aviation. And I think we should be proud of that, all of us sitting around this table, that there has been a lot of due diligence and a lot of effort made to make our systems as full proof, fail safe as possible. But if we continue -- so what I'm advocating is perhaps putting the brakes on some of the new and lofty goals that we have for the future, which doesn't exist right now and takes years to develop, and while that future is being defined the marketplace is not putting more money and investment into infrastructure. And so we have our bridges and roads falling apart, and that's our election system, because we'd rather design something new and great for the future and not really look at what we have and try and make it as best as we can. So that's my opinion.

DR. KING:

Okay, thank you Bernie. Ken did you have a comment?

MR. CARBULLIDO:

No, I'm sorry. I cannot just say anything I want any time without it up, right?

DR. KING:

No.

MR. CARBULLIDO:

No? Okay.

DR. KING:

I do want to move on, but Mark go ahead.

MR. SKALL:

Thank you, I'll make this brief. I think what I'm hearing is that we all agree there are a lot of requirements that really need to be adhered

to and fulfilled but that there are a lot of requirements in this version of the VVSG that will be very expensive to implement it.

One approach that we considered, an approach that's used in many other standards development, and we did choose to reject it, is sort of a tiered approach. Many standards come with different levels and you can conform to different levels. It might be a minimum level which clearly costs less, another level is built upon that, and so on. We felt in this particular version everything needed to be implemented, but perhaps another approach that we may want to look at is something like this. I'm just wondering what everyone's thoughts would be on a tiered approach like this.

DR. KING:

I have one question I'd like to ask just for clarification. Mark when you say "costs less," is that costs less to manufacturer a conformance system or costs less to test the system, or both?

MR. SKALL:

Well I think I'm hearing both around the table.

DR. KING:

Okay.

MR. SKALL:

And clearly the more requirements you have it's going to cost more to implement a system and clearly it's going to cost more to test. So it would be both.

DR. KING:

Okay.

MR. CARBULLIDO:

Merle, you're going to have to stop me. I'm having to comment every other minute here.

DR. KING:

One minute, please, then.

MR. CARBULLIDO:

Okay. I think that's a very good suggestion. I don't think enough people have understood that that is something we ought to be considering and that's changing -- consider changing the conformance clause absolute that's there right now. This industry hasn't looked at a lot of formal standards. They don't realize there could be grades. We're all concerned that we got to have an "A" with an integrated system, and we all want that. But as an example we could consider, as maybe a stark example, within this next VVSG there is the requirement for a hardware base Crypto-Module. That standard will obsolete everything out there, everything that we have that anyone bought to this point that single one standard for hardware base crypto will. But that design standard, which is what that is rather than a performance standard, if the performance says we have to have strong encryption protection to this degree, then we could do that in software say. And there may be hope that the software -- or the hardware that everyone has bought can be used again. And we could, say, have a graded system that maybe we don't have to conform top to bottom with everything, but maybe under hardware we could conform to the 2005 standard and under accessibility and usability we can conform to maybe this next generation standard, you know, without -- and then jurisdictions can have a choice. They can still get an EAC stamp. They can still get

an approval, but a jurisdiction who can't or a state who can't afford throwing away all their hardware could say you know, "I choose -- for the money I've got available to me I'll keep my hardware but I'll take the -- I'll require the highest accessibility standards." They can have a choice.

And so I think we ought to strongly consider changing the conformance clause absolutes that are in there right now. I think that's a good recommendation you should be considering.

DR. KING:

Okay, very good. Thank you Ken and thank you Mark. One of the things that again we'll be able to do is...

COMMISSIONER HUNTER:

Excuse me, Merle. It's very hard to hear you.

DR. KING:

I'm sorry, let me switch to this. Is that better?

COMMISSIONER HUNTER:

Thank you.

DR. KING:

Thank you. At the end of the session today remember that each of us will have an opportunity to make some summarizing points, and maybe that's a point that we want to come back to after we've talked about component testing and see how that all kind of integrates together.

Matt if you could go to the second question. The second question that we want to look at this morning is the proposed innovation class section of the 2007 VVSG a viable approach to certification testing? As written, how would it impact your firm's

strategy for developing and marketing systems? Standards are required particularly now that we're in the, depending on how you look at it, second, third generation, fourth generation of voting system standards. They have to safeguard between the gains that were realized in the prior standards and at the same time facilitate innovations in to the future. And every organization here or elsewhere has a capacity for innovation. Some organizations by design are bureaucratic. They're organized around functionality and they look to others in the industry to be the innovators and their strategy is to be a fast follower into the market that's created by the more risk-taking innovation firms. Firms that take those risks, on the other hand, must have time in market to recover the costs associated with those risks. So one of the concerns that's been addressed about the draft of the VVSG is, does the innovation class component specifically provide a reasonable way to accomplish that innovation? Who will be doing the innovation in our industry in the future? That has been a question that's come up whether we will be looking to the vendors who, as Bernie said, have been in the industry a long time, whether it will be the new players, whether it will be academics who may be working from the outside in. And ultimately how would you like to see the standard address the innovation needs within the industry, the things that we've had to postpone of the improvements that our customers may be demanding or that may be required legislatively but aren't compatible with the standard? Are there alternative approaches that would be more effective and more efficient than the proposed innovation class? And are there any risks in our industry

associated with just maintaining the status quo of sticking, riding what have into the sunset if you will? And how long can our industry afford to stand pat on our existing technologists? So with that I'd like you to reflect on the question and open the floor for comments. Ken? Thank you.

MR. CARBULLIDO:

I wouldn't say anything but I thought somebody ought to answer your question, so I'll offer my thoughts.

First we think innovation class is a little bit -- quite vague in this standard. It's vague enough to be confusing to those of us who -- and for many of us to misunderstand it. For example, one reading is that it's really just a subclass of the software independence class and the innovation is restricted to just that space. That is our reading right now. We could be wrong. Because it's so elusively defined we could be wrong, but that may be all it is. And others may think, well, no we're talking about innovating all kind of things whether it's reports or user interfaces or new accessibility tools. I don't think that's what it is. I think it's just a different way of dealing with software independence. And so I need someone to help me understand what this innovation class is. As written, as we understand, it does nothing for innovations in the voting device and functionality areas. It's really just innovation in software independence.

DR. KING:

Okay, thank you Ken. Mark?

MR. SKALL:

I'll try to explain how the innovation class came about. I'm not sure why you read it like that, but that was not the intent. So we've all discussed about how a moving target for these standards is not good if you have standards come out every two or three years and by the time you finish implementing a standard another one is there. The intent of the innovation class was really probably poorly named. It was a way to incorporate new requirements, functionality, procedures without having to rewrite the standard. And there are parallels in other standards like this where you can register new concepts and they will eventually migrate into the standard without having a complete new standard. That was the intent.

We, of course, did think that one of these new types of approaches would in fact be a way to address the issue of software independence in a non-paper way. Certainly that was in the back of our minds. And clearly we hear about different bills that require paper, we hear that the standard requires paper. And one of the things we want to do is have a way to do independent audits electronically. We certainly think that -- I think first of all we thought on the TGDC, and I'm speaking as a member of the TGDC now not as a member of NIST, I believe the TGDC thought as a whole that one could not write requirements now to do these independent audits electronically because they weren't well defined, and so we have this concept of introducing new functionality into the standard. We would be able to use it hopefully to produce new ways to do electronic audits. But the intent was to incorporate new

functionality without having to go through and develop a whole new standard.

DR. KING:

Okay, thank you Mark. Ed, then Bernie, then Tab. Ed, please.

MR. SMITH:

My belief stems from an earlier comment that I heard before today, but an earlier comment towards performance-based standards versus technical, detailed requirements. It is my opinion that a performance-based written standard would not need this section of the standard. Thank you.

DR. KING:

Okay, thanks. Bernie?

MR. HIRSCH:

I think it's great to come up with a way to make the whatever standards are in place flexible enough to go into the future without having to rewrite yet another set of standards to be complied with. We're currently in certification of the 2005 standards which have some significant differences from the 2002, but it would have been great if we were sort of all working from the same set of standards at the same time. I think from an administrative standpoint it's easier. From a cost standpoint all the competing companies are competing for business using the same set of standards. It just makes our whole industry better. And so any way that you can I think -- now I'm all for being able to design software and hardware to a very specific goal. It would be really nice to be able to do that. Because we continue to have these new standards come out it's been very difficult to design because as soon as you finish your

design now you're having to rewrite the whole book again. So we think at MicroVote that there are a lot of alternative methods from paper. We have both paper and electronic-based systems within our voting system, but we feel that there are alternatives that should be looked into certainly as an alternative to all of the problems associated with handling millions of pieces of paper every election that would be a way to provide software independence.

I feel that there might be ways that we could use that same sort of flexibility in other areas of the standards that aren't there now. One area I could think of right away is in the area of software development and coding. Right now we're coding to the latest Microsoft standards but we all know that Microsoft comes out with some new language every couple of years, and we don't know in 2010 what's going to be introduced and what everyone is going to gravitate towards and how that's going to not really fit into the standards as well. So instead of just sort of narrowing it to the vertical application voter independent verification issue, perhaps it should be looked at more of a way to innovate other areas of the standards to make them more flexible into the future so that you're not rewriting the book every couple of years.

DR. KING:

Thank you, Bernie. Tab?

MR. IREDALE:

I just wanted to clarify something. I thought it was mentioned that the innovation class was not a subset of software independence and yet the standards very specifically indicate it is a subset of software independence. It is not a subset of independent verifying

voter records. It's, you know, an alternative to a paper record or something that the voter verifies, but it does require software independence. So I just wanted to make because I was a bit confused on that aspect.

DR. KING:

Okay. James I'm going to let Mark respond to that and then pick you up. Mark?

MR. SKALL:

Okay. Again I believe what it says, and we can look at the words in the break I guess, is that certainly software independence can be satisfied via the innovation class. That is not the same thing as saying the innovation class can only be used in software independence. We envision -- in fact we have to -- one of the problems, as we all said, is the concept is vague because an innovation class by definition has to be defined by its procedures in what has to be done, who has to review it. We felt that that was something that needed to be done by the EAC. We at NIST of course will help any way we can. So we couldn't define it more precisely. But we envisioned, just like Bernie said, different submissions going in from many, many different things. Again one way you can achieve software independence is via the innovation class, but a software innovation class is not restricted to those types of submissions. One can make a submission for any new innovative concept that they believe needs to be adhered to as part of the VVSG. So again I guess we could look at the words and where you're getting that impression afterwards.

DR. KING:

Thank you, Mark. James?

MR. HOOVER:

I think I echo even the first comments from Mr. Carbullido on the document and the description that's provided that the first reading of it is extremely vague. It doesn't really explain the process very well of how you would after proposing what are the mechanisms. And I heard hear today that it's a method of. I guess my first impression was that -- it would almost be a comment on a future standard as opposed to a way of including an innovation in the current standard. So the front end I guess -- I think I understand the concept of the innovation class but how it actually is going to roll into the future or how any of us would actually use it probably should be more clearly defined, even just from a process, before any of this is released and becomes the rules of the road as it goes for us in the future.

DR. KING:

Thank you, James. Andrew? Or Andy, I'm sorry.

MR. ROGERS:

One of the things I wanted to point out that we perceive about the concept of an innovation class is the opportunity in this class to have an early risk assessment and a lowering of innovation risk by the vendors. The process paper that was written by the STS that goes kind of along with this concept mentions a process for coming in early on before you necessarily productized an innovation and getting that kind of an assessment. And referring back to Ed's comments earlier about the difficulty in justifying investment in this area, anything that we can do early on that will give us those kinds

of assessments lowers risk for vendors, and so that will enhance

the ability for us to be able to invest in innovations.

DR. KING:

Okay, good. Thank you. I'd like to make just a few comments. I

want to keep us on schedule, but I heard something here that I

wanted to make sure, and I think Bernie you first captured it and

see if I can record this properly in my own notes, that the

philosophy of the innovation class is a good concept; that the

philosophy of a mechanism that reduces risks, reduces the barrier

to entry for innovations into the voting system market is a good

concept, but can it be spread throughout the standard and have

sufficient flexibility that the innovation can occur across the broad

spectrum of functionality of voting systems and be integrated

throughout. Is that a fair statement?

MR. HIRSCH:

Think of it like a multiple choice question and you have "Other" as,

you know, choice "E." "A," "B," "C," "D" and "Other." And that

doesn't necessarily negate -- you know, if you checked off this

requirement by doing "B" or "C," that's fine. But I like the concept of

at least having an "Other" in all the areas of design. And I agree

with Andy that if it could be done earlier in the process it lowers

risk. It increases innovation which is I think everyone's goal, you

know. We can all go to our higher ups within our companies and

perhaps try and get something maybe not pre-approved but at least

have someone give it a look and say, you know, "That's a pretty

good idea. I think that has a really good chance of passing muster

once you've, you know, made it into something that we all invested

money in now." So I would just -- right now it's definitely just a part of software independence the way the class sits, but I think you should consider a class like that as a subclass of other areas of those standards so that if you do have an innovative idea or you do try and adopt a new language you're not trying to squeeze it into a standard that's now five years old.

DR. KING:

Okay. Thank you, Bernie. And Mark last comment.

MR. SKALL:

So, again, exactly what Bernie said, exactly what you said Merle. Was the intent, and if that's not reflected in the words, now the words need to be changed to make sure that we understand that is the intent.

DR. KING:

Thank you. Matt could we go to the next question, please, question number three? One of the components in the new draft of the VVSG is the open-ended vulnerability testing model. And the prolonged question is what are the risks associated with this? Do you currently conduct some form of this already within the organization? In other words, is this feature of the standard potentially redundant to practices already in place in the industry? And Ed had volunteered to make some opening comments on that.

MR. SMITH:

Well once again, good morning. My name is Ed Smith with Sequoia Voting Systems and I took on the introductory remarks to open-ended vulnerability testing, which is question number three.

On the second slide I just restated the questions that Dr. King placed in I guess the pre-meeting notes. What is the value of the open-ended vulnerability testing model? What are the risks? And to the manufacturers do you conduct a form of this testing as part of your development process? And in these few opening slides that I have I did not choose to state an opinion or to answer these questions. I would assume we'll do that as a group. I did put forward some additional comments though in the subsequent slides.

One of my thoughts around open-ended vulnerability testing is this. Having grown up in my career in manufacturing and starting there, one of the things I learned early on as a manufacturing engineer is that if people cannot know or do not know that their work output is complete, accurate, appropriate, correct, or right, however you want to define that, whether it's soldering components to a board or whether it's developing complex software or even a system architecture, you don't have a quality process. People need to know that their work output is to spec. And with open-ended vulnerability testing I ask the question does it contribute or detract from the, in my opinion, basic tentative quality? Also, one of the concerns I've heard expressed before today is this open-ended vulnerability testing completely dependent on the caliber of the test team? How can you ensure that it's consistent? You may have a group of open-ended vulnerability reviews that circle the bulls-eye of a target and if you average them they're right in the middle of the target but each individually is very far off the mark because they're not consistent or accurate or have an appropriate framework.

What are the cost benefits and risks of open-ended vulnerability testing? What does it really teach you? What can we really learn about voting systems? If we want to describe to each other, to members of the voting public, to jurisdictions, to Commissioners on the Commission for instance what are those benefits, are they easily articulated? If they're not easily articulated, then why is that? And are they really there if you can't describe them very simplistically and very concisely?

And then lastly how does open-ended vulnerability testing align with other aspects of the testing program implied and sometimes required in the draft VVSG and its conformance clause which is essentially a pass/fail type hurdle for us to jump through? Thank you.

DR. KING:

Okay, thank you Ed. I'd like to kind of add a follow-up observation and question to this group. If the open-ended vulnerability testing model has merit, has merit either from the public's perspective or from an R&D focus, could the open-ended vulnerability testing program be administered separately from the standard? If it has merit, can it be retained in a format that still delivers that merit without it? As I think Ed pointed out, and I have to say I share your thoughts, that when you are designing work for teams one of the things that's important is the team knows when the task is done. That has morale implications. It has contract delivery implications. There's a lot of aspects to it.

So with Ed's comments, I'll open the floor to discussion on the issues related to vulnerability testing. And Bernie before you

comment, I'd like to acknowledge that Commissioner Gracia

Hillman is in the audience. Thank you for coming.

MR. HIRSCH:

I think all of us conduct our own forms of open-ended vulnerability

testing as we're developing our hardware and our software, you

know. We have teams of people at our company that hit our

software in all kinds of ways and our hardware that we never

intended when we were designing it and come up with things,

suggestions for us to improve and tighten up security and

vulnerability and all that. So we go under the premise that if we can

catch something, a problem in any one of our systems sooner than

later it's less expensive to fix. And the last thing we want to do is to

let those problems filter down to our customers because that's the

most expensive to fix in many different ways. So -- but then you

have to balance that with being able to design to knowing this is

how our system is going to be tested and being able to duplicate

those tests yourself to, you know, sort of guarantee before they get

tested that they're going to pass the test as well as you can as a

designer. So you have these conflicting interests going in.

I think it's probably a good thing to have open-ended

vulnerability. I think it outweighs the negative part of that in the

sense that it will hopefully keep any unforeseen problems out of our

customers' hands. The problem that we've seen in practical day-to-

day application of that, even in today's standards, is that the people

doing the testing are of varying levels of, you know, ability and they

have differing levels of access and knowledge that the end user

wouldn't typically have. And so it comes to the point of there has to

be some of judgment/oversight of that process so that it's sort of reigned in some because then you risk having testers going about testing your system in a way that's not the real world, you know. "Well if "A" happens then "B" can happen, then "C," and "D," and "E," and "F," and you have this long chain of events leading to some conclusion that's probably completely faulty. So, you know, if you give someone the keys to the bank and you give them 24-hour access and they know exactly which safety deposit box to look in and all that. And typically the testers have lots of inside knowledge of our product that the public and even a very good hacker wouldn't get access to. That's I think the risk. And all of this then translates to cost and time and then that takes away from innovation. So it's all interrelated. It's not just do we want it or don't we. We just have to balance -- make sure that there's some oversight in the process. That keeps it defined for us.

DR. KING:

And Bernie if I can with a follow-up. Larry had made a comment earlier about the possibility that our industry may be evolving towards open source. Do you see that as having an impact on not perhaps a formal program called "open-ended vulnerability testing" but in fact functionality of that occurring within an open-source community?

MR. HIRSCH:

You know, living sets a good example of an open source system that, if that's what we're talking about, where you have all kinds of people contributing to the effort. I think in this case with the investments that all of the private industry is making it's not a

practical solution to have an open source, you know. There has to

be sort of reward to the risks that are taken and the risks have just

mounted so tremendously over the last few years. We're already

seeing less and less investment being made and I don't think we

want to do anything further to erode, you know, the private funds

that are going into this effort. And I think by opening our source

we're also opening up risks. We're introducing risks to the system.

And again you have to weigh what's to be gained and what's to be

lost by opening up your source because now you're basically giving

the world access to how everything works, too, and that's not

necessarily a good thing. Not from the standpoint that we have

something to hide but from the standpoint that now you sort of can

pick away at, you know, you know the intricate workings of the

clock and I don't think that's going to be good for security.

DR. KING:

Okay. I've got Ken, then Andy, then Tab, and then Larry. Ken?

MR. CARBULLIDO:

Thank you, Merle. There is both value and risks in open-ended

vulnerability testing. The value and the goals as stated in the

OEVT section of the VVSG are laudable. This value is regarding

discovery of vulnerabilities that may not have otherwise been

discovered, which would have led to a false sense of a system that

is secure when it wasn't. So there is value.

The risk I think is, besides the risks already identified by

others today, is about responsibility and it's about having

responsible open-ended vulnerability testing and responsibly

communicating the results. And you could point to examples in our

industry, some will debate me in some of these examples, but as practiced recently we've seen some OEVT conducted and it's produced some excitable results fueling emotional, academic, hypothetical and political discussions. Yet in reality much of it remains immeasurable and debatable in terms of true real-world assessment or value. So someone can do a test and they can say, "I can bring in a hammer and I can render this device out of service and a denial of service." Yes that's true. Or someone can talk about the fact that there is a chance and a possibility that I may actually win all the gold medals in the summer Olympics coming up here. There is that chance. And if I don't responsibly communicate the reality of this, then you almost diminish the confidence in the systems -- in the voting systems across this country. That's irresponsible. And that's what we have to do. I support OEVT, but it needs to be managed and it needs to be done responsibly and it needs to be communicated responsibly. And then I think we have a good thing.

DR. KING:

Okay, good. Andy and then Tab.

MR. ROGERS:

To add to both Bernie and Ken's comments, I'd put it a little bit differently. OEVT is valuable as long as it has a measurement system that can take the results and put them in terms as we use in Q/A internally of probability, severity and impact. And that's part of the responsibility concept. We have to have a measuring system that can differentiate between very unlikely events that might cause a large problem and very likely events that cause small problems

but are actually realistic. Some of the examples of OEVT that have gone on in the industry have caused us to focus on extremely unlikely events spending lots of resources to take care of those potential issues and neglect issues that are very likely and most certainly will cause problems that would be much better -- the public would be much better served if we took care of those smaller but more likely issues.

Other comments I think were made in the previous roundtable about what OEVT really serves to do being a measure of the maturity of the development process. I would add that one of the discoveries and one of the usefulness areas of OEVT is also to discover the maturity of the standard. When we discover something that isn't -- wasn't covered in the development of a product, we're not only indicting development process and how the -- how we've carried that out, but we're also finding that there are holes in what we're requiring in the standards. So that should be thought about as we implement these and something that the EAC could use in reviews of these tests, how would this improve our future generations of the standards.

DR. KING:

Thank you. Tab.

MR. IREDALE:

With regard to the open-ended vulnerability testing, it seems with Ken and Andy I honestly believe there is a place for it in the testing process and perhaps in the certification process. It is not a replacement for quality testing, and that we need to make sure we understand. The whole -- one of the basis of doing quality testing

for design is making sure you understand and review your design and start at the top and work down. Again with -- unfortunately with what we have seen, as Ken has mentioned and Andy has mentioned, in some of the open-ended vulnerability testing has been irresponsible testing. It has not really qualified their responses. And a lot of the testers have up front said, "Hey, we're not making any judgment. We're just telling you the issues we found." Many people don't think of the report as actually telling them what's critical and what isn't. So there's been a disjoint there between what the testers think they've been doing and what the people receiving the test report and the public -- general public that receive the reports to be.

A couple of comments that are specifically identified in the standards under the open-ended vulnerability testing is that they do comment that a denial of service defect would be a failure. Ken commented that a denial of service can be done in many, many ways. Hit it with a hammer. It's broken. So again a denial of service needs to really be more qualified by what is meant. I can fully understand if you have completely shut down an election. That's a different story. If you take one machine out of service, that's not critical. That, you know, should not be a failure. So there's some refinement that needs to be done there.

The other one was there was a comment about collision with all the developers and somehow the developers all get together with some other people and get something in there. Part of the source code review, part of the testing process, part of what the standards are and part of what software dependence is all about is

to protect us against theft. So, you know, setting that up as a sort of basis to be able to fail means you can always fail. You can always say, "Yes, all these guys can get together and can somehow subvert the process." If that's a requirement in there, it's a non-starter. And we have to understand and really look at those. And I understand what these guys are trying to get to, but the way the standards are written if somebody wants to fail they've got an open door there to do it. Okay?

One other comment that was just made regarding open source and one of the disadvantages to open source. As we know, our certification process is long and drawn out and it's going to get longer and more drawn out. With open source the concept is a bug is found, a vulnerability is found, it's fixed, it's released, it's out in the marketplace. That's not our market. Okay? When a vulnerability is found, it's going to be there for years because of how long it takes us to get through our certification process. We can try and instigate a fast response and we potentially can fix bugs, but the deployment time is going to be expensive and difficult to achieve. So we do have to be careful about what we want to do and what our model is.

The other one, and again the model talking about some of the newer technologies out there that allow some optimization using the Internet, one of the constraints that our systems all work under is that they are not networked together. They're not connected on the Internet. Therefore, deployment of software is hard, time consuming. We've got to go to every device, turn it on, load software, then run full testing. Okay? It's not a like a Microsoft

update. "Oh fine, we'll update it. We'll see if the system works.
Oh, it crashed. Oh well, too bad. We'll wait for next week." That's
not our business. And so we have to be very careful about trying to
compare with other industries and recognize that there's some
very, very fundamentally different things between maintaining both
your secrecy and maintaining each of these devices as
independent.

      Thank you very much.

DR. KING:

      Okay, good. We've got Larry, then James, then I'm going to go to
Ken. And Brian you're going to get the last word before we take a
break, so you're standing between us and a break when the time
comes. So Larry.

MR. HOLMSTROM:

      Thank you. I'd just like to make a comment about this whole notion
of vulnerability testing. There's an infinite number of ways to screw
up a system and there's no way you can ever test for everything.
However, I believe it's a necessary but not complete answer. The
thing I have enjoyed about the new proposed standard is that the
system design is oriented towards a secure system through audits,
independent verification, et cetera. Those should be sufficient but
vulnerability testing helps minimize the effect of those and I believe
that if a system is designed -- is dependent upon secrecy in order
to maintain its security, it's by definition a foul system. That to me
is the beauty of the new standard, that it places a great focus on
independent verification and on software dependence so the
system is designed to be secure and is not dependent upon open-

ended testing. However, open-ended testing I believe is important because the process of a complete one hundred percent audit are very expensive. So there needs to be a protection there but it should not be the only answer. A system that -- if we're dependent upon secrecy in order to maintain the security of our elections we're making a mistake.

DR. KING:

Okay very good, thank you. James?

MR. HOOVER:

Thanks. I'm going to try to coalesce a few things just the way I see it in that the open-ended vulnerability testing of course, as Bernie mentioned, is part of all of our companies, all of our design purposes. So it occurs, but it is a very qualitative process. It's sitting around a table swapping ideas and coming up with -- it's philosophies and approaches. And I think that sounds in contrast to the rest of the next generation, which is very quantifiable, you know. The first thing you -- the first impression when you read it's very well organized. It's not nearly as confusing as 2005. It's very clear and it's a very clear set of instructions, you know, here's what it needs to do. And then as part of it there's the open-ended vulnerability testing which is not very clearly defined and when it happens it's going to depend on the quality of the people who are doing it, their background. If I'm doing it, it's going to be different than Andy and that type of thing. So you mentioned maybe that there might be an option to consider it outside the standards. I think that might be something that maybe at a future session we can continue with, or I'd like to support. I think it was you who

brought up the idea that that might be an effective way of dealing

with it.

DR. KING:

Ken?

MR. CARBULLIDO:

I'd just like to maybe shed a little bit of light on the difference or

what open-source might mean to different people and how it fits in

some of this testing.

All of us have no qualms about sharing our source code with

those who are qualified to review the system to look at every single

line of code and again responsibly deal with what they see. We

don't want them shipping it around the world. We don't want them

sending it to our competitors. We're okay with our source being

reviewed by a qualified community. We're okay with that. Some

are thinking, well, no open source, I don't give it to the public and

then therefore we're hiding something. That's not at all what we're

about. We're all okay with what we are coining disclosed source.

You can look at it. You can look inside. You can see whatever you

can find. You can help us make it better. But again that should be

done responsibly. Our products are using open-source products

within them. We're not opposed to that at all, but for all of the

investment reasons we don't want to give it away after we spent

millions of dollars building it. So I think we can satisfy the need to

look at every line of source code. That doesn't mean we need to

send it all around the world. And the ideas behind open source, the

protection you need, we can satisfy via that method as well as any

other method.

Some of the things, the good stories, the aura about open source work very well in communities where there's an opportunity to make change. There's many people who can contribute a large, and I'm talking thousands of people, who can make contributions and make it better and then experiment with it, test it and turn it around tomorrow and see how well it worked in thousands of implementations. And as Tab mentioned, we don't have that. We don't get to try this tonight and fix it again tomorrow if it didn't quite work and then try it again and again. We don't have thousands of qualified developers who can make it better. So aura and the appeal of open-source is being confused with the need to let it be reviewed. And I think what we need is the opportunity to be reviewed for security. We don't need and don't have the environment that makes it a good economic model of contributions and re-contributions and experimentations. We don't have that environment. Okay? Thanks.

DR. KING:

Yes, thank you Ken. And I do concur with you that there is some confusion about what open source means versus public source in the community at large. So I appreciate those comments.

Brian?

MR. HANCOCK:

All right, thanks. I won't keep us too long. But, you know, in sitting here this morning, you know, there was a lot of talk about the probability, the impact, the criticality of various vulnerabilities and how we're going to deal with that. I just wanted to make everyone aware, as some of you might know, that we're in the process of

sending out an RIF very shortly, we'll put it up on our Web site and then later on an RFP, to do a very detailed threat assessment for voting systems. It's something that really hasn't been done before on the level that we are contemplating doing this. And I think it will certainly at least attempt to clearly -- more clearly define and prioritize some of the things that you've just been talking about. So hopefully that will be a contributor, a large contributor to the success of this next version of the VVSG.

DR. KING:

Thank you, Brian. And I concur, and I think once that risk assessment is done and those priorities are established then the open-ended vulnerability testing may evolve towards that level of definition that we would be more comfortable with.

I wanted to before we take a break just emphasize what I think I heard as a theme in this particular question, which is the open-ended vulnerability testing has merit if done appropriately and that it may be workable but in its current version it lacks sufficient detail to really make the careful and contemplated decision about how it would fit into the overall process.

And again I'll remind everybody at the end of today each of us will have an opportunity to kind of come back and summarize. So as you're going through the discussion identify those things that you want to make sure as a take-away for all of us who have attended today that those are the points that get driven home.

I'm going to ask that we take a 15-minute break and we reconvene here right at 11 and I think we'll be right on schedule to

finish up for a short lunch break. We'll get all the questions out of the way. So 15 minutes, please.

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[Recess from 10:43 a.m. until 11:00 a.m.]

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DR. KING:

Matt if you could, please put question four up. The next question -- we are going to try to get the next four questions done before lunch, so if we could kind of balance the time of the remaining four questions.

How could the processes of the VVSG be modified to incorporate minor revisions without incurring the costs in both time and money of a total system test while still maintaining the integrity of both the standard and the system derived from that standard? And historically many of us have viewed system testing as an insurance policy on both the system and the standard. And we've looked at it is as a way of guaranteeing the spider web phenomena that those of us who teach software engineering refer to so frequently when you pluck one strand of the spider web the whole web vibrates, and so always looking for the unintended change to a system based on a component change. But one of the experiences that many jurisdictions are encountering is that there's a lack of symmetry in the life span of the components of a system in that some of the components are designed to last for decades, the optical scan units. Some are designed to last for less than that, the DREs but still perhaps with a usable life of ten or more years. But when you get down to the servers which are kind of the backbone

of the system you run into end of life issues after three and four years. And if you go into the servers you begin to run into issues with finding motherboards that were run with the same operating system configuration of the certified build. And so this kind of lack of symmetry in the life span of the components of the system has raised concerns about how do we maintain -- in the traditional IT sense maintain means the maintenance and the functionality and the equilibrium of the system -- how do we maintain these systems over their full functional life when we may still have a requirement for full system testing of any modifications that are done to the system? So a question that I asked to help generate some discussion is can testing methodology be developed that retains the benefits of the comprehensive system testing and adds to the ability to maintain the equilibrium of the running systems component fix and failure events that occur over time? If we implemented a model that included component testing, would that increase the cost of the testing? Would it decrease the cost? How would it change the development and the manufacturing practices of the vendors at the table?

So with that introduction what we wanted to discuss here is how could the standard best accommodate the need for the minor changes, minor revisions, for whatever purpose, over the life of that system without incurring kind of crushing costs to either the jurisdiction or the vendor or both? Okay. Jim?

MR. KAPSIS:

Basically I believe that upgrades are important. They're important and they're generic. Patches are generic to software. Having the

VVSG make vendors compliant to have the whole system recertified over a glitch or something that was discovered by the vendor or maybe discovered in the field, okay, could be extremely costly. And I don't think it would serve the initial purpose of keeping the machines in an updated state which is necessary for us to continue to operate.

The serviceability on the machines is a two-phase type of concept. You have hardware and you have software. Hardware basically is generic. As you just stated, we can take a motherboard from maybe five or six manufacturers touch screens or LCD screens, controllers, things of that nature. What we're doing here -- or what we at Precise are doing is building a computer, a state-of-the-art computer that can accept certain software and integrate it properly in order to get the basic security that's necessary to produce the final result, and the final result is that every vote counts. There is no error of one percent or a half a percent or a quarter percent in our opinion. Every vote needs to be accountable and needs to be -- needs to be redundant.

What I mean by redundant basically is that redundancy is a way of security. Redundancy in printed form, not only in DRE but in optical scanner should be available. For example if you put in a precinct vote in a ballot, it should have the ability to be confirmed with another ballot or a printed record if the voter has actually taken a look at this ballot. In reality I don't believe that voters really look at their ballots after they do them. They take them, they throw them in and they're out of there. We believe that under-voting could be a major problem in optical scanning based on maybe not enough

darkness in the box, lack of ink or a scanner problem with regard to recording the optical recognition. So basically redundancy becomes a major issue and that redundancy maybe needs to be upgraded consistently in the form of a patch. If the VVSG 2007 would allow the submission of a patch for approval, I think the process could be sped up in order to keep the equipment up-to-date and secure. Thank you.

DR. KING:

Thank you. Ed and then Greg.

MR. SMITH:

The issue that you segued us over to, really, is something that you hear throughout the manufacturing community and the jurisdictional communities, too, because it's a point of friction between certification models and requirements and the business model end requirements.

Customers want a fairly steady stream of new features. I think that one of our colleagues pointed out that for instance one of their customer jurisdictions didn't want to see a particular screen when the unit booted up because that was something extra for their poll worker to see or to take action against. Customers -- at least one of our customers wants newer and different audio formats because their recording studio records in a newer audio format than the system they have now from us can accept. State legislators enact legislation with no regard and no coupling to the manufacturers in their state's development cycles. So there is a constant stream of desired and required changes from the customer base that bears no semblance and in fact is antithetical to

the certification model that we are currently faced with with an all or none system level only approach. And so there does, in my opinion, need to be some means to certify component changes, additional features without the all or nothing approach that we see currently and once again, as you pointed out, avoiding the risk of the spider web approach, and also the approach that as you start with a baseline system and you increment and you increment and you increment to it that suddenly that system that you baseline and the system that you actually deploy don't really bear a good resemblance to one another. So when do you cease allowing these incremental changes and come back and say you have to re-baseline through a system of certification process as we see today.

DR. KING:

Okay, thanks Ed. You make an excellent point of moving the discussion to the futurity, which is not only considering the possibility of component testing but then the integration of the aggregation of those component modifications into a baseline system test in the future. I think that's an excellent observation.

Greg and then Mark.

MR. BEASLEY:

Thank you, Merle. I don't want to come across as being negative so I want to preface this by saying that I think the EAC and the Commissioners in this room are doing an excellent job at an incredible task of trying to get voting systems in the public that are safe and secure.

So with respect to this particular issue as to how we think, the manufacturers think that you can improve the process so that

it's a little more cost efficient and we can get things changed in a timely manner, here are a couple of suggestions that we're offering -- that I'm offering. And one of them is to allow testing relevant to the VVSG. Allow testing at the VSTLs to be accepted from one certified testing authority to another. And one of the things that I think we talked about yesterday was if I have an FCC lab run some tests on a machine and now I go to a VSTL, they're going to do the same thing without accepting that data. So they're both highly qualified testing entities. So that if the test parameters are the same then it seems to me that the EAC should accept or allow the VSTL to accept testing from other qualified testing laboratories even though they are not an EAC approved VSTL.

Another thing that we think can be done to help us is to streamline the incredible amount of documentation that's requested. There are ways to do that. We can make suggestions in specific instances as to when you're asking for something and you ask it three or 400 times maybe there's some way to come up with a subset of sorts to where we don't have to because it's time consuming when you're putting together these TDPs, as you well know.

Another suggestion is to broaden some of the aspects of how we can make a change without going through the entire process. You already do have a very good element in there in terms of the de minimis changes that one can make without major consequences. So if we could broaden that to some extent and define that so the ITAs don't have to have a large latitude in terms of the subjectivity of what is and what is not a de minimis change.

So in effect it gets clarified a lot better, then we have a more uniform method of what we can expect when we submit a product to an ITA.

One of the other changes that we think could help, and Ed Smith from Sequoia alluded to this just a moment ago, and that's this concept of trying to eliminate this all or nothing process of getting someone certified. And as I think it was mentioned earlier in this meeting, if not yesterday, if one -- if we could have a product that was certified in let's say just the hardware, that portion of the product could be certified to a 2005 standard so that we don't have to effectively dismiss all of the hardware that is currently out in the open market. So if we could have some parts of the standard apply to an element of the system and then let's say the security aspects of the software part apply to the most demanding of the guideline/standards, then we think that that could help the process, it could help the voting public in terms of what they have to go through because in reality it's the voting public that pays for this in terms of taxes and those kinds of things.

So these are some of the suggestions that I think would help to address that question. Thank you.

DR. KING:

Good, thank you. Mark, then Bernie, then Brian.

MR. SKALL:

Thanks, Merle. You know it took me awhile to understand what this question was getting at, but now that I think I do and I read the question I think there's some disconnect here. So it says how could the processes of the VVSG be modified? I think that's a

misleading question, and let me just give some context. So I often given presentations and show this sort of nested group of testing where you start at the bottom with the standard. The standard defines the requirements as a conformance clause which talks about how one claims conformance. The next level up are tests. You have to write tests to see if requirements are satisfied. Then you need some sort of procedures and policies to administer those tests. Then you have certification. Certification is the process. So I think this has to be addressed by certification, not by any change to the VVSG. The VVSG defines the requirements. It's up to the certifier, in this case the EAC, to decide how to utilize whatever tests are there to determine whether in fact they are comfortable enough to give their stamp. And they need to be comfortable enough to give their stamp to have confidence that nothing that happened changed these conformance and validity of the tests.

I agree if it were real easy, but like Greg said to figure out what a de minimis change was that would be the way to do it. But it's a very, very slippery slope. Every time you make a change, and I think when we all started probably as programmers a long time ago we were shocked to see you make a change in one little place and it shows up somewhere else. So you have to be very careful to really isolate this and really have a firewall around it and make sure that it really doesn't affect anything else. But ultimately it's a certification decision, not a VVSG issue.

MR. HANCOCK:

I think -- I agree and I think Mark just very eloquently stated the point.

DR. KING:

> He's made an even important contribution and he's shortened the
> discussion by one. That's great.

MR. HIRSCH:

> I want to build on what Ed and Greg have said. I think it's in the
> best interests of everyone that more changes happen and not fewer
> as they're identified, although I know that Talbot would probably
> agree that, you know, things need to be sort of set at some point in
> time so you have a way to gauge where you are and where you're
> going without having a moving target.
>
> The easier that we can make it to change is good. How do
> we do that I think the question asks what are some of the methods
> we could use? The current standard, the '05, has a de minimis
> section to it within the certification and testing standards and it
> identifies that firmware and software changes are out of hand not
> ruled as de minimis. So there's sort of this concept that any
> software change has some sort of untold, unknown effects
> somewhere else in your software. And to a small extent that can
> be true. You can make a change and it has an affect that you didn't
> really anticipate and you might not even discover until very late in
> the game, which is not what anybody wants. But we have to
> balance -- we have to balance the regulatory requirement to
> completely retest a system with the ability for a vendor to make
> incremental changes that improve a system in a way that they're
> willing to make that improvement. And I think the way to get there
> is to be very specific and allow the VSTLs to have a way to know
> whether or not this is going to -- which tests have to be repeated.

And maybe there can be some modularity. When you submit a software change, you might be able to identify and have a set of categories say that this change would affect. Okay, so this one is just going to affect the user interface in our opinion. This one is going to affect the way data comes in and out of a particular maintenance screen. You could sort of break down the types of software changes that are typically made in a program, qualify them, if you will, into some groups and then have a way for the VSTL to say, "Okay, the vendor when they submitted these changes they said -- they identified each one what section of the software -- where exactly that change happened."

And we've done this. When we've given new builds to IVATA, we've identified each one of the changes we made and what we feel -- where we've changed our code and how that's going to affect anything we can -- I think that it would affect. And they've used a lot of good judgment to look at the changes to the code. They can see what we've done. They run a dif. They can see every change that we've made. They compare the before and the after and they get a very detailed report on any change that was made to the code. And they should have the ability to look at that and say, "You know what? This change would not affect in any way accuracy and this change could. And this change is only going to affect, you know, a control on a particular entry screen." And if they can use some more intelligence with some guidance in the guidelines to do that, we can have the benefits of being able to allow us to get more changes into the field that we want to be able to make. And we want to make improvements that have been

identified and not store them all up every six months or every year or now maybe every two years because of the cost and the, you know, the whole involvement of having to recertify things.

So maybe that's a mechanism to do it, to be more -- very specific with the vendors on how to submit their changes and let the VSTLs know exactly how they can handle those changes.

DR. KING:

Okay. Brian I'm going to let you have the last word on this segment, but I wanted to see if I've captured your thoughts Bernie. And it's really something that's kind of extended across the whole morning which is there may be a need to change some of the balance of the specificity in the standard and more specificity on instructions, on procedural instructions to the vendors, to the labs and perhaps less specificity regarding the tension between performance or functional standards and design standards. Is that a fair summary?

MR. HIRSCH:

If you could state it again. I think I lost you halfway through there.

DR. KING:

I will -- you're like my students. You're not alone. The last comment that I heard you make was that there needs to be more detail in the instructions to the vendors about the particularly the de minimis process for making small changes to the system. And at the same time you said earlier that perhaps there's too much detail in some of the design criteria. And so I'm trying to make a general observation regarding the entire standard that maybe we need to go back and identify where more detail is needed for clarity and

where less detail may be more appropriate to not drive us towards
specific designs. I lost you again, I'm sorry.

MR. HIRSCH:

No, you didn't lose me. I think what I'm asking for is more structure
in order to submit changes, whether they're de minimis or not.
Some of these changes are important to our customers in terms of
maybe this is an upgrade, it's an enhancement, it's a feature that
they want, they want very badly and we would love to give it to
them. We should have a structure where we can do that at a
reasonable cost. And to do that at a reasonable cost I think if we
identify the changes that we're making and the anticipated effects
of those changes and if we have an independent review done of
that and if everyone knows the rules of the game, then we can get
these important changes into our customers' hands. Even if they,
you know, having to do a complete end-to-end test and a new
accuracy test and a volume test and all the stuff for something that
may just be a feature on one maintenance screen for, you know,
changing a candidate's name or something completely unrelated to
anything having to do with counting the ballots and all that, if that
could be identified clearly and if there's a way to get that in,
because right now in the 2005 standard you can't do that. If any
change is made to firmware or software, it's not a de minimis
change. Okay? And that's the standard that we're currently
certifying to. And I know we're going to have something in the
future that we're going to want to do and not have to go through a
very expensive retest.

DR. KING:

Okay, thank you. Ken, if you don't mind I think we need to move on to the next question. Maybe we can pick up your comments in the summary.

MR. CARBULLIDO:

Sure.

DR. KING:

Thank you. Matt could we go to the fifth question?

MR. HANCOCK:

Merle, can I?

DR. KING:

Hold it.

MR. HANCOCK:

Yes, I mean just in responding to that I think what I've heard mostly from this conversation is that maybe we need a roundtable on the certification program because all these comments really, to me, have nothing to do with the VVSG whatsoever unless we can bring it back to somehow a change in the conformance clause or something like that. And I'm not even sure that's relevant, you know. And certainly we're open to talking about the certification program in another venue, but I don't see how there's anything in the VVSG that specifically talks about de minimis change, Mark. I don't -- is there anything in there that...

MR. SKALL:

No, that's correct. And I just want to echo what Brian said. I mean the suggestions you had were all good suggestions, but I don't believe that that level of specificity for procedural requirements

belong in the VVSG. I think that's in Brian's things he sends out for certification procedure.

DR. KING:

Good, thank you. The fifth question, does the current draft of the VVSG create functional standards which permit vendors appropriate design freedom to innovate and implement, or is it a design standard that specifies how to build and implement voting systems that limit the freedom of the vendors? And I think I've heard this in some reflection earlier today and I think we heard it at the Austin discussion panel also.

There are always tensions in standards. Tensions between, if you will, the conservative nature of the standard of retaining functionality and of creating the flexibility to accommodate the customer requirements that we've heard, accommodate changes in legislation that are often very short fused. And a concern that I have heard expressed is that if we become too prescriptive in the standard we may be driving our voting technologies towards a single technology and perhaps even a single vendor. And I think Ken you had made elusions to the possibility that it may even be not a private sector vendor at some point in the future. So there's always been this observation about what is the right size for this industry. How many vendors can be supported well? How does it accommodate newcomers? And so the question that we pose to this group is does the current draft of the standard bias towards design specifications? Is it sufficiently articulate on performance or functional specifications? And are there areas that need to receive

more attention than others in review of the standard? And Ken I'll start with you.

MR. CARBULLIDO:

Okay. It's interesting, one man's requirement is the next man's design depending on your perspective.

But I'll give you an example I mentioned earlier where we believe the current draft is overly specific. We cite the requirement for embedded hardware Crypto-Module. This forces all existing devices to become immediately obsolete. It mandates a physical design rather than specifying the principles to be included and then allowing vendors to implement via appropriate methods. In this particular example we believe a software solution implementing the same concepts could suffice and would allow vendors to be more innovative, produce equipment at a lower cost and would not obsolete all devices potentially. That's a good example.

DR. KING:

Okay. Mark?

MR. SKALL:

Yes. And I want to get to the specifics of the VVSG but I just want to point out there's really three levels of ways one can specify requirements, not just two. Number one, it's functional. So what is a system supposed to do? The second is performance. What is it supposed to do and how well is it supposed to do it? Usually indicated by a benchmark. The third is design which prescribes a mechanism to do that.

The conflict is typically between performance and design requirements. There are quite a few functional requirements in the

standard that really don't affect this decision and I -- it's a very difficult decision. And I think like you were saying, one man's design is another man's performance requirement. So it's really a spectrum. And decisions were made.

The issue really is can you do performance requirements for everything? Most of the time when the TGDC chose to do design requirements it was because of I think one of two reasons. Either "A" they felt that this was a common design, which is typical for say usability issues. Texts must be this size, icons must be this far apart. Those are fairly common design requirements that are universally accepted. Some of the more difficult ones that you bring up, and I would agree with you that clearly crypto is more of a design requirement and I don't speak for why that was done, but I think in some cases if performance requirements cannot be done, if you can't come up with the metric, the benchmarks, well, then you're left with design requirements. So, you know, it's prerequisite. You have to be able to develop those good metrics. But I would agree with you that probably we need to take a closer look and see if some of those could be developed.

DR. KING:

Thank you, Mark. Greg?

MR. BEASLEY:

When you say you're going to take a look at that, does that mean that rather than specify a solution to a requirement, like the hardware module, you're going to just simply specify this is what we're trying to get that machine to do? We want -- in some kind of way we want -- this is the protection. This is the thing that we're

getting to. How you go about it is up to you. That's the innovation

part of it. You being -- I'm not saying "you," you know. The

specification at this point is very prescriptive about how you come

up with a solution and that's the element that -- If it's carried out to

the end, it's going to be incredibly disruptive to the voting

population in terms of cost of replacing all those machines. So if

we just -- if you just told us, "We want you to come up with a design

that satisfies this requirement and we will take a look at that and

then we'll pass that information onto the ITAs so they can validate

that it does what we're trying to get at."

MR. SKALL:

Yes, thanks. First of all let me just clarify we're not going to do

anything unilaterally at NIST. The procedure now is there are

comments on the draft VVSG and EAC will make the decision how

to proceed.

But to answer your question more specifically, we -- one of

the issues has been the so-called goal requirements in the VVSG.

Those of you who are at the EAC Standards Advisory Board know

that there's been a lot of heartburn over what they consider goal

requirements. One of the issues that we really need to concentrate

on is making sure requirements are testable. The one good thing

about design requirements they are testable and they're very

specific. And when you move on to, "This is what we'd like to

achieve and you can do it through a benchmark," great. If you can't

you're back to these goal requirements, which are really untestable.

So there's this tradeoff between specificity and testability in a

higher level and you really can't get to the higher level unless that level itself is specifically testable.

So I don't know that everything you're asking is doable in the sense that it's testable, but certainly I would think that during the comment period the EAC is going to take a look at this issue and see where they're headed.

DR. KING:

Okay, thank you. Matt let's move on to question six if we could, please. And Larry you had volunteered to make some prefacing comments about question number six. I'll go ahead and read the question for the benefit of the audience.

Are there any changes to the VVSG, in either scope or depth, which would significantly reduce the cost in time and/or expense of compliance without adversely affecting the integrity of the VVSG or the systems that are derived from its implementation?

MR. HOLMSTROM:

This -- that I semi-deleted out time and expense from my comments, so let's go to the next slide if we could Matt.

I believe that the scope of the standard should be expanded to the process of ensuring that the system accurately captures the voter intention, that auditability and indictability are added, election procedures are added and the processes of uncounting are fixed. Now there are some statements in the standard about uncounting the process of ensuring that all ballots are counted. Okay? I'm not producing -- I'm not going to suggest solutions but I've got a couple of slides that show some problems if we go to the next one Matt.

I believe we should very carefully identify errors. I don't know if everybody has had a chance to read this book but you should. This is the latest version of voting technologies and the first one I've looked at that actually has measured the error -- voter error rates as far as voting. Not equipment errors, but voter error rates. This study showed that a PCOS has about a 5 percent error rate and a DRE runs about 4.2. To translate that into a single vote with an average of 200 users of a DRE for example, that's a .5 percent error rate. There is data available from the Cuyahoga, Ohio, thing that showed some of the DRE error rates broke 7 percent. There's also data that I don't have the numbers here that there's probably as many errors caused by polling place workers as hackers going into the systems, and the last one is the whole uncounted capability where ballots are thrown away if they don't happen to hit the demographic of the partisan.

Let me just make a couple of comments. As I mentioned before, most of you here have tried to copy a floppy disc in your lifetime. I don't happen to have a floppy disc in my machine. Those four pages on the right-hand side are out of the original DOS manual of how to copy a floppy disc. There's 15 steps on four pages to do that. And today that's all done by a wizard where it guides you through the process. Remember we've got over a million polling place workers who are using these systems, most of which are not trained, are not computer literate. And I believe that the election procedure should be specified and a system specified in the standard that assists the voters in making errors, to avoiding errors, et cetera. And I believe the system is kind of moot. I

believe that the standard is moot as far as PCOS. A PCOS as defined by the standard does not provide any better verification which is fundamental to the system. It requires an interpretation of the voters attempt. I have at the bottom of the slide there a section out of a New York five-language PCOS ballot and I would ask you which one of those marks are accurate and correct, and it happened to be the lower left-hand one. All the others don't meet the standard, yet they're all very capable of -- a voter is capable of doing those. These probably move their self into the process of requiring a worse process of interpreting the intention of the voter through PCOS in the standard than we have with punch cards. The error rates in this book suggest that the PCOS error rates should range between three and 11 percent of capturing the voter's intent. And thirdly and lastly that the standard does not support an audit, it reports -- with PCOS it supports a recount. And recounts do not have an indictability capability. All I know is that counts don't match and you can't go back and fix it. So I guess I would suggest that the standard ought to be considered -- if we're going to talk about independent verification and/or software independence that we ought to extend it to the whole -- to the whole system.

Next slide if you would. I guess that's the last one. So I think there's some areas in the standard that -- the standard is focusing on hardware and a voting machine whereas reality voting is a system and there's a training aspect of untrained workers. There's a huge -- there's a million voters -- polling place workers that come and act twice a year, once a year and I believe that the standards do not address those things adequately. I think that as a

company like us who are trying to find a -- provide a full solution

that's wholly accurate where we're going after a single vote kind of

a thing, I think that the standard needs to be expanded to give us

some acceptance and some guidance to be able to do that. And

It's not just the ability for a scanner to read a mark.

DR. KING:

Okay, thank you. I guess one comment that I would like to make is,

and Brian help me if I don't get it quite right, is that some of the

operational issues have been addressed through the best practices

management -- election management guide. So I think there has

been effort in that regard.

MR. HOLMSTROM:

There has and perhaps those should be moved into the standard,

or parts of it, is what I'm suggesting. I think EAC has done a great

job of trying to identify much of those, but they perhaps should be

codified a bit more and moved into the standard or at least the

important ones.

DR. KING:

Okay, good. Thank you. Ken?

MR. CARBULLIDO:

I'll make a comment, if I could. I actually think the standard of this

next generation does a really good job of addressing the issue you

brought up. There are tests in there and benchmarks defined about

voter error rate and accuracy, so it does a good job of doing that.

Back to the question really of what could we change in the

VVSG in either scope or depth. I think a couple of things. We've

touched on them before. Removal of the requirement for the

hardware-based Crypto-Module, which again obsoletes everything, and maybe not if we can have a performance standard and maybe implement that in software. And then we talked about it before addressing the conformance clause absolutes. I think this standard really needs to be built and cannot be finalized without the policy decisions about the transition from today's, tomorrows and the next -- to this next standard. That needs to be done at the same time rather than later. I think the EAC should consider before you finalize the standard what does it mean, when is it effective, what's going to be allowed in parallel and whether this whole standard in entirety has to be a fail or a complete certification in its entirety. It's not a bad idea to say for example, "Use today's hardware but require the new standards accessibility performance requirements." That's not a bad solution for many jurisdictions around the country. We don't have to make the jump all the way across the Grand Canyon here. And so it's important that this standard gets defined in context of those policies at the same time.

DR. KING:

Okay, thank you Ken. I think I also heard you say a point that's been mentioned earlier which is, and Mark and Brian have both made it, about the certification in the standard making sure that the roles of those two processes are well understood.

MR. CARBULLIDO:

Yes, but I guess the point here I'm making is it's -- I believe it's the conformance clause that you change in this standard is the place to address and dovetail with the EAC policy more than anything. So if there's a change here that allows us to make -- to this standard,

that's I believe where it needs to be. Remove some of the design prescription, but there should be a good conversation about the grandfathering or not or the transition or two standards in effect for a duration. And I think the conformance clause may be the only place here where that kind of thing can dovetail. Okay?

DR. KING:

Okay. Tab, go ahead.

MR. IREDALE:

I'll just try to address the specific issue here of what things we can change in the standards that would probably reduce certification costs without really affecting the integrity of the system.

One of the things I noticed the standard has done a very good of differentiating between what they define as a module, what they define as a callable unit which has been an issue in traditional standards. However, this standard is still requesting a lot of information being provided at the callable unit level. And as you go to a more modern language where everything is done through an interface and done through, you know, you have no public members, everything is done through a get-set type or get-put type interface, having to document each and every one of those to the level that the standard is actually requesting is really a very time consuming thing to do, to review and does not really provide any additional information. It actually starts to hide and bury the important information amongst pages and pages of fairly irrelevant and trivial information.

So we really need to define a better way to get into the TDPs what is critical, what's important and be able to eliminate from it all the stuff that's fairly irrelevant and trivial.

DR. KING:

Thank you. Ken is your sign up or...

MR. CARBULLIDO:

It is but it is no longer.

DR. KING:

Okay. I wanted to ask a follow-up question that Ken I think you hinted at in your response and that is the status of the 2005 VVSG vis-a-vis the 2007. Is the vendor community in a wait-and-see mode on the 2007? Or are we moving forward with 2005 certification plans? And is there a sense of what may be going on in the industry that could be shared here? Bernie is quick on the draw, and then Greg.

MR. HIRSCH:

The sense that I'm getting, and keep in mind I sit in a little room doing programming most of the time but I do hear from my co-workers, the sense I'm getting is that people are withholding purchasing decisions because of the continual introduction of new standards. And as long as those standards are not set in stone and as long as there's every two or three years a new set, everyone is just going to sort of wait and see. And that's the state of affairs.

DR. KING:

And "everyone" is both customers and vendors?

MR. HIRSCH:

I think the vendors just want something that they can design to. Our development time is now at a minimum two years and probably closer to four to get something to market knowing that we have to spend time designing, developing, producing, certifying. It's a long cycle.

And so we, you know, there's this feeling like we went -- personally MicroVote went to the 2005 standards and it's disconcerting to think that almost as soon as we're done certifying to those that there will be this new set. And you've called them at the beginning of this whole thing "voluntary." Make there no mistake, it's not voluntary if you want to do business in this country because many of the jurisdictions have said it's not voluntary. So even -- and even if in some places it is there's the perception that having that voluntary certification makes your system better, whether or not it actually is better.

So I think what's happened is by us introducing more instability into the industry, into the voting systems of this country we are delaying decisions. We're delaying improvements. We're delaying everything and it's put sort of the whole kabash over the system. And I just -- I wish we would come up with a firm set of standards that are in place for awhile. At least as long as our development cycle, that would be nice. And right now we're not doing that.

DR. KING:

Okay, good. Greg about one minute and Ed about one minute if we could. Greg?

MR. BEASLEY:

There's no question about as to whether or not decisions are made as a function of when the EAC comes out with a new guideline. And so what is it -- that's the obvious. What is it that we can do about it? The things that we are suggesting that we do is for one thing standards certainly have to come out to address new technology and new threats that exist in the world in terms of hacking a machine, having access to a voting machine and things that you can do to compromise a vote. So new technologies and new applications certainly have to continue to be employed in terms of a testing document.

What we are suggesting is that here we went from '90 -- 1990 to 2002, 2005 and had things gone according to plan apparently in 2007. So if we have a standard, let's say in 2010 when we finally get this -- "we" the EAC and the Commissioners and everyone involved -- get this done, if we just have a process by which here's the standard and now the Attorney General's Offices, the Secretary of State's Offices, the county executives they look at this and they say, "Okay, well, I can go ahead and make a decision because I'm pretty sure we're not going to have to change our law or modify the thing that we use to determine whether or not we're going to buy a machine because we know that it's not going to change for another five years," or something to that effect. And even if they did change the change is not going to require the manufacturer to go through an incredible amount of money and time to comply to that new standard.

So I'm very happy to hear what Brian was talking about yesterday in terms of the EAC working with several states to help

get the entire matter of certification at the federal and state level

somewhat unified, I guess it's similar to that old NASED state

program.

MR. HANCOCK:

Better. Much better.

MR. BEASLEY:

Absolutely. So like I said before, I think the EAC is doing a very

good job and an awesome task, and we manufacturers realize this

is something that's being developed. So I'm saying that the

decisions are clearly made based on when a standard is going to

come out. We, the manufacturers, have to decide, okay, am I

going to wait to get this certified to 2007 or go and just deal with

2005? So it's very important as to when a standard comes out and

to the extent that we have to comply with it.

DR. KING:

Thank you, Greg. Ed, last word on this.

MR. SMITH:

I'll try to be brief but, you know, the market is paralyzed by factors

outside of the EAC's control as well. When I go out and speak to

customers or when I go out to speak to states and then take their

viewpoints of their jurisdictions, HAVA fulfillment -- I mean the

market has some degree of saturation, although there's plenty of

unspent dollars out there. Some of us were speaking the other day

that you look at as it's Los Angeles and it's New York and places

that are well known and defined as not having HAVA compliance at

this point in time. HR-811 and some of the subsequent bills to that

and some of the companion bills that came out when it was first

published create confusion and thus paralysis of purchasing decisions by jurisdictions that Sequoia currently has or is targeting.

The VVSG publication dates contribute as well. And one of the things that I fear is that with the VVSG continuing to move out perhaps in its publication dates certification cycles under the current scheme of taking longer than anybody would like, including the EAC I think, there is an opportunity to get to a critical point in one state, or in many states perhaps, where they jump out of the system which is amenable to both the EAC's goals and I think the goals of the vendor base where instead of having a nice coalesced federal certification program you have 50 different little state programs with all of their little different requirements and it just becomes impossible for us as manufacturers to navigate through that very diffuse line of certification.

DR. KING:

A very good observation. We've got one remaining question and Matt if you would put up question number seven. This is the last question and in some ways we've already addressed this throughout the morning, which was how would the 2007 VVSG impact the time-to-market for vendors? And I think we've already talked about some of the components that would add to the time, perhaps some components that could be modified that would improve the time-to-market.

But what I would hope is that maybe each vendor here at the table if it's a metric that you have confidence in could share with us what you perceive as time-to-market. And I think Bernie you've already made some reference in years of time-to-market for

product. That may be helpful for the EAC and for the rest of the people in the audience to understand the development life cycle of a product and how the VVSG may impact on that. So Greg I think you've got your flag up. Or is that leftover? Ed?

MR. SMITH:

I'll put mine back.

DR. KING:

Go ahead, Ed.

MR. SMITH:

At this point in time we look at within Sequoia several months to develop a major release, you know, in basically a year or so timeframe. And we're seeing with having made initial submittals to our VSTL back in May of '07 obviously over a year to get to an EAC number and probably thereabouts to get to at least the VSTL.

Just to report, under the new VVSG, whenever it is ratified and published, the VSTLs are going to be tasked with hiring or contracting a very different skill set and higher caliber of persons to help with the accessibility and usability interpretations, the vendors their use of usability and accessibility contractors to help design the systems, test the systems, ensure that it's going to pass the benchmarks that are in the VVSG, proofing out the logic in the code, looking at the code, making decisions, deriving the new test methods and such. So even after the VVSG is published I feel it would be some months before the labs are able to intake the new systems, regardless of how long it takes the vendors around this table to design, develop and make them ready for submittal.

There are several things in the VVSG that concern me because they imply a process when it goes to the EAC and the VSTLs for actual development of the testing certification process that will have to be run in serial rather than in parallel. For instance your open-ended vulnerability testing you would want that to work again after you have incorporated and believe you would have passed the usability and accessibility pieces because those could create changes to your code which would then invalidate your open-ended vulnerability testing. Your spider web analogy comes to mind there as very accurate for this piece of the argument. The FIPS compliance depending on how you define it. If you define your device as a cryptographic module, your voting machine perhaps rather than just components inside of it that are shrink-wrapped applications or store-bought components, could cause some real problems because you would have to get that FIPS verified.

You're shaking your head no. No because you believe me or no because you don't believe me?

MR. IREDALE:

I'm scared.

MR. SMITH:

Tab is scared. I'm concerned too. There are many things like that that do exacerbate the time-to-market from the vendors that are structurally inherent to the VVSG. And I think that as we go forward through public comment and working with NIST and the EAC that they be -- tell a logic about it and think through these various clusters of requirements when put together can't chart out like this

in a VSTL process so that where possible items can be combined or made to where they do not have to be performed in serial but rather in parallel or even overlapping to decrease the time spent getting things certified.

One of those barriers to entry that Kevin spoke of earlier that are keeping people -- or new entities out of the market is the time and the charges to pay for the VSTL work. And when it's in parallel -- every month that you're in is another month of costs to the VSTL and opportunity costs of lost sales.

DR. KING:

Good. Thank you, Ed. Andy and then Ken.

MR. ROGERS:

Obviously there is much more in this new standard that is required of us and of the VSTL, and so from that point of view we will have greater time-to-market. There's no question there.

Another facet of that that I think is important to mention though is that because of issues of the higher costs, higher investment that is required and the confusion among customers out there that will lead to, as we've said, delay of potential purchase of new systems.

Another factor related to time-to-market is that we as vendors will be making choices about how often we make releases. And I think Bernie said something up to, you know, two years or some comment like that earlier today. That's a reality that is a side effect of changing the standard and adding so much more is that even if we could do it at a faster pace, and we desire to do it because we'd have those customer features that we want to

change, if -- we're going to tend to want to lump things together so that we can pay for that as a lump at one time.

DR. KING:

Okay. So just to summarize Andy, the normal practice of issuing releases will be driven in part by the cost and time function of the standard rather than by customer needs or other issues?

MR. ROGERS:

Correct. So thinking of it as fixed and variable costs, the higher the fixed cost the more we want to pack in and spread that cost over more value for the customer.

DR. KING:

Great. Ken?

MR. CARBULLIDO:

You asked about time. I think it's a two to four-year process to build, certify, have the labs get ready to certify and then address the market, the sales cycle. The training cycle for the new technology is going to elongate getting that to market. It's a two to four year cycle and hopefully if it lands on an odd year rather than an even year, because if it's an even year then it's going to be a six-year cycle, so it's a long time.

We've talked about the reasons. I think -- we've talked about the freezing of the marketplace. That's going to happen. It is happening. There is a question here about what could we change. I'll add to Talbot's earlier suggestion. We could reduce the requirement for such extensive documentation. We are finding ourselves creating more documentation, spending time building more documents than building systems. We are writing so much

documentation nobody can read it. Every -- both the federal and the state level everybody wants use documentation and there's lots of different ways to use systems, and many down to local practices. So it's getting impossible to document everything in every way.

There are -- with modern systems that are built in an intuitive manner then the user documentation can be minimized. If software is being built modularly and logically, then the requirement to externally describe the software design in such detail can be minimized. That kind of documentation that's never read anyway is a waste of time and cost, and the amount of documentation being asked for in this standard is growing and the value is really questionable.

So that would be one recommendation we would make.

DR. KING:

Okay. Jim?

MR. KAPSIS:

Thank you. The impact of the 2007 we think would be first based on what the 2007 is going to determine. If it's going to make existing 2005 equipment obsolete, then there is a timeframe in which manufactures have to go back to the drawing board and start all over again. If it's going to allow a flexibility with regard to conforming or expanding on the 2005, as the 2005 has done with the 2002, you know, development and deployment of that particular system could be enhanced dramatically.

DR. KING:

Good, thank you. Okay, well we are within four minutes of our goal, which I very much appreciate not only the contributions but the discipline contributions that have let us stay on schedule.

For the rest of the day our schedule is we're going to take a lunch break until 1 p.m., and when we return from lunch each member of the panel will have an opportunity to either come back and highlight comments they made earlier that they want to make sure are on the record and driven home and to make a summary statement to kind of wrap your company's viewpoint into whole cloth and put your comments into a larger context. So when we come back from lunch if you've not already thought about a summary statement, we'll be giving about four minutes each and that will let us all get it done without about an hour or so.

With that, let's adjourn until 1 p.m. and meet back here hopefully right at 1 p.m. Thank you.

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[Luncheon recess from 12:02 p.m. until 1:05 p.m.]

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DR. KING:

Okay, thank you very much. Welcome back. And just to kind of recap where we are and our plans for the remainder of this session, we are going to be finished by 2 o'clock. That's my commitment to all of you, particularly those who have flights. And we want to create enough time for each member of the panel to make sure that the selling points of their firm's perspective on the VVSG issue are stated here at this panel.

At the very beginning today we talked about the importance of gaining insight into the various viewpoints into the approval and the implementation of the VVSG. The vendors have a very, very important role and it's a role quite honestly that I don't think is well understood in the jurisdiction community, much less the wider community of voters in the United States. So I personally appreciate the candor and the input that I've heard here today, and I think when we reflect back on some of the comments that were made today they're going to be very useful. But we want to make sure as we go through our final conclusion today that we work towards our goal which is developing a workable, implementable standard that produces better systems.

And to that end what I'd like to do now is to ask each of the representatives of the vendors to make a summary statement into the record if they wish and at the very end we're going to close up with Brian and myself. And with that end, Larry I'd like to start in your direction if we could and we'll just wind around the table like this. And if you see me hold up my finger it means you've got about one minute left and please move towards the conclusion.

Thank you.

MR. HOLMSTROM:

Okay, well my comments are really simple. I believe first place I like the new standard, just to let you know. I think it's got a great process to fixing most of the problems I'm aware of with the existing systems.

Number two, I believe every vote should count, should be accurate to one vote. And the discussions I've heard that we're

compromising or, well, we're good enough, or we're better than the aircraft, et cetera, is unacceptable to the public. I want my vote to count and if there's an error I want it to be your vote, not mine.

We applaud the whole notion of independent verification and software independence. And I like what you're doing. I do believe however that you need to get -- the system needs to have the ability to grade and be certified against certain parts of the standard so it's not a pass/fail, it's a 98 percent or a 50 percent. For example, I don't think it's an absolute mandatory requirement of equal importance that a system runs two hours or one hour and 30 minutes versus being able to handle an under-vote. And so I think that there needs to be some grading of requirements and I think things need to be -- the ability to certify against portions of the standard. And obviously I think he who certifies the most is the best, but I don't think it's a pass/fail environment. I think the standard is far too complex for a simple pass/fail kind of things.

That's all I have to say.

DR. KING:

Okay, thank you very much Larry.

MR. HOLMSTROM

You bet.

DR. KING:

Ken?

MR. CARBULLIDO:

The first thing I'll say, and I'll repeat what I said earlier when we first opened, I think this is a well formed, good structured document and a great starting point. And as anyone would expect with something

this large there's some minor things and details we can work through, and that's the comment period and that's good and we'll get that all ironed out.

Yet at the same time I'll say there's maybe four major concepts that I'd like to touch on that need addressing in the big picture. The first, and I don't think we spoke about it much except to talk about the innovation class in software independence. We've not debated the value of software independence and dependence on software. ES&S disagrees with the concept that software cannot be trusted. This concept is -- says that software cannot be trusted so any system is insufficient if there's dependence on software and no other mechanisms besides the software for auditing or counting purposes. This precept implies that no matter how much testing, validation, inspection, management or control a system relying on software cannot be trusted. We disagree with this concept and this belief. There are many industries, government departments that rely on a single person or a team of trusted individuals to set up and run crucial components, and I believe there's a way to do that in this industry as well.

The second point I'd like to make is that just to reiterate again that the policy with regards to this standard, the relation and context of this VVSG and how it's going to be used needs to be made at the same time, not one after the other. If this gets set in stone, then it forces the policies -- let's say it reduces the policy options if the VVSG gets set in stone first before the policies are made. And I think those discussions have to happen and roll out at

the same time. Some of those policies may change such things as the conformance clause here, which is my third point.

Whether it's a conformance clause or the ongoing aging and maintenance process of this standard, it shouldn't be every two years, every ten years. It should be the fact that we can make some changes that are goodness, lessons from learned from running elections, don't need to wait six years before we apply those lessons. I think the maintenance process and it should -- there can be one created where it doesn't stop certifications or invalidate in-progress certifications. We just need to have revisions of this that are allowable and anything in the process of being tested can be certified against a January 1st set of revisions even though in February and March there's more revisions. There's nothing wrong with something like that. So I think the context, aging, the grandfathering, the maintenance of this is as important as the standard. Nothing ever was built perfect the first time, so we should not believe that this is going to ever have a bow tie on it and be done. But at the same time we shouldn't try to make a mountain every time we try to move forward.

And the last thing, we've heard it in other roundtables, is the financial impact of these changes, the financial impact of these requirements. A lot of this, let's say, that's missing. When we ask for some things in the standard, does anybody really know what they're asking for and whether we can all bear that? We all want perfect systems. We can have perfect systems with a combination of technology and people processes. And I think before standards

are set an analysis of the financial and operational impact of such

standards should be made before they are set in stone.

And those are my final words, thank you.

DR. KING:

Thank you, Ken. Greg?

MR. BEASLEY:

Thank you, Merle. Actually let me start by thanking Brian, Matt and

all of the EAC members and the Commissioners for giving some

thought to listening to our proposals. I'm persuaded that you shall

give our thoughts all the considerations that they are due.

So let me just briefly go over some of the things in terms of

AVANTE is concerned that we would like you to consider when you

-- as you finalize the VVSG. The first thing has to deal with the 17-

025, which I realize is not necessarily a function of the -- directly

related to the VVSG. However, it does have an impact on a

manufacturer submitting a product to a test lab and getting that

product evaluated accurately and fairly and competently based on

the guidelines. So if an ITA has one person that's uniquely

qualified to do some testing and then they hire 12 or 15 different

contractors to come in and start testing against these incredibly

demanding standards, it presents a problem in terms of the time it

takes for the certification process to be completed. It has bearings

on how well the -- it's one thing for me to say, "Okay, I think you

comply to the standards based on my understanding and

interpretation of the standards." "You" being an ITA, an

independent testing authority or a VSTL. It's another thing for that

person to be well trained and have a very good understanding of

what they're supposed to be testing to. So I know that Brian
Hancock has been giving this a lot of thought and so I appreciate
that element of it.

The next thing is the open-ended vulnerability testing. When
you try to -- when you try to -- when I try to inject something that
covers multiple variables, that by nature makes it incredibly broad.
So it's almost like when Paul was running around Damascus or
some place and he found this place that had a statute to an
Unknown God. Well, that's what we have. That's what this open-
vulnerability testing is. It's a statute to an unknown variable. I don't
think it should be in the VVSG. I think the VVSG should be as
prescriptive as possible so there's no subjectivity, there's not a lot
of interpretation that either the ITA can make or the EAC as far as
that is concerned. So I think that model perhaps should be
revisited in terms of being an inclusion into the VVSG.

Like Larry mentioned, we at AVANTE absolutely believe that
statistics that apply to one industry does not necessarily apply to
another. If I said only one percent of machines fail, that's quite
different than saying one percent of airplanes fail. There's no --
that's apples and oranges. So we really believe that every vote
does count. As a matter of fact our motto is EVC. That's what it
stands for, every vote counts. So we believe every vote should
count to the extent that we can have as -- we can be accurate and
honest about a vote.

Now the independent verification, I would like to see to the
extent possible the VVSG be a little more unambiguous about what
that means. In my opinion there's a lot of room for interpretation of

what it means to be able to independently verify that -- what the voter did. If you use the machine to verify itself, it's quite akin to having the fox tell you how many chickens are in the hen house or whatever. We -- I'm saying that we should have an absolutely independent method of looking at that vote especially for a voter that has a vision problem. How do they know that the machine did what they told it to do? And if you use the machine to tell you that, to me it's not independent. So we could tighten up on that.

Number five I think we would -- I would like for us to consider -- you guys to consider -- or as we say in New Jersey yous guys to consider -- allowing a machine to have multiple standards in the certification process. I think we already discussed this a little bit, I'm just summarizing it, to have the hardware for example part of it be subject to the 2005 standard and then the software element of the same system be certified with an EAC number to the 2007 standard. So the multi-tier certification standard process.

Number six I would like to -- and we can help. We, the manufacturers, can help with this -- reduce the preponderance of documentation that we have to provide.

Number seven, we would like to have a broader method of making de minimis changes. I think Ed mentioned this before that if a customer asks us to simply eliminate one screen because it's not needed for a poll worker, clearly most people that have some degree of understanding can look at that code and say, "Oh yeah, that has nothing to do with the rest of the system. We're not going to force you to do a source code review, regression testing," those kind of things because it absolutely makes -- it's clear that it has no

bearing on any other thing other than just eliminating that screen. So we would like to be able to make some changes under the de minimis program without going through several thousand dollars to get that approval.

Thank you.

DR. KING:

Thank you, Greg. Ed?

MR. SMITH:

The new VVSG iteration is a far more rigorous and scientific document as one that people involved at NIST and the various boards should be very proud of. It certainly will require a higher level of rigor and science out of our respective development communities and the manufacturers' world, and ultimately I think it will provide a higher level of performance from our products built to that standard. We think it actually will also create a higher opinion of voting systems in the mind of the public and quell some of the advocates, their commentary that is sometimes, you know, sometimes it's accurate and sometimes it's spurious to say the least.

But standards are not written and implemented in a vacuum. When the standard is ratified -- or the guidelines, I'm sorry, is ratified -- or are ratified what they contain, how they're interpreted, how it can or cannot be fully tested, all of those will have an effect on its acceptance, not only by the community represented here today, the manufacturers, but by the jurisdictions and by the public that I mentioned earlier.

Counties will be using the same systems this year for the most part that they used as far back as 2006 and maybe even prior to that. And those are changes in the certification process. And one of the things here today we've kind of mixed at times the certification process and the VVSG process, and we should keep those two concepts separate because they in fact are separate.

But equipment purchases are stalled due to some of the reasons we've talked about today both those -- or those reasons are both associated with and disassociated with the VVSG authoring and ratification cycle and the certification cycle.

Two more points. One to build on Ken's concept of trustable software and, of course, combined with hardware make a system. We at Sequoia looking at the draft guidelines believe that there's both an attempt to create or espouse the software independence concept that was voiced during its authoring but also to make the voting systems a trustable or trusted environment. And some of the questions we ask is -- or are if you are software independent, if you have software independence, if that's even a plausible concept, then why do you have to have trustable systems? Why all this other stuff that you have to do associated with security? The usability, the accessibility, the movements there, you know, certainly are well founded and we certainly believe that everyone should get an opportunity to vote and every vote should count, as Greg mentioned earlier. But it seems like we want to have both and that appears to us to be a very costly and perhaps duplicative approach within the standard.

In closing, Sequoia would like for the ratification process to continue to be collaborative, as we've heard with these roundtables coming up, and of course today's roundtable. We also think buried within that should be a cost benefit analysis with concise and, I'll call it, explainability to the various constituents of the larger voting community, the public of course who we're all here to serve, but the jurisdictions, government at all levels including this agency and the other related agencies, to understand what this is gaining and at what cost to the taxpayers, to the jurisdictions who like we've discussed today will bear a higher burden, a higher tactical burden to deploy and perform an election. What does that look like relative to the benefits from procuring a system to this new guideline?

Thank you.

DR. KING:

Thank you. Tab?

MR. IREDALE:

I also would like to thank the EAC and NIST for a great effort at this draft standard. It is very encompassing, well structured, well organized and will definitely lead to a much easier product development life cycle for us. Again when coming to -- going to certification hopefully because of the structure of the standard it will definitely, I believe, make it easier for us to proceed with certification.

I'm going to reiterate a few comments that have been made here already. And one of them -- to me one of the most important things for us to proceed with, and it's been mentioned both in terms of the standard and in terms of the EAC procedures, and that is an

ability to either phase in this standard or bring it where there's a big overlap. But there are going to be many facets of this new standard that are very, very worthwhile to implement whereas there may be other facets that are impossible to implement on existing equipment and we should not have a take-all-or-none approach. For those systems, for those counties or jurisdictions that have already bought equipment and don't have the resources to enhance or buy new equipment, it would be really worthwhile for them to be able to upgrade and get the benefits of this standard in the areas that they can afford. And that's a very, very important concept for us to try and develop whether it's, as has been mentioned, on a level or a rated or an ability just to have parallel standards going. That I think is very, very important.

The second aspect is, as has already been commented, a cost analysis. There are, you know, many, many great ideas in the standard. Improving security, improving robustness, improving usability are all fantastic ideas. The question becomes at what point does the cost of those improvements make the system no longer viable? And I'm not just talking about financial costs, that is one aspect, but usability for poll workers, for election managers and election administrators deploying their system. As we increase security we also increase complexity and we will do what's possible to minimize that but at some point it will probably exceed the benefit. And so that's definitely something that's missing in the standard. It's great to say, "Hey I want a Rolls-Royce," but if you don't have the money to fund it it's not going to be a viable solution.

The third aspect, and this is just definitely a little more specific in terms of the standards, we've mentioned it a couple of times this afternoon and this morning, dealing with the TDP and how to simplify the thousands upon thousands of pages of documentation that's being required of marginal use. Yes, I believe that there's some things we can do in the standard to actually improve the TDP, improve the data that's being provided from the vendor to the testing authorities and through some fairly simple changes in the standards in terms of some of the details that is being requested. I believe that it's very important for clearer, high level design documents be prepared. Whether we need to get down to the very, very nit-picky details of individual functions, I'm not -- I do not believe that that's really necessary. When a reviewer is reviewing the system and they have some questions of both how things work, I think it would be worthwhile at that point for them to turn around and say, "Hey, we would like some more information on this area" rather than taking a broad-based approach what is like a shotgun across the board. It consumes a lot of time and is giving us very little return.

Okay? So those are my comments. I appreciate being able to attend this and for us to be able to provide comment. Thank you.

DR. KING:

Good. Thank you, Tab. Jim?

MR. KAPSIS:

I think I share with the whole panel that the document that was submitted to us for review certainly has a number of interesting and provocative aspects to it.

Basically we at Precise Voting are new into the voting area. Our development was within a two-year period and we are, we think, in compliance with the VVSG 2005. We intend to go to market on the VVSG 2005. As the 2005 was developed, it obviously was developed because there was specific scenarios around the 2002 and those scenarios were based on either problematic or certain failures or human errors and things of that nature. And they were addressed by this Commission and they were addressed in the VVSG 2005 for what was called an on-site experience. I believe that the 2007 requires an on-site experience. I believe that the 2005 VVSG compliant units should be put into the field. I believe that before determinations are made on the 2007 VVSG we need to see the actuality of this human error and this actuality of any existing or continuing problems that were not addressed under the VVSG 2005 specifications. I think it's an important factor.

Economy is a major factor. Having the VVSGs obsolete equipment is not economical. It certainly would be counterproductive to moving forward in the voting industry. We can quote a number of statistics from airplanes to cookies. I mean, you know, where you want to go with this it is up to, you know, the individual. Basically we all have a compliance agenda and that is to make sure that the security of our system produces every vote, not a possible every vote. And I think that's what we're all striving to get to and I think all the manufacturers here have done that or at least have tried -- strive to get there. I understand that the concept of rigid enforcement is necessary because of the past problems. I

think that it's necessary and -- but I think it has to be examined from the street. It has to be examined from the actual equipment being put into the street. And then I believe that determinations could be made that are valid and economical.

And I thank you for inviting us to this once again.

DR. KING:

Very good. Thank you, Jim. Andy?

MR. ROGERS:

The value of a standard, I'd like to point out is, realized when that standard is implemented. And so kind of a chain of logic that I'd like to leave the group with today is that you've heard lots of comments about how the new VVSG will cause a lot higher costs both for the vendor, for our customers in both developing the product and in implementing the solutions. And when we combine that fact with the current environment at our customer sites where they are weary of the changes that have happened at the federal and state and local levels over the past several years, those things combined to make it unlikely for, in the near term at least, our customers to want to make additional changes and therefore makes it unlikely that vendors, as we've mentioned here today, will want to invest more in to making innovations that we all may desire.

So as we go through and continue the work on this standard and get it towards a final conclusion, what we recommend is to think about those sorts of ultimate benefits and work, as we've suggested here in some of these questions, to reducing the costs of the standard by keeping it simple, by being aware where there are duplicated requirements and clarifying things so that we can reduce

those costs and therefore have the implementation of the standard and its benefits happen earlier rather than later.

So we at Hart, like the others here at the panel, very much applaud the TGDC and the EAC for the improvements in this standard. We are also very excited about the announcement that the EAC will be pursuing a threat model. We think that's long overdue and we're very happy about that. And we are also very happy to have participated in this event and look forward to doing more. Thanks.

DR. KING:

Good. Thank you, Andy. James?

MR. HOOVER:

First of all, I join everyone else in thanking you guys for having the venue and for putting in the time and for giving us an opportunity to share our concerns and again -- and to NIST and the writers of the VVSG the next generation. Again I echo what you've already heard is that I think it's an excellent starting point as a document. For those of us who live and breathe those documents, like probably few people do, it's very nice to see the clarity and the organization of thought because some people may only read them once or twice but for those of us who our job is to go through each of those things on a daily basis it's going to be a tremendous assistance for sure.

Now I mean there's -- obviously there's an opportunity for us to submit our comments through the formal means and I think for the most part most of it's been covered here by the people that have gone before. In general I think even though there are issues and areas in the document which are causing concern, 95 percent

of it I think is looked at favorably and as the way to move forward. And I think that's an excellent start because the work and the effort and the discussions that have to go in to get agreement on some of those large concepts I understand would take a huge amount of effort and a lot of discussion. And the fact that they are so good is commendable.

Now without going into the details, I don't know if when I look at this I thought we had -- on several items we had a fairly philosophical discussion on what are the important issues behind the VVSG, not potentially on what are the specific parts in the standard which are an issue, but some of the over-arching principles that are in there. And there were a few that I think brought some concerns from the vendors. One of them, reiterating Ed's comment on the cost benefits analysis, the value of the open-ended vulnerability testing, concerns about software independence and concerns about if you had a system with the new guidelines there would be implications on usability.

I share the concern with all of the people who have brought those up, that those are serious issues to us not only on the systems that we are going to be looking at developing but if we do we may have -- we may be able to satisfy some of the vulnerability testing with decreased usability, and for us that's a serious issue that we think is going to remain on the forefront. So it may have come up here for the first time, but I believe this will be one of -- perhaps those four things might be -- that might be the main concern in my job for the next two years, how to do that and do it successfully after being given the challenge of the new guidelines.

That's pretty much all I'll say. I won't reiterate on what other people have said. But I guess we've talked about the new guidelines and I think the next step perhaps is to discuss the EAC procedures surrounding the new guidelines. I think there's a lot of comments and issues if we're going to use those guidelines, when we're going to use those guidelines how does the testing manual and how do all the procedures change with it. So if there's an opportunity in the future to have those kinds of discussions, then we'll be looking forward to it.

DR. KING:

Thank you, James. Mark?

MR. SKALL:

Thank you. Also I think this is a great discussion. I think we really benefit by hearing what you guys have to say. You guys are crucial to the process. I think these were really good comments. I, in most part, agree with just about what everyone said at the high level with some tweaks, which is very rare for me. So I think it's really a good discussion. Great points. We have to, you know, get through these. So I do want to thank Brian and Matt for setting this up and Merle for hosting it.

So getting into a few specific things. I guess I heard -- well, it's interesting that there wasn't a question on software independence, it's value, but it sort of crept into the summary. So I heard first of all that you disagree with the fact that software can't be trusted and I guess you see that as the main reason for software independence. And I guess Ronald Reagan said that "trust but verify" I think is the key. The issue is not really trust here at all.

The issue is the inability to prove software correct. I mean we all

know that no matter how well you do your job there are going to be

bugs because you can't prove software is correct. And the

question is what happens when those bugs are introduced? In

other areas there are receipts where you can trace your

transaction. Here there is no receipt and you don't know when a

bug has been introduced. You don't even know there's a problem.

There's other industries, like the airline industry, that has backups.

Software independence is essentially your back-up system. It is

not a substitute for software correctness. I heard that argument as

well. You do your best to get everything working correctly.

Software independence, and I've heard this analogy, I think it came

from the last roundtable, is kind of the parachute. That's the back-

up system. When the airplane's systems all fail, you have some

way to get out of it.

A couple of the specific issues. Open-ended vulnerability

testing, I think the one thing that -- there are some concerns with

that that I think the TGDC and NIST has as well. We think it's

necessary but there are some challenges. The challenges are how

to do that. To me, and I haven't heard this mentioned or if I did it

was very brief, is how do you do this consistently across all test

laboratories? We want to have a level playing field. One of the

things we're doing at NIST is developing tests and putting them in

the public domain, giving them to the test labs so everyone gets

tested to the same test. That is difficult to do in open-ended

vulnerability testing when you're relying on people. To me that's

the big challenge there.

I want to clarify the issue about the innovation class and its relationship to software independence. In the sense that everything in the VVGS wants to be software independent, yes, it is true the innovation class must be software independent as must everything else. So all the accessibility requirements, all the requirements must be software independent. However that's different than I think the discussion we were having which is that software independence -- that the innovation class was put in only as a way to come up with a software independent approach to a non-paper solution. That is not the issue. So you can have different solutions in the innovation class. Yes, they have to be software independent but they can address things like accessibility, programming languages. Anything you want can go there. But like everything else, everything must be software independent.

Lastly I just want to sum up by saying I heard really good concerns coming from around the table. I believe everyone feels that the requirements in the VVSG are fairly good and I believe we cannot -- and it's very dangerous to back off on those. Just because we all have valid concerns about how to implement them and how much they cost, that doesn't mean we should throw away requirements. That would be the wrong thing to do. I can wear different hats here and say, you know, I believe these things should be here. We need to make our system secure, accessible, auditable. But if I was a voting official I would worry about how to do this in a way that I can afford not to break the bank. But again the answer is not to take requirements out.

So I think we have to find some compromise solution, and we talked about some of those. Perhaps a tiered approach, grandfathering. The challenge is to make sure we preserve the requirements we have that are in there to meet the requirements of HAVA and the requirements we all feel are good in a way that it can be done in a practical way. And I think we need to brainstorm that. The answer is not obvious. There are some potential solutions, but I think there needs to be forums and a lot of discussions so we can reach that conclusion without just throwing away very valid requirements.

Thank you.

DR. KING:

Thank you, Mark. Brian?

MR. HANCOCK:

Thank you, Merle. I just want to reiterate on behalf of our Commissioners and our Executive Director I'm going to thank you all again for being here and spending your time with us today and giving us your insight into this document. We certainly will take it into account and we do feel that it's very valuable. We need to hear from you all and hope to continue hearing from you all.

I also would like to reiterate things I said earlier just to keep it in front of everybody's -- to the frontal lobe there. We are extending the public comment period. We do want to hear from you. And just to reiterate the fact that the new closing date for this public comment period will be May 5th, 2008. And also just to remind folks that our good friends, the test labs who have been sitting in today, we'll be doing our next roundtable discussion with them and

focusing on their role in the process in Denver on March 19th of this year. So we're looking forward to that. See you in Denver.

And just again want to thank Merle. He's done a great job again as usual and I think you have a budding new career as a professional moderator perhaps if you ever want to leave the academic field.

DR. KING:

Well, as my students say if you only had four hours to live let it be in one of Professor King's class because there time stands still. So I do appreciate that.

We will get out of here early today, five minutes early, but I want to take an opportunity to summarize some of the things I heard here today, and it's important because it's a way for me to acknowledge that I really got a lot out of this. I listened. I heard some things for the first time today. And I think some of you brought forth well-established themes that have been discussed before and some of you planted some new seeds. And on the new seeds concept, it's very important that you follow-up with written comments to the EAC because that will give them an opportunity to come back and see the whole cloth of the concept that may have been introduced here today.

But let me, if I can, kind of summarize what I heard today as what I thought were the high water marks. First some consideration should be given to the VVSG standard for options, perhaps less than a hundred percent conformance to the entire standard. That additional work needs to be done to clarify the innovation class issues vis-a-vis software independence but also,

as Mark has pointed out, its applicability to other dimensions of the standard. That there needs to be a concurrent development of the policies for the implementation of the standard with the standard so that vendors and other stakeholders can understand the full implication of the certification standard. The standard must accommodate gradual change. We have experience now under the 2002, and now we're starting under the 2005, that argues that there is an abundance of gradual change that occurs underneath these systems over even a very short period of time. That the financial impact of the changes and the operational impact of the changes in the new VVSG need to be well understood. That the VSTLs should focus on efficient methods of implementing the testing methodologies for the new standard in part to shorten the duration of time, in part to shorten the costs, of the systems. That the open-ended vulnerability testing perhaps can be incorporated into the overall plan in a way maybe not as currently implemented or proposed in the VVSG. That there should be an increase in the clarity of the independent verification requirements. That multiple standards within a system that may be certified hardware to one standard software to another may have viability. Reduce the requirement for redundant and unnecessary documentation in the standard. Improve the efficiency of the de minimis change process. Make it easier to pursue certification. And I think one of the things that those of us who get so close to this process that we have to take our glasses off to see it we lose track that the real goal here is to not so much build a new standard but it's to build better systems, and the standard is our vehicle. It's our method for getting us to

that point. And our eye should always be on better systems and this standard is our method, is our tool for getting to that end. We should not forego the benefits of some component of the standards being implemented while we're arguing and debating the others. That there -- I've heard really throughout this discussion there are many, many positive improvements in the 2007 VVSG and those needed to be implemented yesterday and they would improve systems immediately. And the consideration of a phased-in approach to the standard as a way of getting to the improvements of the more workable parts of the standard. Simplify the technical data package construction and submission process to reduce redundancy. Consider field testing of units as a part of the certification process, and I think there's some states that do that and there's certainly some merit in looking at that. And then look towards the benefits like innovation of the standard and make sure that the implementation of the standard drives us towards that innovation and the improvement in the accuracy, security, accessibility and affordability of systems.

So again I want to thank the EAC, the Commissioners, for hosting this roundtable and the roundtable that will follow after. I thank the vendors for taking time out of your busy schedule and for sharing with your colleagues and sharing with us who work the vendor community the valuable insights into how this important document is going to affect your business in the future. And thank Brian and Matt for their work here today.

And with that we are six minutes early on adjournment, and I declare this roundtable adjourned.

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[Whereupon, the roundtable discussion adjourned at 1:51 p.m.]