United States Election Assistance Commission

Public Meeting

EAC Usability/Accessibility Roundtable Discussion

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VERBATIM TRANSCRIPT

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<u>PUBLIC MEETING</u>

<u>DISABILITY/USABILITY ROUNDTABLE DISCUSSION</u>

DR. KING:

All right, good morning, everyone. I'd like to call this roundtable discussion to order. I think all the panelists are seated and we'll begin here this morning.

This is the fourth in the series of roundtables that the EAC has hosted, gathering input from defined communities regarding the draft of the next generation of the Voluntary Voting System Guidelines. And today's discussion will be among stakeholders in the accessibility/usability community and their perspective on issues associated with accessibility/usability in the draft of the VVSG. What we hope to do today is to eliminate issues that will improve the VVSG and enable vendors and testing labs and jurisdictions to acquire voting systems that will be as secure, as accurate, as accessible, and as affordable as possible.

So there's a couple things that I'd like to do this morning, first, to ask people including myself, to put your cell phones and PDA's on mute. Many of you have noticed that if you have WiFi PDA and you don't put it on mute, it will come in through the microphones periodically, so I would appreciate everybody taking the appropriate actions on their electronic devices.

When we finish with our introductions, I'll talk about the format of the discussion today and how we're going to try to manage this towards an on time conclusion. And to date, each of

the preceding three roundtables we've ended on time, so that's my goal here today.

What I'd like to do is, to start at the far end of the table and each ask of the panelists to briefly introduce themselves and the organization that the represent.

MR. PEARCE:

Good morning. My name is Phillip Pearce. I am a TDGC Member, as well as, a Board of Advisors Member. I represent the United States Access Board on these two bodies and I'm pleased to be able to participate today.

DR. LASKOWSKI:

Hi, I'm Sharon Laskowski from the National Institute of Standards and Technology. And as you know, NIST has provided the technical support to the TGDC to develop these standards. And in particular, my team did the support for this Chapter 3 that we're discussing today. And my role here basically is to answer questions, provide clarifications, as needed, during the discussions.

MR. DICKSON:

Good morning. I'm Jim Dickson, Vice President of the American Association of People with Disabilities. We're the largest membership organization of people with disabilities in the nation. We have 100,000 members. I'm also here representing the Consortium for Citizens with Disabilities which is a -- which are based here in Washington and it's a coalition of a hundred disability organizations. As well, I sit on the Board of Advisors to the Election Assistance Commission.

DR. GOLDEN:

Hi. I'm Diane Golden. I'm the Director of Missouri Assistive Technology and today I'm representing the Association of Assistive Technology Act Programs. We are a network of federally funded Assistive Technology Act providers at each state and territory. There are 56 of us around the country and we focus on obviously providing adaptive equipment for people with all kinds of disabilities.

DR. VANDERHEIDEN:

My name is Greg Vanderheiden. I'm a Professor of Industrial Engineering and Biomedical Engineering at the University of Wisconsin and direct Trace R&D Center which is the federally funded center on access to information technology. It is a program that works on cross disability access. Thank you.

DR. SELKER:

I'm Ted Selker. I'm a computer scientist and Associate Professor at MIT and I'm the Co-Director of the Cal Tech MIT Voting Technology Project. This project was started by the MIT President, Chuck Vest and David Baltimore directly after the 2000 election. It's funded by about $100,000 per each of the two campuses by the Carnegie Foundation and Knight Foundation, pretty continuously and it's staffed by social scientists and technologists, thinking about forensics and technology and development of experiments, to test elections relative to technology.

DR. HERRNSON:

I'm Paul Herrnson. I'm the Director for the Center for American Politics and Citizenship and a Professor of Government and Politics at the University of Maryland. And I'm co-author of a book called

Voting Technology, the Not So Simple Act of Casting a Ballot that was just published by Brookings and I'm glad to be here. Thank you.

MS. QUESENBERY:

I'm Whitney Quesenbery. I'm a member of the Technical Guidelines Development Committee, non-representational. In professional life, I'm a usability consultant and I'm here in that capacity, but also as a former President of the Usability Professional Association and the Director of the Usability and Civil Life Project.

MR. RUNYAN:

I'm Noel Runyan with Personal Data Systems in California. We're independent, but our primary job is supplying access technology.

MS. SCOTT:

I'm Josie Scott and actually I'm also with the Usability Professionals' Association, a member of the Voting and Usability Project. In real life, I'm also a usability researcher. And I also have some real world experience in elections because I served many years as a state elections official and administered the election office for the State of Michigan.

MR. HANCOCK:

My name is Brian Hancock. I'm the Director of Testing and Certification for the U. S. Election Assistance Commission. Part of the job in my division is to collect comments on the Draft VVSG document, to try to synthesize those and finally put a workable draft together for our commissioners to vote on. Thank you.

DR. KING:

Thank you, Brian. And I'd like to recognize, we have some guests this morning. We have Commissioner Donnetta Davidson from the EAC. Welcome, Commissioner. And behind her is Executive Director, Tom Wilkey. Good morning, Tom. Well, thank you. And oh, I note that Chair Rosemary Rodriguez has just joined us. Good morning.

This morning, I'd like to briefly talk about the format of the table and some of the mechanics of how we will manage what we do. You'll notice that there's two microphones on the table. The microphone with the top mute switch is for the room and the second microphone is for transcription and it is always on, so no need to turn that one on and off, but you may choose to use the mute switch on the other as you see fit.

If you wish to be recognized, one of the things that will be helpful for me is if you could turn your tent card up on its end and that will help me identify who next would like to speak in the process. And I notice Gregg has wasted no time. It's a preemptive strike perhaps.

And I want to talk about what we hope to accomplish here today. When the EAC began looking at the draft of the VVSG, they recognized it was a much larger more complex document than in the past and the need to get focused attention on some of the common issues that were raised in the new draft of the VVSG from a diverse group of shareholder communities led to the development of these roundtables. And each member of the roundtable was sent a series, a collection of eight questions that we really need to address here today, although all of us recognize that the

accessibility and usability issues fall far outside of these questions. But these eight questions are the ones that the EAC has identified as the things they need assistance in resolution.

So as we move through today's discussion, my goal will be to get ten panelists through eight questions in four hours. So if you'll help me and as I often remind my students, if you'll kind of self regulate. If you'll divide that four hours by eight questions by ten people, will give a pretty good idea of how much time we need to allocate to each speaker.

As we put each question up, we'll try to motivate the question and talk a little bit about its background and why it's there and then we'll take a break at about 10:30 and we'll work until lunch. And when we come back from lunch, each member of the panel will be given an opportunity to make a summarizing statement. And what we're hoping for there is, as you've reflected on the comments of the other panelists over the morning, it will give you a chance to put together the handful of salient things that you think really need to be expressed to the panel and to the EAC regarding this draft version of the VVSG. So, not only will all panelists be given an opportunity during the session this morning to talk about their concerns or their issues with the VVSG, you'll be given an opportunity to make a closing statement, a summarizing statement at the end of today.

So with that, what I'd like to do is to use Brian's or this is -- here we go. This is Matt's laptop. And I'd like to move to the first question and talk briefly about the genesis of the question. Let me read the question. Are there emerging broad themes in the

accessibility and usability community that should be discussed as
an overview for this discussion? For example, new research
methods, new technology, and new methodologies for conducting
research. The genesis of this question really recognizes that in the
prior voting standards either the VVSG or the NASED Voting
Standards, usability and accessibility was really under addressed.
And to that end, the EAC really thought that it would be appropriate
to begin this session by asking this panel, are there new and
emerging things that would be of interest and importance to the
EAC?

So with that, I'm going to turn this first question over to the
panel. And Gregg, since you have your tent up already, I'll
recognize you first, I guess.

DR. VANDERHEIDEN:

That's what you get for following directions. The -- I'll be unusual
and I'll talk about one thing that we've been working on that should
not be incorporated at this time and that is that there's a new
standard called Universal Remote Console. It's a new ISO
Standard which is 24-752 and this going to show great power in
allowing people to control things around them by allowing them to
substitute interfaces on things in the environment, at home and in
work, et cetera. But in terms of voting, the research on the security
and those kinds of aspects is not ready yet. And at some point in
the future this may be relevant, but if it comes up at this point, I
would say that there's too many security issues, et cetera, people
are not familiar with it, to be using it so I'll just put that one off.

A separate one though, is USB, the Universal System Bus which is on all of the laptops. And that is a dangerous one from the standpoint that, from there you can hack your way into computers. However, it is possible to create a USB that's in a security sandbox, that is completely separate from the rest of the system. And this would allow a large number of assistive technologies and other types of interfaces to safely operate it. It would be like, more on the order of, well we don't want -- we want people to directly operate it. And you'd say, well, can they use a head stick? And you would say, well yeah, there's no particular problem there. So, we'll talk a little bit more about this later, but that is something that should be looked at more and but, whenever you talk about USB, the security people come out of their chairs. And so we need to make sure that we're talking about only a special kind, which is in a security sandbox which can't -- there's a complete firewall between it and the -- and not a software firewall, a hardware firewall, between it and the computing system.

And then just finally, the fact that, with aging, we know that we are finding, all of us, that your abilities decrease and -- but you don't see them, they creep up on you. And so, I think what is very good about what's happened so far, is that, usability is not being seen as a special thing off to the side for "those people" but being brought into the overall device, so that the device, voting systems as a whole. And that's going to be critical because of -- and I think that some of the errors and stuff that we've seen in the past would have been avoided if there had been more of the usability/accessibility brought to bear in the main part. Thanks.

DR. KING:

Okay, thank you, Gregg. Noel?

MR. RUNYAN:

Well, my comment is somewhat along the lines that he was ending up with. But as our country grays, I think the distinction between people without disabilities and those that have disabilities is going to gray. And a lot of people who don't, or won't, or refuse to self identify, as having a disability may find themselves using that accessibility technology more and more. And along those lines, I think it's important that we not support complete separate systems of accessibility, but have systems that have accessibility built in and as part of the main model of something, so the acquiesce kinds of nomenclatures that we have here, I think, should be backed off and instead we should be considering the accessible voting system and eventually we'll all probably stop using the term accessibility as a -- for someone else.

DR. KING:

Okay, thank you. Diane, I think I have you next and then Ted.

DR. GOLDEN:

I hate to be the wet blanket in the room, but I'll throw this out because it's an ongoing frustration with the whole discussion of new technology and there are wonderful, wonderful new technologies emerging all the time in assistive technology that could be wonderfully helpful, whether it's using USB interfaces or any other kind. Unfortunately, we're talking primarily about electronic interfaces. That's just where accessibility is in terms of people with disabilities now, because if it's electronic, it's

manipulable. You can put it into all kinds of different forms. You can meet all kinds of different functional limitations; if it's electronic and it's manipulable.

Right now, we are in this place with the security issues of paper being the gold standard of security. And as long as we have official ballots that are paper ballots, we are going to struggle with delivering expanded and new interface technologies because those are going to be electronic. And I am not a security expert, first one to say that, but I would also appreciate the security people not claiming to be accessibility experts, which many of them have over the years, saying paper is not a problem, we can make it accessible and it has haunted us. And again, I'm not here to argue paper, no paper, not my issue. But accessibility tends to be electronic and we've got to figure out a way to resolve the security conflict we have with advancing accessibility.

It's just sort of an internal issue and we've got to resolve it and basically do what's right across the board, but that's the challenge with new technology. There are wonderful new technologies, but it's going to be difficult to deploy them, given all the other constraints we're operating under.

DR. KING:

Okay, thank you, Diane. I've got Ted and then Whitney. Ted?

DR. SELKER:

Yeah, I have things to say about that last issue, but I want to start with the question. We are all disabled as we enter the voting booth. Long-term memory is flawed, short-term memory is limited, and perception is non-uniform. That's how people are. We -- without

memory aids, we make mistakes. Memory aids can be most easily come in the form of sample ballots that voters can legally carry only into some holding places today.

We just finished an experiment where we showed that 16 percent or more of people made the mistake in a congressional race, thirteen in Sarasota when they didn't have a sample ballot in their hands. Memory aids can come in the form of redundant, non-distracting information, such as is available on the tabs on our low error voting interface, where you can see a review page literally the entire time you're voting. It reduces errors by half. Memory aids can come in the form of feedback. Feedback that happens when you make a selection, can make a huge improvement over feedback that you have to look at later, such as a review page that you look at after the fact. We've had experiments where we demonstrate that we can reduce half of the errors in that way.

These kinds of technologies, we might think, are pie in the sky, Hart Intercivic, E, S & S and Diebold are all in a position to deploy audio verification. When the races have headings like federal over them and some other races don't, we find multiple times the errors on selections because of the different visual format that is shown. When races are physically small and there are physically large race on a ballot, people miss the small race, especially if it's at the top or the bottom. We find that with multiple times the errors. We find ourselves making mistakes when ballot layout confuses our notion of how many selections are required or which marks are needed to create it. It is well known that error -- optical scan ballots are much more errorful then bubble ones. And

people get confused when the clear notion of intention is not as important as following directions. And so, we find people writing their chosen candidate in the margins and in write-in places, only to find that they've over voted, if they were to watch it being counted.

Our new research methods, we found that running mock elections, where you do it in a real polling place, with real poll workers and you give them real voting materials, causes noise. We find that more errors are found by doing that kind of experiment. We've done several then, in our laboratory experiments, where we studied one particular thing. We've also found that, if we take 20 minutes and do a cognitive assessment of our subjects, you know what? We've had a third to half of our subjects in our experiments being reading disabled. Funny, that they're more interested in being part of studies than other people, but when you have a reading disabled person that is getting more confused and disorganized as they're going through things, it is a different subject and there are a lot of things that we learned that are pertained to them. And I believe that all experiments should have cognitive assessments in them.

I -- there's more things I could say, but I'll just say a couple. We are -- we've worked hard to get reading disabled people and other people with disabilities in our experiments. In some cases, we had to set up telephone banks, put advertisements in newspapers, and go to all of the communities that they are a part of. More recently, Craig's List has been our savior. It has reduced the cost of running our experiments by a third. There are new technologies and ways of running experiments that have to be --

that we can all take advantage of. We aren't pooling our knowledge about how to run experiments. I remember coming to Herrnson's lab when he started his experiments and talking about my experiences. I hope it was helpful.

We've begin -- tested in the long range view. My lab, we've started testing audio voting improvements. There is an amazing number of things that are not ready for prime time, such as we can structure the communication. We've had some sex -- success at clarifying selections using devices such as intonation, voice, voicing, background sound, enough double entendre, no, 2D placement of sound in space, speed of sound delivery, even overlapping sound can improve the delivery of sound. There are these -- a lot of ways of improving it. Today's audio ballots are difficult to make selections on, as are other ballots. And I look forward to all the technology improvements that can be applied in this area. And I believe that we should challenge the human computer interaction scientific community and with concrete requests, so that they can help in these regards.

Finally, I want to mention that in -- even with paper ballot accessibility, I have handed out to many of you a magnifying glass, a magnifying glass that's a straight edge. It's a straight edge not for blind people. It's a straight edge because everyone gets disorganized. Can we find that with reading disabled people, if you go to any of therapies, it's all about going down the page one at a time. Everything that structures with the act of voting helps people keep organized. We all get disorganized. We all miss selections

and there are lots of mechanisms we can use, even if we are

saddled with having to work with only paper. Thank you very much.

DR. KING:

Okay, thank you, Ted. I have Whitney and then Paul, then Jim.

Whitney?

MS. QUESENBERY:

This is Whitney Quesenbery. I'll just keep this quite brief. I want to

pick up the theme that Noel Runyan introduced and as did Gregg

Vanderheiden of universal usability or universal design and the

notion that what I'm seeing in the general industry, at the leading

edge, is a move away from separate interfaces for different groups

of people, but towards interfaces where improved accessibility and

improved usability raises the, you know, rising tide raises all of our

boats, and you end up with a system or an interactive system that

works better for everyone.

And the other point I'd like to make is that, we're in a time of

very rapid technological change. And it's very tempting to look to

the latest research results and to see what's absolutely coming out

new. One of the things during the TGDC where Jim Elekes was

our news watcher for new technologies, but one of the things we

heard from both the test labs and the vendors and the

manufacturers is, is that ready for prime time? Can we make use

of that?

To counter that, I would say that even when we're not out on

the leading edge of research, there's a lot of technology that was

esoteric, experimental just a few years ago and not -- how many

people in this room used dragon dictate, voice input and voice

output was very leading edge, very few years ago and has moved very far and very fast. And there are a lot of other technologies that started out as either special use or assistive technologies that we all now see built into systems and don't even think of as anything but a nice feature. And those are places where we really ought to be looking to how can we get our voting systems to be using the best of what's commercially available in the most effective way? Thank you.

DR. KING:

Okay, thank you, Whitney. Let's see, Paul and then Jim.

DR. HERRNSON:

I guess I would just like to say having completed a five year study and we did not only benefit from Ted's knowledge, we used his simulator and he's done a great service to us all by making it available.

Having completed this, I would like to say a couple words about what we did. We did a review by human computer interaction experts, some in the room. We did a laboratory experiment and we did a field study and what we learned were that these were complimentary approaches. We'd like to think our study was good, but we know that more work needs to be done.

And I guess here, I would just call for a different kind of approach, rather than centralized knowledge, have a lot more decentralized comparative testing, using people at the local level. And what I think would be very important, would be to have a statement for local election officials or state election officials,

people who do the purchasing, people who design the ballots, on how they can test their equipment.

And I would make some recommendations about what would be good to have in that. And first you need to, I would say, to focus on the local population and get a diverse set of people. And sometimes that means going out to where they are rather than having them come to you. And then the standard things would be to test the systems and ballots in terms of things like trust, ease of use, overall satisfaction. The need for help is a very important criterion, because it is something that affects the amount of time it takes someone to vote, the number of election officials, the poll workers that need to be on site, and those sorts of things.

Voting intent, as intended, is a very important measure; under votes, over votes. They're really important, although sometimes the under vote is an intentional under vote, which muddies up that measure, but we found the most frequent vote is what we call the proximity vote; accidentally voting for the candidate immediately before or after the one you intend to vote for or some other candidate. Now that's a double whammy, because not only doesn't your candidate get the vote you want him or her to have, but very often your candidate's major opponent gets that vote. So that's a pretty bad thing.

Other things to look at, obvious time to vote, and then maybe some informal observations about voter frustration. We witnessed that in the lab, we witnessed that in the field. And the usability experts who helped us, pointed out to some things early in our study that probably would frustrate voters. So, even if a local

election official or state official has purchased their voting system, checking the ballots if very important. Ballot effects are pervasive. They influence voter satisfaction, voter trust, the need for help, the accuracy with which the vote is cast, as well as, a host of other things. So I would recommend that that's important. So just a small test locally could make a huge difference. It would empower, I think our local election officials and voters a lot more than a 600 page paper, which I read and felt was excellent in some places.

So, I think that's pretty much what I'd like to say. Just new research should probably be done locally and by the people who are going to actually buy and deploy the machines so they have a better understanding of them and are better able to help people. Thank you.

DR. KING:

Thank you, Paul. I'd like to come back and ask a question of Paul, but first, Jim?

MR. DICKSON:

I want to make two points. I first have a question. Is there anybody from the vendor community in the audience?

MS QUESENBERRY:

No.

MR. RUNYON:

By design?

MR. DICKSON:

Were they invited?

MR. HANCOCK:

Yes, this is an open meeting.

MR. DICKSON:

Yeah, that's a little troubling. I want to follow up on something that Paul said and something, which was something that we learned through the existing selection process. It is extremely important that when equipment is being evaluated for purchase and is being tested for certification that real ballots be used in--

DR. SELKER:

We have a vendor.

MS. QUESENBERY:

One just walked in.

DR. SELKER:

Thank you for coming. You're the one vendor representative in the room.

MR. DICKSON:

That was nicely timed, Ian. The -- there is a significant discrepancy in the length of time it takes to vote on different voting equipment. And this is a very important point, particularly important in states that have long, multi-page ballots. Those have to be the ballots that are used for testing, certification, and evaluating a purchase. The much ballyhooed AutoMark can take 40 minutes for somebody to vote on it. Now that's dysfunctional. As people with disabilities, we expect it will take longer for us, for some of us to vote. Many, it will not take a longer amount of time, but we shouldn't be looking at factors of eight times longer than it takes the general public to vote.

DR. KING:

Okay, thank you, Jim. I wanted to follow up on something that Paul said. You had mentioned that perhaps pushing down some of the

usability and accessibility testing to the jurisdiction level would be
advantageous. Are you aware of any protocols that exist for that?
In other words, as a part of the EAC's election management
guidelines or other venues, that that information could be
disseminated down to the jurisdiction level?

DR. HERRNSON:

Well the protocols we use to test our system are in the back of our
book and they're also at www.capc -- it's not on? I'll just bellow it
out. The protocols we use to test our system are available in the
back of our book and they are also available on our website
www.capc.umd.edu and for another source of protocols, Whitney
has one.

MS. QUESENBERY:

Yeah.

DR. KING:

Okay. Whitney and then Josephine.

MS. QUESENBERY:

Actually, Josie, why don't you go first?

MS. SCOTT:

It's up to you. You can probably talk about it as well.

MS. QUESENBERY:

Well we're both wanting to talk about the same thing, so I'll just dive
in. One of the things that we did at the Usability Professionals'
Association was realize the same problem. And we put together
something we call the Local Election Official Testing Kit, the LEO
Usability Kit which is available at
www.usabilityprofessionals.org/civiclife. It is not a very rigorous or

scientific test. We call it actually a ballot check, to distinguish it from the more measurement oriented usability testing that might be done at the research level and it is intended to be something that can be used by a local official to check their ballots beforehand. We have Dana Chisnell, who is a member of our group, went to Washington State, was invited there by Director of Elections, Nick Handy to teach a group of officials there. It was very warmly received and I think it's something that we should be adding to the process.

One of the comments from professionals in our domain, for after 2000, was that there is a difference between quality checks and usability checks. And I would say between usability and accessibility checks and we need to be careful that we're doing all of them, but it doesn't mean that it has to be expensive, difficult, onerous, or time consuming.

DR. KING:

Okay, thank you, Josephine and then Paul.

MS. SCOTT:

I'll just add to that and say that we developed the testing kit with the understanding of the constraints that local election officials really do have to manage. This election year is practically impossible for some of the election officials that are managing elections this year, because of the Presidential Primaries, the constant movement of them, the additional elections. There are two states and mine being one of them that are discussing the possibility of conducting yet another statewide election and folding that into the process, but how would you possibly take all of the local jurisdictions, county,

and in my state, city and township level, and check your ballots? This kit allows them to do that and to come away with a reasonable measure of confidence or an understanding of where they might potentially have a problem.

DR. KING:

Okay, thank you. Paul, then Ted, Then Diane. Paul?

DR. HERRNSON:

A quick comment. One of the things we learned in our testing, was that some of our hunches didn't play out, including the idea that the paper ballot would be the standard by which everything should be compared. And so, I would emphasize that comparative testing is very important. If someone has been using a system for a long time or a ballot for a long time, when they test it and compare it to something else, they might find out, that what they were using was not ideal. In fact, one of the systems we tested has a certain format, a party common ballot that it uses as its standard, we tested an office block ballot format on the system and got much better results and that vendor was quite surprised, but pleased to learn it. So comparisons, I think are very important. Thank you.

DR. KING:

Thank you. Ted then Diane.

DR. SELKER:

The idea that the local people are going to be able to test things is a great idea. It is daunting. And I've had election officials come to me and say, I've got 139 people that are going to be selections for one race, how do I lay it out so no one is prioritized? I just went over my idea. I had a great idea. I'm an inventor. Is make it in a

circle like The Wheel of Fortune. But that they cannot do and so it was spread over six pages, okay. Now how do you do testing in a situation like that? It's very difficult. But there are specific things that we can help them with.

These guidelines that you guys are putting out, that the EAC is putting out for each of the different things that an election official has to do are excellent. They're excellent because they give them simple ways of trying -- of doing these things. How do we -- what we have to do is help them understand, what is the canary in the whatever it is, the cave or whatever. Yeah, the mine and, you know, they can't test everything but it's dangerous to have individuals speak the audio ballot when no one's ever going to test the audio ballot for all of the conditions and all of the situations. It's also dangerous to have poor quality audio. But I think so often we don't even know whether the audio systems work because we don't know, you know, at least a simple way of testing. Is it by sample? We have Ron Revest (ph) writing a lot of work on how to do auditing.

But I think that these quick and dirty experiments, I find that we can find things very quickly. The election official and I shouldn't speak so long -- an election official in Sarasota got on television and said this is a problem. People seem to be missing this race before they -- the day before the election. They knew of this problem and sometimes education of that sort has been effective. We know in the Got the Dots Campaign in L.A., they literally got the Dalmatian involved with helping people make sure that their dauber made the dots on that stupid InkaVote. They reduced their

residuals by gigantic amount. Was it any good? No it's still bad,

but that doesn't mean that it wasn't a valuable effort and a valiant

effort. It probably reduced the residual by two to three times for

them to have that education program. So education is also part of

what your tools are as an election official, when you know you have

problems because you will find that there will be problems.

DR. KING:

Okay. Thank you, Ted. Jim first, and then Diane, and then Noel,

and Noel, I'm going to let you have the last word on this particular

question. Jim?

MR. DICKSON:

Yes. I want to shift the focus a little bit to usability from the point of

view of the poll worker. It is extremely important that there be one

switch that turns on the entire system. We have received many,

many, many, probably, the single largest problem that we have

encountered with accessible equipment, is poll workers not

knowing how to turn it on. There needs to be much more robust

training of poll workers. We get complaints that poll workers

discourage people from using the accessible equipment and

encourage them, pressure them, to vote with assistance.

There's -- on the matter of locally testing the equipment, I

think that's a good idea, but I want to point out a very large danger.

In terms of disability access, there must be a broad and diverse

number of people testing the equipment. Disability is, you know,

what is accessible for me, a blind person, is not necessarily what is

going to be accessible for someone who has reading limitations or

learning disabilities.

I would point out that several major corporations have departments that deal with making electronic products accessible; IBM, SP -- Microsoft, and if it would be useful AAPD would be willing to help convene a meeting between these large corporate corporations who have already worked through many of these problems.

DR. KING:

Okay, thank you, Jim. Diane and then Noel.

DR. GOLDEN:

I'm going to follow up a little bit on some of what Jim said. And having local jurisdictions look at usability, is it a good, important, critical factor, however, I have to follow up on a caution. When it comes to accessibility and the legal mandate for one accessible machine per polling place, I've worked with an awful lot of states in an awful lot of local jurisdictions and their idea was, I'll just get a -- actually the leadership of my advocacy, local advocacy, disability advocacy community to come in and identify "accessible" voting machine.

And I can tell you, I just went through this with the State of New York and they're rather late entry in to the accessible voting field and they assembled a group of people and they were wonderful people, but they do not represent the universe of people with disabilities and functional limitations. And there were all kinds of suggestions made at the debriefing with that group of people with disabilities and it took a lot of discussion to back off from some of the suggestions that made sense to that individual person with a disability because of their personal preferences and the way they

interact with technology and their prior experience with technology,

whether they were Braille literate or not, not having the big picture

of the vast majority of low vision blind people are not Braille literate

so we know Braille markings are not going to be a solution for the

vast majority. It's very, very difficult to judge accessibility without

massive numbers of people and at a local level you just tend to not

be able to pull that off.

And the second point is, even if you do, quite frankly that's

usability by a group of people with disabilities and may or may not

help you if you get into court trying to defend that your system is

accessible and meets a legal standard for accessibility. That's a

whole different issue and that's why there are typically technical

standards that you can go into court and defend yourself saying, I

have conformed with this set of standards, thus I meet the statutory

requirement, very different issues. And whether you like it or not,

that's just part and parcel of what we have with HAVA and the legal

mandate for an accessible voting system.

DR. KING:

Okay, thank you. Noel?

MR. RUNYAN:

Yes, I find myself in a position that some people might be surprised

by with almost completely agreeing with everything both Diane and

Jim have said here. The -- in the testing we did of the InkaVote,

there's an example of a machine that, if run through these protocols

I've heard and suggested, wouldn't have caught one of the biggest

problems, because it might not have affected anybody's accuracy

or their satisfaction and that was the machine had a severe

personal injury problem. The machine could just collapse and dive on the individual and slam its sharp top edge right on their hands or face.

So there are issues like that that really do require experts with and I say experts plural because we need not just one good expert with a broad background, not a single individual person with each handicap or disability, but we need several and to address some of these different issues that wouldn't come through a very summative test, where you're just trying to generate data based on accuracy.

Agreeing again with what Jim had said, in my own experience in Santa Clara County with an electronic voting machine, two-thirds of the time the poll workers have not been able to get the machines working by themselves out of six elections. And out of two of those six times, the machine never managed to get working. That's, you know, reliability issues, also poll worker training issues. And in this last election, there was another issue rarely brought out. Jim had mentioned people having problems, with poll workers saying the machine didn't work or not being aware if it was working. And I found that of thirteen people interviewed in our area about their experiences, twelve of them had problems; the machine is not working, poll workers saying it just didn't work, and didn't have paper loaded in them. Somebody said the roll of paper in the bottom of the AutoMark up in Sacramento wasn't -- was jammed. There is no paper roll.

And so there's -- and Jim's absolutely right, that often the problem is that the poll workers have had totally inadequate training

for dealing with machines that could be very intimidating in their complication. And having to bring up hidden menus that aren't obvious or showing requires, you know, good memory. And so I would like to see the testing here shift, that we're talking about to have a lot more and better spelled out than we have in this document, poll worker training, but also see the vendors designing to require much less of the poll workers. It's not to shift all of their baggage of various things that sloppy programmers left behind and other fixes and band-aids to be cleaned up by poll workers.

DR. KING:

Okay, thank you, Noel. Whitney wanted to make a quick clarification and then Ted you can make a short comment. Whitney?

MS. QUESENBERY:

I just want to make it clear that there's a difference between testing a system to see if it's acceptable system to use and testing the ballot which is in fact designed and made up at the local level. The VVSG, of course, does not cover ballot design and ballot makeup, except in so far as the systems enable or disable features that would support good accessibility/usability. And what we were -- we did at UPA was very much focused on ballot design which I think was the question Merle asked.

DR. KING:

Um-hum, thank you. Ted brief comment?

DR. SELKER:

These things the way we're describing them can sound daunting. If training is done by demonstrating that you can do what you're going

to have to do on Election Day and doing it in a setting such as you're going to do on Election Day, people then demonstrate they can do it. Most training is not of that sort, the same thing with testing. If we would test things the way they're going to be used, we test them in a thorough and an end to end way. And so often we think that we're taking a shortcut by doing -- by scanning that the right candidates are in place.

I don't think that we have to make this be full employment for experts, right? We all are talking about we have to bring in experts for every possible thing and we have to have five or six in a room at every time. I think that we have to have good procedures, good protocols, and good exemplars that people can follow. I'm very excited about online stuff. I think that, you know, Second Life might a great place for people to be on this stuff and so on, but I -- but the main thing is, I think that we have to establish what the techniques and procedures are that are going to get us there. Because we might, you know, we might say oh, gosh, it's so awful to set up a computer to use as a voting machine. And I'm going to tell you about the 5,000 little cubby holes in the L. A. Election Office where they have to put specifically printed different ballots and then find -- and they have to all find their way to the right place.

So there are problems with any of these systems. And until we figure out how to make those procedures simple enough that people can do them and give them the prosthetics that allow them to, we're going to have problems.

DR. KING:

Okay, thank you. And Noel, your card's up, again, you may be making a pre-emptive strike...

MR. RUNYAN:

Well you did say I would have the last word.

DR. KING:

You know, it's just like...

MR. RUNYAN:

So I just did.

DR. KING:

The only thing I know is that I won't be the last word. I do want to follow up though on this discussion. And this was a good example of how an unplanned topic comes into the panel discussion and illuminates a whole different dimension and that is the usability and accessibility testing at the jurisdiction level and the impact of aging there, on the behavior of the poll workers.

And I just finished a training program yesterday with a group of election officials on the use of electronic poll votes. And one of the practices they've observed, is that historically they placed their oldest, least mobile poll workers on the printed election list. And when you pull the printed election list away and give them this high technology device, you're starting to see degradation in performance. And so at the end of the day, I guess the reminder for us, this is a human endeavor. And, but I really appreciate the insights provided by the panel on looking at the other end of the tunnel, so to speak, on the issue of testing.

What I'd like to do now is to go onto the second question in which I'll read. What are the overarching usability concerns in

voting systems and what are the overarching accessibility concerns and where do these intersect?   The genesis of this question, is really a statement of awareness on the part of many us, that we lack a complete understanding of the usability and accessibility issues and often we use them, just like I'm using it now, in the same phrase and so they often get confused as being the same thing. So this question is intended to illuminate for the EAC and for the members of the audience, what are the differences on these two approaches and where do they intersect, if, in fact, they do intersect? And Greg, I'll call on you first.

DR. VANDERHEIDEN:

Yeah, I think the first issue is the belief that they're not the same thing. The way to look at this is you have a matrix, a square, and on the left you have people who either can't use it or can't use it accurately. And on the right, you have a person who is able to use it perfectly and with ease. And then -- so that's left and right. And then coming from top to bottom what you have, is, at the top you have the person who is of perfect visual acuity, perfect senses, bright, intelligent, got a good night's sleep last night, has no worries, not -- didn't have a fight before they walked in the door, and not distracted in any fashion at all. And then going down, is all the rest of the human race. And at the bottom you have somebody who just is, for whatever reason, they slipped on the ice on the way in. They are not operating at an optimal level. Let's put it that way. And what we'll find of course, is, in this square, in the upper right hand corner, as you get to the top where you have people that are -- have no, nothing that's distracting them in any fashion, they're

going to be operating more off to the right and the better the design, the more they're going to be off to the right. And as you go down through people who are having problems, you're going to end up being more to the left which is people who are going to either not be able to use it or use it accurately.

And to say, well where's the accessibility? Is the person who just got eye drops in their eyes or had an eye operation yesterday or something and they can't see very well today, is the person who on the way in they dropped their glasses or they forgot their glasses. They actually may be more, if you will, disabled than an individual who has low vision and who is used to operating with low vision all the time. When they come in, are they going to go to the "handicapped" voting place? People who are older, very often walk in and all their friends are manning the booths. And the last thing they want to do, is to self identify themselves as oh, you know, I can't use this. I have to go to the special one. We really need to be looking at how to make the voting places usable by all of us, when we are at our best and when we are not at our best, and to whatever set of abilities we may or may not have.

And so I think the biggest problem we have around this, is thinking that they're two different things and, in fact, the question is, can the individual with the abilities and all the biases and distractions and everything else, accurately and easily use the voting system, and if you want to call that usability, that's great. When people can't do it at all, we call it accessibility but all it is is the other end. And the danger is that people who don't necessarily

identify themselves as having a problem but, in fact, go in and cast a ballot which does not represent their desires. Thanks.

DR. KING:

Okay, thank you, Gregg. Josephine?

MS. SCOTT:

Thank you. And I couldn't agree more. And a point of intersection for that very point is plain language. Using plain language on the ballot and any balloting materials in the polling materials for the poll workers and their training materials, can significantly add both usability and accessibility into the environment. A simple ballot, a plainly worded ballot will also be a ballot that provides sort of an optimized opportunity, for say, cognitive issues, as well as, that stressed, you know, citizen who has just come from work and driven in two hours worth of traffic, is upset about the election landscape in the first place, and attempts to vote an accurate ballot.

Plain language is a method for optimizing that voter's, all voter's opportunity to cast a proper ballot. It optimizes the opportunity for the poll worker to provide the right answer when a problem arises. It allows an opportunity for folks to make decisions, to jog their memories, if you will, as they are heading into the polls, so that they know how they intend to vote when they enter the polling booth because the ballot materials were clear and well worded, the instructions in the polls, et cetera.

And we've done a lot of work in that area. I would especially give some credit to Design for Democracy and their work for the EAC, because they are providing an opportunity. They're providing balloting materials that are very clear, very easy to use, and they've

tested them, so they know that as well. And there are other

activities as well, in my position paper that I've spoken about so.

DR. KING:

Okay, thank you, Josephine.

MS. SCOTT:

You bet.

DR. KING:

Diane, then Noel, then Ted. Diane?

DR. GOLDEN:

I'm going to reemphasize and I agree completely, from a theoretical

and best practice perspective, usability and accessibility are

interrelated. Universal design is part of whether it's universal

design for the built environment, architectural universal design, and

then there's a subset of the ADAG [ph] and accessibility standards

or it's the universal design for learning which is a buzz word in

education that's talking about, you know, variable media and

curricula. And then there's a subset of kids with disabilities who

benefit from it, but all kids benefit from universal design for learning.

However, my caution is again, accessibility is a legal

requirement under HAVA. The one accessible machine per polling

place they -- I'll put on my hat as a special education and vocational

rehabilitation hearing officer, I spend way too much time in legal

proceedings and with attorneys. There is a difference between

universal design and a legal mandate for accessibility. And that's

where the VVSG plays a really critical role in providing the technical

access standards that someone is going to use to defend

themselves to say, yes indeed, I have purchased and deployed my one accessible machine per polling place.

And again, whether you like it or not, that's the reality of the situation and so there is a difference between "accessibility" and the bigger picture of usability from that perspective.

DR. KING:

Okay, thank you. Noel and then Ted.

MR. RUNYAN:

But I think, if any of the machines that you would have as your "usable" general public machines met all of the capabilities because they had an accessibility built in from the beginning and were included in it, then I don't think you'll have a legal problem. We in the usability community for years have the term curb cuts in referring to those as things that other people use and that they don't have to say if you're going to roll, say, a baby carriage up a curb cut, you don't have to say oh, that's only for people in wheelchairs, so I can't use it. So there are a lot of advantages of having those write in with the general system and if they were done properly, I think they can really be meeting the legal requirements for accessibility.

When we discuss later here the cognitive issues in one of your last questions, my feeling is, that almost all of the obvious things are being left out on cognitive impairment accommodations are usually things that are issues of good design that help everybody. And that if you simplify the design to help somebody who's cognitively impaired, I think that helps the rest of us who have cognitive impairments we don't really admit to.

And that, the other thing is, that if you're talking about electronic computerized systems, usually the accommodations there now, such as large print, or audio output, some switch inputs, those are not hugely expensive add-on technologies for current technologies and they have not been expensive for a decade or more.

So I think we really should be looking a lot more at requiring single systems that are the accessible system and can be used by everybody.

DR. KING:

Thank you, Noel. Ted?

DR. SELKER:

Yeah. As we talk about our concerns about the aging poll workers, I find that -- myself getting a little uncomfortable. It's not about what your background is or how old you are or what you -- any other attribute, it's about whether you can do the task.

And as we talk about curb cuts, we have to be very aware that while a nice -- a wheelchair person would be very happy with a curb cut, a blind person would love there to be a little quarter inch lip at the bottom of that curb cut, so they don't find themselves in the street without it. And so universal design takes -- we have to take into account more than just our own particular viewpoints.

I'm just going to read a little short piece I have about this. The usability concerns of voting are many. Syntax and semantics are separated in voting. The rareness of the activity for both the people administrating and those participating in it and the difficulties of adding -- are added to this task by the importance of the act.

Record keeping, transportation, preparation through the counting feedback, redundancy, multi-perceptual acts of the entire process, all require us to be paying attention to the usability issues of those steps.

The overall overarching accessibility concerns surrounding coupling cognitive description and understanding of selections with actions that will make those decisions for voters, is, it has to be understood. The concerns are, of creating systems that adequate, give adequate information, structure, and feedback to the voter who can make decisions known that they know are going to be -- and know that they're going to be reported.

Specifically, my concerns also revolved around the usability issues of election workers who have difficult physical and mechanical actions to perform over and over again with accuracy. People have had a very bad time of doing things accurately and must -- we must design pre-audit activities, the procedures of setting up the election, the running of the election, the counting of the election, and the tearing down of the election in ways that people can do them. Hand counting ballots is nostalgic and seems like something that can be done accurately. It has many more errors than even the worst commercial accounting systems available. Printing, transportation, storing physical ballots might seem secure. It has not been. Ballots have appeared and disappeared regularly in recounts. The process of each handling of election material must be simple and supervised.

In my writing, the concerns that more than 6-1/2 percent of registered voters have short-term memory loss, I focused on the

access not assessment. Clear, simple systems with feedback,

memory aids, redundancy, can help people vote independently until

they cannot interpret and understand the meaning of the selections

they are making. At the point people can't interpret the meaning

and selections that they are making, they are not voting. I dream

that everyone voting can interpret the meaning of the selections

and make the decisions that they represent known to the

government.

DR. KING:

Okay, thank you, Ted.   And Phillip?

MR. PEARCE:

Thank you. I just want to make a couple of comments about the

concept of incorporating accessibility into all of the voting

machines. I think that that is a very positive step. One of the

comments that Jim Dickson made earlier was, when they turn on

the switch for one device, it would turn on the switch for all devices.

Well how much easier is that if all the devices are the same and all

the devices incorporate accessibility requirements into all the

devices? How much easier is it to teach poll workers how to

operate the machines that will accommodate persons with

disabilities, if all of the systems have the same requirements

incorporated within those?

And so, I think that the concept that we move toward a

universally designed system that incorporates the requirements of

accessibility, in all the machines, will eliminate a lot of the

problems, the lack of understanding, the lack of knowledge, the

confusion that we have from the poll workers and from the public

about how to utilize those machines. Now, is that a real world

possibility at this time? I don't know, you know, it may not be. It

may be pie in the sky, but I can certainly see that that would be a

very positive move to make accessibility fully incorporated within all

the machines that an individual would encounter at the polling

places. Thank you.

DR. KING:

Okay, thank you, Phillip. I'd like to move on now to the third

question and if we can address this before lunch, that would be

kind of -- I'm sorry, before our first break, that would be great. If I

could, let me go ahead and read the question. I think there's a typo

in the question. It currently reads, do the accessibility requirements

in the Draft TGDC VVSG, example, Software Independence

document, allow individuals with disabilities the opportunity to

participate independently. If not, what requirements should be

added/removed, modified, et cetera, to the standard? And I think

that rather than interpreting software independence as an

accessibility requirement, I think more accurately it's a security

requirement.

So I would like to open that question to the panel and Noel,

you've got your sign up. Phillip is your sign up for this one or -- no?

So Noel, then Gregg, then Jim.

MR. RUNYAN:

To facilitate this discussion, I would like to point out that there are

several uses and misuses of independence and independent, in

this industry right now. There is the sense which you often hear

people voting privately and independently or other terms like just

throwing independent around as if it's the answer. The part of the problem is, there, in what we're trying to address, I think there is a personal independence or truly autonomy. And there are many places in the voting process where personal independence is a real bulwark for obtaining privacy of your vote. There -- and that means that in certain places, I think, to guarantee your privacy you have to have very good and very complete personal independence.

However, we do not have complete independence throughout the whole voting process today for certain people and may never. Some people will never be able to sign the registry for themselves for example. But does that disenfranchise a person if they have someone else do it? I don't think so. Does it -- is it going to expose the security of their vote? No. There are different places and I think we need to keep track of those places, where really true personal independence is important.

There is another sense of independence and that is another personal independence in terms of being forced to divulge in front of a lot of other people. As you mentioned before, one of the panelists, may not want all your buddies and friends to realize that, maybe you have dyslexia and you're keeping that hidden and you shouldn't have to get up there in front of people and say that. Or somebody with an alternative language shouldn't have to say, well I've really got to vote in this other language. And so those should be things that can be private and person -- for personal reasons and should be kept secret for personal reasons and separate from the secrecy of the ballot.

There are two other senses of independence here and those were, I was considering senses that really should be called autonomy. These other senses are, one is independence between the verification process and the ballot marking process. And that is, as Jim said, more of a security issue of, can we have a system in which, when you verify the system you're using to verify doesn't know anything about and is isolated from, that's what we call modular isolation, in security terms, from the system or process that you used to originally mark the ballot.

And then finally, we have the software independence, as you mentioned. Software independence is a concept presented for, and I'll beg off on the lecturing here, but just to try to give a simple way of verifying, that uses people's eyesight or very low tech approaches that are independent of the use of software or other high tech and somewhat non-transparent forms of access to the information.

So, I would like to ask that we try to really keep these particular concepts of independence very separate.

DR. KING:

Okay. Thank you, Noel. Gregg and then Jim.

MR. RUNYAN:

Yeah, the first thing is, I think the question probably should say, do the usability and accessibility requirements allow access by people with disabilities, because some of the things that are needed by people with disabilities are actually covered in the usability section, as well as, in the accessibility which focuses on things. And I think the difference between the two here was, that there are certain

things that should be in all of the items -- all of the systems, and with the thought in mind, to the one off to the side, that what you say is, that there are some -- and so I don't think they're accessibility provisions, I would say that additional accessibility provisions, probably is the proper way to say it, since, if you throw all the usability out, there's nothing you're going to -- you can't patch it with accessibility because it's all part of the thing.

And then in answer to the question about things that should be added, and I think they should be added on the usability end. One of them is, audible confirm. And that is, if people had the ability when they did cast their ballot, they would hear what it was they cast their ballot for, then even individuals who think that they read it fine and voted for something because the first name was the same and they vote and then they find out, oh, wait a second, I didn't know there was a second candidate that had a name that started -- that looked like that. The -- a lot of the times where we have suspected that people, for whatever reason, marked, punched, selected the wrong item from what they really intended, if they heard the name read back they would instantly know that they had made a mistake. So an audible confirm.

And then the other one is, touch and read. And that is, you read pretty well but you can't see them very well. If you could just touch, especially on the touch key ones, you could just touch the names of the ones. You could even have somebody, who is very low vision and they can hardly see, except they can see where the selections are. They can touch down them until they found the one they wanted to and then they could mark it and hear an audible

confirm. And so you would have individuals who would be able to be voting in a form that appears and is just "like everyone else" but they would have this audible assist to help them if they have a reading problem, if they have a vision problem, any of these other types of things.

So those are two things that I think that we ought to be talking about. Thank you.

DR. KING:

Okay, thank you, Gregg. Jim, Diane, and then Ted.

MR. DICKSON:

As somebody who was deeply involved in the drafting and passage of the Help America Vote Act, I think it's real clear that the law says and that it was Congress' intent that, casting, reviewing, confirming a vote must be done privately and independently. I'm very troubled by this concept of S. I. In the previous set of voluntary voting systems, there was an attempt to force paper in, as the only acceptable security method. The Election Assistance Commission rightfully saw that as a violation of the law and stated clearly that paper must be accessible if paper is the ballot.

This Version II of the VVSG and the notion of software independence are simply an attempt to rewrite Congress' mandate and it's not -- and it's done in a very confusing way and I think that that confusion was deliberate, hoping it could have slip and slide by. Well it hasn't. And this document needs to say clearly, that if paper is the ballot of record, that the disabled voter must be able to independently read it, cast it, review it, and verify it. And any

attempt through confusion and complicated verbiage to undercut

that will not stand in a Court of Law.

DR. KING:

Okay. Thank you, Jim. Diane and then Ted.

DR. GOLDEN:

I'm going to follow up a little bit on what's missing because the

question is about what's missing in the current VVSG. And first let

me say, there's lots and lots of really good stuff in the draft version.

It, you know, improves dramatically on the previous version which

improved dramatically on the old FEC Access Standards.

However, the issue is, at least in terms of, for those of us who work

both on the disability access side and the legal side, when I talk

with the attorneys at NDRN and et cetera, I will quote HAVA's

statutory language, which says "voters must be able to verify in a

private and independent manner the vote selected by the voter on

the ballot before the ballot is cast and counted". I don't think legally

there's any question that if a paper ballot is the official ballot of

record, that the voter, voter with the disability or not, has to be able

to verify that ballot. Not the electronic ballot. Not the print -- the

software out of the print driver that printed it over there, none of

those things, not, you know, I could go on and on about the

shortfalls we've got right now in the current machines that are out

there. I don't think legally there is a question.

And currently the Draft VVSG attempts to address that in a

couple of ways, but the standards, the standard for the read back of

a paper ballot, in my opinion, is not sufficient because it allows an

auditory read back only. And for a person with a disability who

generated their ballot in large print, never put on a headphone, never used the auditory interface, to all of a sudden at the end of the voting process be asked to interact with the machine completely differently and learn a whole new set of input commands and output, from a usability perspective, I think it's going to sink the accessibility quite frankly and the voter won't be able to verify.

I know that complicates things but I think that's just a glaring oversight. And in terms of the number of people with disabilities who need output adaptations for vision problems, large print is much, much, much more common than the auditory output need is, in terms of number of people with disabilities. When you add into that the vast majority of those people with low vision are going to be elderly, who also have pretty poor hearing, asking them to use an audio ballot at the end of the process to verify a print ballot is not feasible either. So I think that's one really large hole in the standards as they're currently written.

And the second really large hole is the paper handling, in order to, even setting aside the controversy about whether or not people need to be -- have the ability to independently cast a paper ballot, do they -- I don't think there's a question about the fact that they have to be able to independently verify that print ballot. And again, if it's a paper ballot system and you have to physically handle the paper in order to verify it, people who cannot perform that task are not going to be able to verify their ballots.

And the current VVSG standards about that, I would interpret, to require some sort of automatic paper handling but I can tell you that they're written in a way that an awful lot of people do

not interpret it to mean that. So I don't think the current standards are clear. If that was the intent, they need to be revised to expressly communicate that.

Other than those two huge elephants in the room, overall the current standards, I think, have gone a long way to improving the existing guidelines.

DR. KING:

Okay, thank you. Ted then Whitney.

DR. SELKER:

Yeah, I enjoyed Gregg's comments. These are the simple things that he described are being said from an expert's point of view. When you allow a person to use some small amount of their perceptual experience, you know, ability to be an entry into some other way of solving a problem, you are giving them a more reliable approach to getting through their ballot.

The question of independence that we brought up, I think, is worthy of talking. I have watched as, you know, a 45-ish person stood with her mother saying, this is how we feel about this and the mom said no, this isn't what I want to vote. Wel,l this is the way we feel about it. We discussed this before and made the selection, okay. So I mean I'm on the other side of the booth. I'm sure they were just saying that for me but, no, independence is a reasonable thing for us to be concerned about.

The perceptual versus cognitive feedback issue is a big deal, too. When you start playing, as we were hearing with the audio, after you've gone through a whole ballot visually, it won't be reminiscent. But when you -- when somebody pushes Gore and it

says Schwarzenegger, they are very different words and the audio is a perceptual different modality. That different modality means that there's not -- that there's no clashing in your mind. There's a way in which when you have the same modality saying two different things one after another, that one of them kind of blanks out the one before it. So these -- multi-modal thing is a good thing.

And one thing that we have to think about if we really do want people to verify, not something to be verifiable, but to be verified, we probably have to know what -- when will we trust that? And so if we have a person who pushed a selection and the one next to that got selected, we call that flipping, a lot of times, it turns out that that happens one in 200 or one in 30 times. The minimum that I've ever been able to measure is point -- a half a percent. Then they say they did that and the paper trial says they didn't, maybe we need a video that shows them which happened. And so we have to be careful about what the goals of these different "usable" systems that are parts of the process are.

I just want to read one paragraph this time. Because the word software independence came up, I have had a concern about software independence keeping any electronic and technology from being part of any selection or audit process in a trustworthy way. Remember that all technologies are -- have their problems. And single agent independence is a term that's very similar only less restrictive and that it requires any undetectable error or fault in any specific part of the voting system to not be capable of causing an undetectable change in the election results. I'll go over that a little later again but the point is, that with a small change in wording, we

can start looking at these issues being about supervision. That's what we want. We don't -- we want things to all be tested. We want them all to be checked by other checks and counter checks.

I have spoken a lot about software independence. When one person assists another they should be monitored. When poll workers need to be monitored to assure that there are accessible options offered to all people. The mechanical and electronic solutions we have contrived in voting are attempts to take one person's hand off another person's votes. The goal's a procedural goal. We must consider the entire process to achieve the independence that we want in private voting. For any voting technology to work, the VVSG will need to define how the testing set up, usage, breakdown of the equipment is done in a way that is independent of any single agent.

DR. KING:

Okay, thank you. Whitney, then Noel, then Paul.

MS. QUESENBERY:

I just want to make a quick point and then Paul and Dr. Laskowski to talk about some of the work that NIST is doing now. One of the principles that we started with, I think in our very second meeting Resolution '05 or something like that, was thinking about the difference between design standards and the ultimate goal of those standards. In order to make a testable set of standards, we have a lot of very specific design requirements which we hope and believe will add up to usable and accessible systems. But in the end, the goal is a usable and accessible system, not to meet the requirements. And so one of the concepts that we introduced is

something we called, end to end accessibility. And I'd like to just

get Dr. Laskowski talk a bit about the work they're doing.

DR. KING:

Sharon, go ahead.

DR. LASKOWSKI:

Okay, thank you. As many of you know, we're currently working on

the test methods in support of the current version of the VVSG.

And in support at the end to end, in support of the end to end

accessibility testing, we are working on a test protocol that would

bring in -- well, you know, in a simulated situation, voters with a

spectrum of disabilities to actually go through end to end to see if

they can use the accessible system, as documented from the

beginning of going up to the polling station, the voting station, to the

end of -- ending with ballot submission. So -- and that would be a

pass/fail test using a selection of people with different disabilities.

So we're working on the details of that test protocol.

And while I have the floor, I'll also make a plea. We try to

make the language as clear as possible, but there's a lot there and

there still seems to be some confusion about the dexterity

requirements. And so, I make a plea to please give us suggestions

on how to make it clearer. And in particular, for the dexterity and

support for non-manual input in Section 334, there are two

requirements that state that the accessible voting station shall

provide a mechanism to enable non-manual input that is

functionally equivalent to tactile input. And a second requirement

on ballot submission and vote verification, if the voting station

supports ballot submission or vote verification for non-disabled

voters, than it shall also, shall also provide features that enable voters who lack fine motor skills or the use of their hands to perform these actions.

So as I said, we welcome any suggestions as to how we might clear up any confusion in this respect.

DR. KING:

Okay, thank you. Noel and then Paul.

MR. RUNYAN:

Well to sort of help focus on some of the issues Jim brought up about the independence and where it may be appropriate the -- and how it applies to this spec, I would like to suggest if we look at the model of a split machine that's been suggested and in this case we're talking about a ballot marking device, if you have a ballot marking device that has all of the wonderful user interfaces you want, of touch screens, and switch inputs, and audio output, and simultaneous audio, all of those and that is a user interface. This is the system you could use -- go through, mark your ballot with it, and then use the same user interface to verify it. Now this is not -- the verification for this is not software independent, but the machine could be designed in either of two ways. And something like the AutoMark today, that is all in one machine. And one large set of software does both functions and might have a problem, innocent or otherwise, that which would cross from the one process of marking to the other process of verifying.

If you split that down the middle into two separate machines and made the person move from one machine to the other and move the paper, that becomes a human factor's nightmare. And

even if you have a nice paper path, like the Autocast that AutoMark folks have come up with, that automatically move the ballot without having to be handled. You still have to put down earphones, maybe wait in a line or whatever, pickup and reconfigure the interface on the other machine to be identical to what you just used, right colors, magnification, speech, whatever. That's a nightmare.

So the split machine is a machine that could have both processes, selection, and the verification. But it has a user interface that is mechanically switched between the two sides, so that the software from one side would not mingle with the software from the other side or communicate. And the user just sees the same interface. And this is a security solution inside. And now throwing out this model, I would like to ask how this spec deals with that? If the spec requires complete software dependence on the verification side, then you've just shot down this kind of a technical solution. So I don't think that we should have in this soft -- in this spec something that would rule out a solution, a possible solution like this.

And I think that the other thing is, that what's also been suggested here and people have read a little bit different from what Jim was assuming on this, is, that this spec says that the system would have to be able to read, as in optical character recognition of the ballot. Implied in that is, it would be able to parse up and format the ballot, figure out, which is which race and which is which candidate, and then present it in one or more languages which may require language translation and at least language recognition.

Now those -- if we have legal experts identify this -- that as the real outcome that would be pointed to in legal arguments later, we would have, the way the spec is worded right now, have ruled out a possible technology like that. So I would like to see the wording change to, I think you could still make Jim's interests satisfied, other than it's inherently paper, but it would give good verification but would be not asking for quantum leaps in technology to get past.

You know, I certainly agree that the AutoMark today has its problems. As some of you may not know, it cannot read the write-in, when you have printed write-in and you go back to verify, it cannot read it. And even though it printed it itself and that's I think a weakness of that technology. And we certainly would not want, I think, to be ruling out interim technologies of that sort, that would say, add conformational OCR recognition to the write-in on a ballot to verify it and to add other technologies to scan in the whole ballot.

But I'm very concerned that I think this spec goes too far in trying to define some of the technologies here, over what are tricky issues, but it goes way too far and can squash certain technologies.

DR. KING:

Okay, thank you, Noel. I'd like to just make a quick follow up comment on Noel's observation. In the proceeding roundtable discussions, particularly with the testing labs and the vendors, the issue of ambiguous standards for which the creation of tests would be challenging, as well as, contradicting standards came up, so I think your comments are well within the same context of other comments we've heard regarding standards. Paul and then Jim.

DR. HERRNSON:

I wanted to pick up on the comments about the audio verification. There are several verification election audit systems that have been -- solutions that have been proposed. Paper is one, audio is another. There's a cryptographic solution which is based on a separate computer system and also a separate computer monitor system. And it's very important to think about what the objectives are when you add these systems to a voting system. When we tested these, we tested a plain DRE Voting System compared to several DRE Systems that had these add-on verification units. And the findings were that they didn't substantially improve the voting process. They--we did test prototypes and the audio prototype was very early in development, but they didn't do that well.

And one of the -- and here's one of the issues that I think need to be thought about. Every time you add something to a basic voting system, you add complexity. You also increase the amount of time it takes for someone to vote. We found that you increase the number of people who need help. And you also need to be wary of some unanticipated results, such as trying to load a piece of paper into a paper trail system that can only be loaded one way.

We had run into a problem we never thought we would and it was the problem of the homeless voter. They're entitled to vote if they've got some kind of address or maybe I should be more generous and say the unclean voter. So this person came, got in line, put on the headphones, and that created a problem for the next person in line because that person did not want to go near those headphones. So there are all these little unanticipated things

that pop up, as well as, when things are added, they can often detract from the voting process.

DR. KING:

Good, thank you, Paul. Jim and then Gregg.

MR. DICKSON:

I want to follow up, and I really like Ted's concept of single agent independence, as a way to define what we're looking for here. From the point of view of vendors designing equipment, the current structure with some disability features in a disability section and some of the usability section is very, I think confusing. And so I think that the document needs an appendix, where -- or you need to list all of the accessibility requirements in one place. I realize that that will be redundant, but it's -- the designers have enough to do without having to spend a week and a half hunting through this document to find all the accessibility requirements.

The last point that I want to make is, again speaks to the narrowness of the S. I. Standard. Auburn University is developing a system called Prime 3, which uses video which is accessible. And Auburn has invited security experts to try to hack the system and so far, they've not been able to. Now maybe that will change, but as I read the S. I. Standard, this very innovative video solution would not work,

DR. KING:

Okay, thank you, Jim. And Gregg, I'm going to let you have the last comment before we take a break.

DR. VANDERHEIDEN:

It will be very short therefore.

DR. KING:

Thank you.

DR. VANDERHEIDEN:

I was just going to say that there's two things been discussed and we need to keep them -- they're both important but not confuse them. One of them is, after you've cast a ballot and reading back the ballot that kind of a thing, the other part that I'm talking about today, is not one of security, did somebody cheat? But the even bigger one, they're both important, but the even bigger one of, did the person actually figure out how to cast the ballot right in the first place? So that, even if everybody is honest, we end up with elections where people's intents were not recorded and that is the one I was talking about where they're actually voting along.

The other thing is that, all of these systems, if they're designed right, if you touch them and they're talking and you go onto the next touching, it cancels the last one out, so that it doesn't slow down the voting process for everybody. For example, if everybody had to press and then wait for the name to be read before they went to the next one, it would slow it down. Most people don't need to do that. It would only be people who wanted to the audio confirmation. And again, they push it and they only have to listen long enough to know that they, in fact, got the one they want and they can go on and vote for the next item. So there isn't the need for it to take a long time.

But that is the one thing we're talking about which I think is a rather large problem and we have things that we really believe, where we've seen people who -- large numbers of people who

voted for somebody other than they really intended to and that's a real tragedy even in a totally honest system.

The other one is that, can you can verify auditory afterwards, in terms of that what was recorded, is actually what you vote. And so I just want to make sure that we don't get those two things crossed over. Thank you.

DR. KING:

Okay, well thank you. What I'd like to suggest then, is that we take a brief break and reassemble here right at 11:00. And we're going to start on Question #4 that really deals with the administration of the standard, as much as the standard itself. So let's stand adjourned for ten minutes.

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[Recess from 10:51 a.m. until 11:08 a.m.]

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DR. KING:

Okay. Question #4 is particularly germane, since the last roundtable discussion of this group was with the testing labs. And let me read the question. The accessibility/usability testing is always a concern and particularly because, to the knowledge of the EAC, there are no certification programs which would allow lab personnel to become experts in the field. And this question, in a different format, was posed to the VSTL's, to the Voting System Test Labs and they also expressed concern about the availability of individual's with the expertise in usability and accessibility, to be brought in to support the testing of lab systems.

So the follow-on question here, to the panel is, do you have ideas or suggestions on where qualified testers can be found or created that can assist the VSTL's in testing against the new standard in whatever format it takes. And Whitney, I'll call on you first.

MS. QUESENBERY:

So I'll just -- this is Whitney Quesenbery. I'll just start by expressing a little bit of frustration that NVLAP decreed the usability and the accessibility requirements to be core requirements for the voting system, which sounds like something that would be great. The problem is that that also means that the people who test those requirements have to be on the staff of the test lab. Now that also sounds great because I would actually like to see our software and hardware test labs have much better knowledge of human factors and accessibility and usability and be able to do it, but the truth is they don't right now. That it's never been part of their core requirements.

I assume that they are competent in the fields that they are competent in but it's a little like taking me and saying you're a usability company, you now have to test, you know, Shake and Bake. Well I don't have any experience there and I don't exactly know where to get it and I certainly don't have it on staff. So we are changing the ground rules. And I think we need to be very clear that we're doing that. And if that means they have to find companies they can put on retainer or consultants they can put on retainer to be part of their test sweep, we might actually have a

follow-on effect of improving testing overall in the country but that's not really our job here.

So I think -- I find that a little frustrating. I find it frustrating as the former president of one of the three or four major associations representing people who do this for a living, that we hear people in the software community and hardware community say, well, we don't where you are, we don't know how to find you. We're out there. There are many large companies that do usability testing. I know a lot of us do more formative testing. We are looking for a more rigorous summative kind of testing in the conformance tests, but those companies are there. They are members of Usability Professionals' Association. They are members of Human Factors and Ergonomic Society. Some of them are members of SIGCHI, the ACM SIG on Human Computer Interaction. Those -- we are out there and we exist. We have degrees in things like cogno psychology in psychological and research and social research methods. Sometimes degrees in computer science and we are seeing emerging degrees in human computer interaction, in information design, all of which often include usability and now often accessibility in their curricula.

So it's not like we are -- we have created things that need to be tested for which there are no experts out there. The problem is not that the usability and accessibility communities don't intersect, but that often the software testing and the usability communities, not to mention the software design and usability communities don't tend to intersect.

DR. KING:

Okay. And I think that's an excellent observation, that the testing is the end point, but perhaps the intersection needs to be pushed further back up the development cycle. Ted?

DR. SELKER:

Well the concern that you have to have somebody that's a trained Ph.D. in usability to do a test isn't quite true either. In my experiments, I never am the person that administers the experiment. You want to separate the subjectivity of the hypothesis generation, the experimental design creation, the materials checking and setting up for experiments, and then running it itself and the data analysis is another aspect. But the point is that, this concern that people aren't -- that we aren't going to have, you know, Ph.D.'s in usability sitting there doesn't mean that they can't be administering well thought out, well worked out protocols with good materials that will allow us to have the kinds of results that are going to improve elections throughout the country.

DR. KING:

Okay, thank you, Ted. And back to Whitney.

MS. QUESENBERY:

Just one thing to add just to agree on follow-on with what Ted said. The usability tests and the accessibility tests that the VSTL's will be conducting, they are not going to be writing those test protocols. Those test protocols and if Dr. Laskowski wants to jump in and talk about it, but the point is, that those test protocols will be written, they have been researched, vetted, and are in the process of final development now. So we're not just saying go out and figure out

how to test it, we are actually -- the VVSG in the end will supply the test.

And I guess one other point to mention, which I think again goes along with the point that Ted just made is that these are not qualitative tests. The work that Traugott and Conrad did on Paul Herrnson's project is awesome and amazing and detailed and rigorous, but it requires people who actually know what they're doing to do that work. That's very different than a performance test, in which what we're looking for is does -- do participants in the test, do voters using this system meet the performance benchmarks. It's a quite different beast. And it's administered different, more importantly it's scored differently.

DR. KING:

Okay, thank you. Diane?

DR. GOLDEN:

A little bit of a follow up to those comments. My experience with the existing testing labs and system was clearly that there was a lack of understanding, expertise, related to the accessibility standards and I'm very hopeful that the testing protocols will help alleviate some of that because clearly there were just misunderstandings. I mean, I can tell you very clearly there were -- are pieces of equipment on the market that I saw the ITA reviews and they passed certain, this is old FEC Standards, passed certain FEC Standards and there was just clearly no way the machine conformed to that standard. The automatic volume default is a classic example. There are machines that were certified as conforming to that and I have no idea how you could interpret the

word automatic default to mean anything other than an automatic default but these required, you know, someone to manually reset, which is not an automatic default.

So I'm hopeful that the protocols will help, but I think part of the issue, part of the reason for the lack of understanding of the standards was because the folks in the labs did not have background experience with people with disabilities and accessibility types of standards to readily realize why an automatic default was very important or why, you know, the accessibility of the write in information was critical.

So hopefully the protocols will help. I am suspecting that the labs will still need some support and the field of assistive technology or rehab technology is a bit diverse and, you know, it's not as if you open the Yellow Pages and find an assistive technology or rehab technology specialist, but there are organizations. There -- I'm part of network of state AT ACT Programs that is available across this country. Gregg's part of the rehab engineering networks that the federal government supports. So there are some resources out there that hopefully the labs could make use of.

DR. KING:

Okay, thank you. Phillip?

MR. PEARCE:

Thank you. Yeah, and to kind of follow up on those comments and maybe take it in a little bit different direction, the one thing that is available out there currently, is that there are federal agencies who are involved in these kinds of trainings and testing and those sorts

of things that have started to develop a fair amount of expertise

with that. And then coupled with the people in the private industry

who also are expert in the area, I think that there's an opportunity

for some of the -- either the federal agencies or for some other

entity to coordinate some training of those tests labs to help them

understand the things where they don't continue to operate on a --

from a perspective of ignorance but actually one of being informed

about how to conduct the tests and to accurately be able to

determine usability and accessibility in the voting systems. And so

I would encourage us to look as much as anything to ways to

develop training sessions for those people.

DR. KING:

Okay, thank you, Phillip. And Ted, I'm going to let you have the last

comment on this question.

DR. SELKER:

Just quickly, I want to -- I just want to express sadness that while

there's a lot of small companies that the government wants to

support in the way that they do their funding allocations, there's a

lot of universities with very -- with a lot of experience and are even

willing, people willing to help and train, and even place good

professionals in places where they can make a difference. And I'm

sad and concerned that there isn't a process whereby the EAC and

other agencies are able to fund easily, university research or

university personnel in this area. I think it's a very important area.

DR. KING:

Okay, thank you. I'd like to move on now to Question #5. Let me

read the question first. Would component testing and certification

assist in bringing new and better assistive technology to voting systems? And then as a follow on, what technologies have you seen that would be useful to voting?

One aspect of the proposed VVSG is it would require system testing of all components of the system. And there are many good reasons to argue for system level testing to ensure integration, to ensure there's not side effects. On the other hand, it has a tendency to discourage development of innovations and most importantly quick deployment of needed remediation to systems. And so the overall question of component testing has come up in several of the other roundtables. And what we'd like to do is discuss that in the context of the usability and accessibility issues and the impact that component testing could have on innovation and remediation.

And I'll open the floor to comments. I have Noel and then Diane, thank you.

MR. RUNYAN:

I guess I would like to ask for a little more clarification of examples of what you would consider components.

DR. KING:

For example, if a new adaptive device were to emerge out of research, out of a university that would clearly be advantageous to voters, it would require if it were married to a voting system, for that entire voting system to then go back through the certification process. Given the projected timetable now for certification testing both within the manufacturer/vendor, as well as, within the VSTL, we could be looking at two or more years before an innovation

reaches the market or probably more importantly, if there is a

needed remediation, something that needs to be fixed. So

component testing permits the testing of an individual component

for correctness and deployment as opposed to requiring the entire

system of which that component is a part to be tested.

MR. RUNYAN:

And so, if for example, we're talking about a sip and puff switch for

switched input devices, that might be an example of what you're

talking about?

DR. KING:

That would be correct, yes.

MR. RUNYAN:

Okay. There -- I would wonder what you would consider testing, an

adequate testing of that. For example, Sequoia has the audio jacks

for the sip and puff were imbedded inside the case so that the right

angle sip and puff switch which they supplied wouldn't even fit in

the jacks. And although you could have tested that right angle jack

sip and puff switch and say well this is a fine device, it seems to

work fine and then have it in the field and have counties actually

buy it and then discover that there's a system problem.

So my question would be, one, is whether any device like

that you're testing regime would include testing with all current

equipment and testing with the soon to be certified equipment just

to make sure that would work as a compliment on those different

machines. Just some basic functional problems like that.

DR. KING:

Yeah, Noel, I think that really is at the heart of the issue whether that we require the regressive testing of the entire system once a component is changed or if there is a methodology by which a component can be modified and moved quickly into the field for deployment without a one and a half or two year delay which may give the result of the entire system testing. I have Diane, then Gregg, then Ted, then Whitney.

DR. GOLDEN:

Yeah, I'll beg Whitney and Gregg's forgiveness because this sounds like a tie tack discussion about ATIT interoperability. That's a long standing problem, but it really is kind of part and parcel of when component testing would be feasible and rational and realistic and when it would not. And the cleanest examples I have is the ubiquitous paper handling problem on the back end of a voting system which is primarily a hardware issue. Let's face it, it's -- you could -- it would be potentially possible for someone to build an automatic paper handling system that could be, you know, be attached to the back of a voting system, not have anything to do with the internal operation of vote generation, vote verification, et cetera. It is simply a, you know, a feeding paper from one point to another. That's a classic example of where I think component testing would make a whole lot of sense. And if somebody, if anybody would develop an automatic paper handling system and market it tomorrow, I think we'd all be ecstatic.

The flip side is oh, when you talk about components that are part and parcel of vote generation, vote verification and it's mixed up in the electronic interface, then you have software interface

problems and -- or potential problems in interoperability issues. In

component testing there can -- would be probably a pretty slippery

slope I'm afraid, just from a purely technical standpoint, because I

think there would be in -- you know and switch input is a great

example. The scanning mechanism for utilizing switch inputs

should be pretty standard. And in the AT world you have your

basic IT System and you load your scanning software and you use

multiple switches to control but there is that add-on software, base

software interoperability issue and I'm afraid from a security

standpoint, that might really complicate a component testing

approach.

DR. KING:

Okay, thank you, Diane. Gregg and then Ted?

DR. VANDERHEIDEN:

Yes. The -- in many ways, this does echo but there's one very,

very important difference. Almost all of the confusion in when we

talk about 508 and ATIT interoperability is with software interfacing

with software. And in the voting situation, we're not, at least in any

foreseeable future that I can see that we're going to be talking

about, at least I will, talking about having something where it's safe

to load foreign software onto a voting machine, okay? So we're not

going to be talking about software interfacing with -- AT software

interfacing with a voting machine.

When we're talking about ATIT or AT Voting Machine

interoperability, for security reasons, we're going to be limiting this

to give the person a different button. And this button is going to do

the same thing that another button did. You might have for

example some -- the ability to vote using just a few buttons on the machine but the person can't reach out and touch the buttons, they can't operate the buttons so you give them an alternate way of pressing the button in the same way as a head stick would be an alternate way of pressing a button and that would be allowed.

The -- if the AT can do anything other than just do a simple, you know, button press or have information sent to it that's going to represent itself, then we have all sorts of wide open security kinds of issues. And even that providing an alternate button has to be done carefully.

But there is where I think you can, in fact, do exactly what you're talking about. If there is for example, a standard connector including clearance, anybody who has an iphone or an ipod knows that you can get -- and they use a standard jack, only they close the clearance down so that most headphone jacks and stuff won't work, okay? And they do that for a number of reasons, but in voting, you don't want to have it that the point was made. A right angle jack which is, you know, one where the cord comes off to the side, if it turns out that you can't use that at all, but that's what the person has on their device, the person should have known, excuse me, before they showed up that was going to be a problem.

And that's really easy to test. All you do is you have a plug with that much clearance around it. It's just a little piece of plastic with a plug sticking out. And if you can stick it into the machine and it works, then you -- it -- you've got clearance. And anybody can do that without any training or testing of any kind. So if you have the

standard connector and clearance kind of things very easy to test for.

And the other thing though that you have to do is to have a little bit of standard operation. I do worry that if each vendor when they designed voting machines already, they try and make them look something like what people have experienced before. When they do assistive technology, however, it seems like they try to each invent a totally different way of doing it that people with disabilities have never seen before.

So I think that there should be some, you know, common ways of providing alternate access to what is a very straightforward task. And we have a number of thoughts on that, but I'm not going to share them here but if people are interested, we could talk about them. The standard connector though can't -- is something that can be done. It can be done in the way you're suggesting with component testing. And the important part about it is, the voting system vendors should never have to go out and test against all the AT that's out there because they cannot. And they just wouldn't even know what they were looking at. If you gave it to them and they plugged it in, they would say, how do I operate it? I don't have any idea. I don't know how to operate it.

So it would have to be that the vendors would make their stuff compatible with a plug that did something. And the AT vendors would then design their stuff so that it could work with anything that would work with the plug. And that kind of thing can be done from both a physical and an operation standpoint. Thank you.

DR. KING:

Thank you. And for the record, I would like to note that the vendor was taking notes during your comments. Ted and then Whitney.

DR. SELKER:

As a matter of policy, we have decisions to make. Do we want to be open, an open source that anybody can read the software and as many bugs as possible come out and they can be found by hopefully us before them? Or do they want them closed like we're using like one of the proposals I made in our 2001 paper was for using off the shelf game machines that don't have good API's, don't have any sockets or places you can put cards into and limit people's ability to program them.

But in general, the -- my goal of single agent independence is a statement that we do want all of these standardized interfaces so that we don't have the vendor making their own special sip and puff because that is another point of security. Once we have a system that is every part of it is coming from a specific place, there are ways of fiddling with that possibly. Even with the paper printer. When we have this verified paper printer, I would really believe that we should have a separate piece of software that is not integrated into and part of the rest of the voting machine. How do we trust that this paper isn't in collusion with the rest of the printing -- the voting machine?

And I think that as we work towards things that will make better ways for all of the different parts of the machine are not being able to affect each other, we will make more reliable machines and we will make component testing more feasible. And I think those

are worthy goals because for the big reason that we heard earlier

that the expense and difficulty of testing an end to end system that

is all integrated and monolithic is probably -- is prohibitive.

DR. KING:

Okay, thank you, Ted. Whitney, I'm going to let you have the last

word on this question.

MS. QUESENBERY:

Yes, yes, and yes. I totally agree, especially with the things that

Diane said. One of the things that we heard a lot in our security

discussions on the TDGC was that a simple system or a simple

piece of a system is easier to test than a complex system,

something that was very much what Ted was just saying.

So there's -- it's very attractive to be able to say I have a

switch or I have an input/output device that I'm going to test

separately but that is a component that can be used with several

systems. I think what we can't do is say I've tested this switch

device and that's the end of it. What we have to be able to say is I

can test this switch device.

There probably needs to be some appropriate security

requirements to make sure that nothing is coming across that

interface except what's intended which is Gregg's point about the

USB device. And then it gets certified for use with different

systems. We shouldn't have to go back to Shake and Bake on

every system to be able to test whether a piece of assistive

technology can be appropriately attached to it.

So you could have sip and puff from Vendor A that's been

certified with Voting Systems 1, 2, and 3, but maybe not 4. And if

you happen to be a jurisdiction that owns four, well you can't use it

with that so that we can create some way of allowing new interface

technology, new assistive technologies to emerge and enter the

election systems without jeopardizing the core security. And I don't

just mean security, reliability, security, fitness for purposes, all the

good things that the VVSG has intended to help ensure. We

certainly don't want to jeopardize that by introducing things around

the edge and so it's going to mean interfaces of some kind and

standard jacks is a clear and obvious one. Thanks.

DR. KING:

Okay, thank you. I will also share with this panel discussions

among the other groups did talk about the need for a common

method of modeling interfaces so they can be understood and

articulated and that's a key component for any kind of component

testing protocol.

Move on to Question #6. This is an issue that I think for

many of us who do not work in the usability and accessibility

community are very challenging to kind of wrap our arms around

and understand the full implication. I think we've heard a little bit of

discussion here today about and I don't remember who said it on

the panel but a rising tide does lift all ships and that if we make

systems better for some, they will be better for all.

And the question I'd like to read is are cognitive disabilities

addressable by the standard? Are they addressed in some way

either directly or indirectly in the standard and if so, what

improvements could be made in the standard in specifically to

address cognitive disabilities. And I'd like to call on Josephine and the Noel.

MS. SCOTT:

Well this is once again my opportunity to reiterate that sign language and the option of plain language standards in balloting materials will significantly improve performance for everyone and including cognitive disabilities. And as a consequence, I think that that would probably provide maybe the best opportunity and one of the stronger opportunities, let me put it that way, not the only one perhaps to address cognitive disabilities in the standard and I strongly encourage it regardless of whether it appears in a standard or not.

DR. KING:

Okay, thank you. Noel and then Gregg.

MR. RUNYAN:

Thank you. In my written testimony, I gave a couple of examples. There -- the cognitive impairment accommodation community has a lot of solutions to computer interfaces that can readily be used. It's not as, I mean, I've seen it mentioned in the previous version of the spec just sort of -- they seem to be stymied about how you would start to do anything but cognitive because it's "so complicated and multifaceted".

There -- an example I gave there are a couple of them, are things that are just right off the top of common experience in the field of things that do make systems easier. The example I gave of not having text go right up against the border of either a box or like a button or an embezzled screen. That was found in reading

machines for people with disabilities. It was a cognitive load that they had to sit there and their brain had to process, I wonder if there's something hiding under the edge or not showing before it could recognize a word. And in reading systems such as the Arkenstone Reading System and Kurzweil Reading System they learned to actually put a border in and move things away from the edges of the boxes like that so it made it easier for the mind. Turns out, that helps all the rest of us as I mentioned before that it does impact other people's reading speeds who don't seem to have any other cognitive impairments.

So these are the kinds of things that the field does have out there and I don't know whey they haven't been included in the spec other than these specs in some cases started off looking primarily at blindness related and low vision and expanding into other disabilities. But I think that there is no end of useful stuff out there right now. And the good news is I -- that someone mentioned before is that things don't usually cause great complication for other people using other interfaces. Most of these things are easy to do and they improve the system for everybody.

DR. KING:

Thank you, Noel. Gregg, then Jim.

DR. VANDERHEIDEN:

Yeah, a couple of quick ones. First, you had said there is, you know, if it's better for some it's better for all. Actually, I want to qualify that. It is very possible to make something better for something and worse for everybody else. The problem is that people believe that whenever you try to make something better for

some, you will make it worse for the rest. And if properly designed, you can make it better for one and better for all. And the key to that is if properly done. But we have no end of examples of people who tried to make it better for one and messed it up for everybody else. And so it has to be done carefully and this gets back into I think some comments made earlier about really having to go to the people who spent a lot of time working with a lot of people and making a lot of mistakes in the labs so that you can get it right when you go out the door.

In answer to your question are cognitively -- people with cognitive disabilities addressable in the standard? They already are addressed in many places. There is a lot more that can be done. And the ones I would just pick off the top that you could consider and there's a longer list but just plain language again I would like to emphasize that. And then the second one is plain language. And the third one is plain language. The -- there is other things, too though. The use of white space, proper use of white space can be tremendous advantage there. Putting a lot of lines around text visually makes things a lot complex and you may need them, but look at the white space to break that apart.

Highlighting, the ability to highlight a choice at a time. This also goes back to Ted's comment about the ruler. If when you highlight it would highlight the person, whatever goes with them, and the checkbox that goes with them, et cetera, it's a lot harder for them to make what they call tracking errors. Where they go over, they find what they want, they move over and by the time they

came over here, there's not on the right row, column, buttonhole, whatever it is that they're trying to get.

And then the two ones we talked about before, the ability to touch something and have it read to you and the ability to have something read to you. Again, these are option if you want to do it or not so that you know that what you chose was what you want. Those are just a few of the things that we can be looking at. Thanks.

DR. KING:

Okay, thank you, Gregg. I have Jim, Diane, and then Ted. I did want to remind the panelists and the audience, the EAC has a best practices effort underway also that deals with many of the issues about design that are very, very critical. Today's discussion is really about the VVSG, the standards for the voting machines themselves. And that will help us kind of tailor our input back to the EAC as it relates to the VVSG. So to repeat, Jim, Diane, and then Ted.

MR. DICKSON:

I want to reiterate some things that have already been said; plain language. There are in this country a number of -- a lot of research and real world experience with making things, electronic interfaces accessible to people with cognitive disabilities has been done in many of these. It's not as hard as one might think. In my written testimony, I referenced some places that can be turned to as resources.

I also think that it is extremely important to listen to what the voters say. And the cognitive disability community has made it

clear that what they would like to see is party icons on all ballots and NIST and the TGDC have been less than responsive to that request.

DR. KING:

Okay, thank you. Diane and then Ted.

DR. GOLDEN:

It's a motor task up here. A couple of follow ups that will reemphasize many of those points. A lot of the general usability guidelines suggestion directly address people with cognitive limitations. And when I say cognitive, I mean a whole range of things from global cognitive limitations to all those people with reading limitations with perceptual and information processing limitations which can be visual processing, auditory processing, a large group of people.

And the mantra in our office is user selectability, user selectability, user selectability because as Gregg pointed out, a lot of these features that help one person are not advantageous to another and the most effective way of making sure those people can utilize a piece of equipment is for there to be a variety of ways to interact with it that they can select based on what works for them. And unfortunately, that complicates the voting system because then you have a whole lot of interfaces and they're all usable selectable and the voter has to be much more savvy about being able to pick how they interact with it. It's almost impossible given the paper ballot because what you can do electronically with multiple interfaces you cannot do with paper.

So I think those are the challenges of trying to address people with cognitive limitations across the board is that the things that you do typically involve a whole variety of ways of manipulating the information input and output with it being user selectable, user directed and that's terribly difficult to do given the constraints, you know, that you have with voting systems.

I would suggest, however, if you want some general ideas of what those features look like, Noel had mentioned Kurzweil. There are tons of programs on the market, Read and Write Gold, Solo, Read Out Loud, Win, just the field has exploded recently in the kinds of products that are predominately used in schools and educational environments by kids with "dyslexia", kids with autism, kids with high functioning Asperger's, all -- ADD, all of the kinds of things that adults have also. And they have wonderful features for highlighting, for visual tracking, for bordering, all of those kinds of features. They're all in those software packages and I'd be delighted to pull off a set of those features and share them with people, but again, the hitch is they're all user selectable because what works for one person with one kind of dyslexia does not work with another person with "dyslexia". So I think that's the challenge with deploying some of these within the voting system requirements.

DR. KING:

Okay, thank you. Ted, then Phillip, then Noel.

DR. SELKER:

We've heard a lot of people saying the same things over and over again. Redundancy is one of the top things that helps people that

are having trouble understand things which we all are. Feedback is a second one, and viewability helps and structure helps. Okay.

So what I'm surprised by in the experiments I did in reading disabled people is that people that know they are reading disabled do better than able bodied voters in some ways. We have lower residuals in -- on some equipment quite completely and statistically significant with people that knew that they had reading disabilities and we have documentation for it. That's one of the reasons I asked for in tests, people testing people for these problems because you find a different population in the self, you know, that Jim Dickson is kind of out, you know, these guys are a little bit outside the box compared to most people with disabilities.

And it's the prosthetics that get us all the brilliance that we have because we all have disabilities. And so, you know, we have to want to be heard. We heard Gregg talking about having to want, you know, having to want to vote. Having -- believing your vote is going to count. Those are important prosthetics for voting correctly. I watched that in Chicago where the same procedure was applied to one population I watched which had 5 percent of people employed and another part of town where I watched where everybody was really very -- doing quite well. You'd be amazed how much faster they go through the whole process. Was that because they were smarter? I don't think so.

So I think that the -- that we have to think about these prosthetics that we provide and hopefully don't give people a smorgasbord where some of them work for some and some work for another. But some of these things that we're saying and you

hear us saying over and over again do work for everybody and help

everybody and those are the ones that we really can build a good

portfolio of that will solve a lot of problems and, you know, here's --

you know,

I was asked to write about people voting with dementia; 6-

1/2 or 7-1/2 percent of registered voters have short-term memory

loss. And I was terrified at first. I thought oh, my God, it's all about

assessment. Well I wrote a paper saying it's access not

assessment. And guess what I found? It's the same things that we

needed for these dyslexics that we needed for other cognitive

disabilities, redundancy, feedback, and viewability that help these,

this population, too.

DR. KING:

Okay, thank you, Ted. Phillip, then Josephine.

MR. PEARCE:

Thank you. I think probably there's maybe an implication in this

question that would have to be clarified because if the question is

are cognitive disabilities fully addressed both in the standard, I don't

know if we can answer that question. If the question is at some

level are cognitive disabilities addressable in the standard, yeah, I

think that there are at some level capable. The problem is where

do you draw the line? And it's the same question that we have for

any disability is can you address all disabilities in every way

possible in a set of standards? And the answer is probably not.

We don't have enough paper to write that standard. And so that's, I

think that one of the issues that we have to deal with is the fact that,

yes, we can address cognitive disabilities to a certain level, but

there's going to be a certain level beyond which we simply can't do it. There's no way to write a standard that matches every single cognitive or any other kind of disability completely.

DR. KING:

Okay, thank you. I'd ask that the folks who have their cards up now which would be Josephine, Gregg, Jim, and Noel that this be the last ones for this particular question so that we can stay on schedule. So Josephine and then Gregg.

MS. SCOTT:

Thank you. The question of information design, the question of borders, et cetera, and there's another area that's easily articulated is error messaging and instructions in general. Guidelines for that have already been developed. Now they are available at vote.nist.gov, Dr. Ginny Redish developed those guidelines. And they would provide a significant starting point for meeting a reasonable measure of those. I certainly agree that trying to encompass all of them will be difficult.

And one of the largest difficulties to the question of having a symbol for every party on the ballot, that problem already exists. And bringing forward my experience an election official, it was my responsibility to have the third party provide their symbol, but the quality of the symbols were often not particularly strong. And I strongly doubt that they would have provided much assistance to some of the individuals who are looking for that assistance. They might be low literacy, dyslexic, et cetera. So there's a question of sort of educating the parties to provide even the two major parties to provide a symbol that provides an adequate guidance. They're

looking to promote their -- well let me put it this way they have a different goal than providing assistance to people who may have a cognitive disability. So we would, in fact, have to be managing that process as well in the standard.

DR. KING:

Thank you, Gregg, and then Jim.

DR. VANDERHEIDEN:

Just briefly. One of the things that NIST pointed out is whenever you add lots of options you add complexity and but there are ways of doing it that don't. For example, you can on many devices do things different ways. You can use a keyboard to do something or a mouse. You can have something that has the ability to operate a couple buttons at the bottom or to reach up and touch the screen. And that doesn't add complexity. What it does is people do whatever's obvious to them and they both work. So there are ways of making things a little more flexible without adding "modes" so that people can do the different kinds of ways. So this is one of the things we need to keep in mind.

Again it's -- there are ways of doing things that are better than other ways of doing it. And unfortunately today, I think that not enough time is being spent actually doing the research into the different ways and documenting and getting some data on which ones really work well so that the manufacturers can draw. And they've also been trying to move too fast in some respects. You know, it's like can I quick make something, you know, in two months, three months so that I can get it through certification, so I can get it -- and it's okay, I guess but we need to be also looking at

running in parallel with what we need to do right away. Taking the time to not say well, it's no use funding research on this it will be all over by the time the research gets done. This isn't going to go away. We are having a graying United States and we need to be looking at this more conservatively. Thanks.

DR. KING:

Thank you, Gregg. Jim and then Noel you'll have the final word.

MR. DICKSON:

I want to point out two things here. When Ted referenced the study with people who know that they have learning disabilities performing more accurately than the general public that is true. The same study found that people who do not know that they have learning disabilities or who have never been trained on how to accommodate their disability do worse than the general public. And we are talking about a lot of people. The number of people with a cognitive disability, fit into the cognitive disability class that Diane described a minute ago is huge. It is much, much larger than the low vision community amongst others.

When we -- I've looked at a lot of paper ballots that have not been counted and there are certain patterns of errors or of voter activity on the paper ballot that correspond to certain types of disabilities. You know the person who is compulsive circling the oval, drawing a line over to the name, writing the name of a candidate in, ultimately not getting their ballot counted, you know. That's a person who clearly has a compulsive disability. So I think this whole question needs to be lifted up because it affects hundreds, it affects millions and millions and millions of people.

DR. KING:

Okay, thank you, Jim. And Noel?

MR. RUNYAN:

Well as Phillip had said, there's a question about where you would draw the line on how much you want to do and that also impacts as Diane was saying. You can end up with trying to load in certain accommodations that are impairments for other voters. And one of the things we did in our top to bottom review in looking at the different -- at the requirements of the 2005 VVSG and trying to assess the importance of a failure on a particular requirement was they weren't all of the same weight and we ended up using one measure which was would it ultimately result in somebody being disenfranchised? Would it just prevent them from being able to complete the ballot and complete it accurately at all? And I think if we can develop some measures like that for some of these possible requirements, we might consider or possible innovations and try to measure those against some of the others in terms of whether they really get down to core essential things like being able to complete the ballot.

DR. KING:

Okay, thank you. I'd like to move onto Question 7. And it speaks to the issue that I've heard here as a theme which is yes, the VVSG certainly is the issue before us today, but are there other issues surrounding the relationship between the accessibility and usability communities, the vendors, the testing labs that could be improved not only as a method of improving this standard but improving voting systems which is the ultimate goal of improving the

standard? So the question is are existing interfaces between vendors and the usability and accessibility communities sufficient for proper design and testing of systems and if not are there ways in which it can be improved? And Noel and Jim both have their cards up. I don't know if that is an indication that they want to speak? I assume that Noel...

MR. RUNYAN:

Mine's higher.

DR. KING:

And his was first so Noel and then Josephine.

MR. RUNYAN:

Go ahead.

MS. SCOTT:

Are you sure? The user center design process would have the experts and the various subject matter experts involved in the process of design from the beginning with a -- beginning with a clear understanding of the users. In this case, that would be voters. So in this respect, it feels as if there may be a really strong approach to the design of voting systems would include sort of a multi-disciplinary process because we are talking about expertise that doesn't typically exist in one individual; human factors expertise, software interface, usability expertise, accessibility expertise, and cultural expertise. I think we cannot overlook that piece as well. That's not one human being, that's a group of human beings. And let's also not forget designers. An amazing designer would be of tremendous assistance here and that's often not the same person as well.

So we're out there and we, you know, would encourage folks who are interested in designing voting systems to consider a user center design process that involves a multi-disciplinary team.

DR. KING:

Okay, thank you. Noel then Whitney.

MR. RUNYAN:

One of the things in talking to vendors about why they develop certain features the way they have and sometimes with -- that have left all of us shaking our heads and denying any involvement is that they've typically gone to an organization. And I won't try to attack or defend any particular organization but let's say a major national organization for the blind and asked what do you need on this voting machine? And they get an answer like oh, we have to have a keypad and so they come back with keypad as their only -- a telephone keypad, a telephone keypad as their only solution. If you're only dealing with a single purpose organization like that for your human factors and user accessibility interface, you get very poor answers like that. They may be very focused and the experience has been is they've got very focused on a particular disabilities and particular solutions that -- and from folks that didn't know enough about the other needs of other people with disabilities.

So I would somewhat echo what she was saying because there could be a lot of value from a -- if EAC would help to develop a group of resource folks that vendors could contact. And this would be a resource that could just give them some advice on a particular question they called up about and said well what if we do

a rocker switch or something this way and get some -- it's multiple weigh ins on that from different people. And when they had a system, a particular prototype system they wanted reviewed that -- for feedback early in the design process before they started building anything, they could go this group. Of course this group has to be multi-faceted and it should not be in a position of weighing in and scoring the companies. In many cases they would have to be even under NDA's about things they're working on.

But vendors seem to me to be generally good about wanting to get the input on the design to try to do it right if they can. Unfortunately they so often come in late in the game and put on the access technology or made other usability changes as a band-aid or a tourniquet long after the original product design was out on the market. And that's the worst time to put it on, the most expensive, and hardest to support.

So I'd like to see the EAC encourage vendors to realize this in the first place that this spec should help them realize they need this input in the first place and to help offer up pointers to some of the -- and maybe help build an organization that could be a resource to them.

DR. KING:

Okay, thank you. I've got Whitney and then Gregg.

MS. QUESENBERY:

Yes and yes. Clayton Lewis famously said in one of his books on usability that it's not like peanut butter that you can spread on the surface of your product. I think the same thing is true with quality,

same thing is true with security, same thing is true with accessibility.

　　And I just since we pick on vendors a lot, I just want to mention something that's happened to me over the last couple of years which is I've been getting letters that say hi, I know you work on voting things and you were the President of UPA and I'd like to introduce myself. I'm a usability professional who's just started working at and name a vendor. So I think the beginning -- that evidence that we're beginning to see vendors actually bring some of that expertise in house so that it's not something you go out and get at key points is a positive development and I'd like to encourage more of that. Of course that can only be -- that's something the EAC can do.

　　And I'd like to also mention a couple of requirements in the current VVSG standard that are intended to help encourage more usability and accessibility work done earlier in the process by the vendors and that's the -- John, six, five?

UNKNOWN:

There are six of them.

DR. GOLDEN:

The six requirements for some of the usability tests by the vendors, that's distinguished from the conformance test, the performance tests that will be done by the VSTL's at the end of the process. In a way, this is simply a documentation requirement because all the requirement says is that they have to have done the test and they have to have reported it in a standardized format as part of their -- the package that they delivered to the VSTL's.

So in a way what that is doing is saying we'd like to see the end point of a process that we hope includes good work in a user centered way throughout the process and driving it forward. I assume that no vendor wants to turn in a report that says my system failed and did very badly in that test so we're also hoping they would do it early enough and repeatedly enough that they would fix the design problems. The reason there are six requirements is because they deal with different aspects of the system and different populations including poll workers.

So this isn't a problem that the VVSG alone can solve because it's really a question about how products especially technology products are developed in this country at least if not this world right now. And if you don't begin by thinking about the humans who will use that system at the end of the day, what you've got is technology not human centered technology.

DR. KING:

Okay, thank you. Gregg and then Diane.

DR. VANDERHEIDEN:

Yeah, I think that to come off of Whitney's comments, what's most encouraging is when you say oh, and where do you work in the company? And they say, oh, I work in the product design rather than oh, I work in the certification department. So when you find that the only person working on accessibility is in the certification department, you've got a problem because you're now trying to figure out how -- and their job is impossible. They're supposed to figure out how to make whatever it was that was designed pass and is there some way. And sometimes they'll even ask me, you know,

is there a way that you can make this meet the guidelines? And I say you mean by changing the design? No, no, by just -- and so you could interpret this to have met the guidelines.

And so I think that the answer to the question is, is there enough and the answer is well I don't think there is enough? Can it be done? Yes, it certainly can be done. And I think that the way to do it is what I would say is consistent and clear and enforced consequence. Either if you do it you get a positive consequence or you don't do it and there's a negative consequence. To play lip service to it but then in the end to wink, wink, nod, nod is what is a problem because then it doesn't happen and we just sort of keep moving forward.

The fact that it is hard, usually it's always hard for us to do something that we haven't done before. But once you figure out how to do it, the number of times I have had people say well this would be better for all the voters or all the people that we're working with or all our users. Or well that solves a problem we've been trying to solve for, you know, forget disability, this is a good idea. And the answer is well can you erase the first part of what you said and just go with the last? What do you mean forget disability? And this is the kind of thing I think we need to be looking at is again, bringing this in, showing the relationship, and then having people at the other end say well it maybe hard but I think you can do it, they did it over there. And so the best way of having this happen is to have some people who do it right and then it also gets around the, you know, this can't be done kind of thing. Thanks.

DR. KING:

Okay, thank you, Gregg. Diane and then Paul.

DR. GOLDEN:

I'm going to probably reiterate some of those points but unfortunately diverge maybe a little bit from the statement that you're getting calls from vendors that have hired usability experts. I have yet to be aware of a vendor who's hired an assistive technology person. I don't know, maybe there are some out there, but -- and not that I'm necessarily saying that that's to be expected given the profit margin or lack thereof in accessible voting equipment, but that I mean my very direct answer to the question is no, there are not sufficient linkages.

And even after all of these years when I've tried to worm my way into some of these discussions years ago and now I'm sort of getting calls proactively, I have to tell you, I'm still absolutely flabbergasted at things that are so common knowledge to me as somebody who does assistive technology day in and day out. We provide about 8,000 pieces of assistive technology to people with disabilities every year directly and that includes all kinds of computer access adaptations.

So for me, things like switch input and voice input and all of those kinds of things are what we do on a day in and day out basis. And when somebody talks about switch input and is completely unaware of the scanning software it takes to support the switch, the fact that there are 10,000 different switches on the market and, in fact, the sip and puff or the pneumatic error switch is probably one of the least popular that anybody's ever used. It's kind of like these things are just common knowledge to us and yet with the voting

equipment it's taken a long, long time to get some of that information connected.

And I still think we are years and years away from having what I would call a good interface between those two communities and professionals. And I don't know what it will take other than us making a concentrated effort to figure out how to make the connection better between those of us in the assistive technology world, and the vendors, and the rest of the stakeholders when it comes to voting equipment.

DR. KING:

Okay, thank you, Diane. Paul, Jim, and then Ted, you'll get the last word.

DR. HERRNSON:

I want to extend a question just to include researchers. There are several of us here that do research and comparative research looking at different systems, different ballots, and how different people perform on them. And I have to just comment that my experience with the vendors has been overall fairly good. We put out requests for ten, to ten vendors to use their systems and nine agreed. We had to allow them -- one of the deals was they could look at whatever we were going publish ahead of time and many came through with useful and helpful comments that helped our interpretations. We had only one vendor who came in kicking and screaming and who was not fun to play with later but not necessarily all that disagreeable. So I think we need to give some credit to the vendors.

I also just want to make a comment about the research. I think it's very important that research, when research be done on voting systems and ballots and any other aspect of the interface that they not be reported blindly. I think to be good researchers to be good purchasers, to be people who modify these systems, we need to know what system was tested, what it's specs were, a pretty picture would be helpful, otherwise things will not improve. A, B, C, D as the names for systems I don't think are acceptable in terms of reporting research results.

DR. KING:

Okay, thank you, Paul. Jim and then Ted.

MR. DICKSON:

I want to just begin by reiterating what was just said about the need for hard science, research that's measurable and repeatable. But I -- and I want to go back to something that Noel said and take it in a slightly different direction when he talked about the EAC putting together, you know, a network of resources. I think that we have a real problem and that is the money that isn't in the election system that would -- could pay for thorough development at -- both in terms of accessibility and usability. And I think that it would be very helpful if the EAC could think about, you know, what role it might play in the research and development field that might help with the limited funds that the manufacturers have for research and development. And I know that's not strictly speaking in the EAC's charge, but the finest standards and processes in the world are going to suffer when the manufacturers have to implement them on very, very tight budgets.

DR. KING:

Okay, thank you, Jim. Ted?

DR. SELKER:

Well vendors are under tremendous pressures and have difficulty communicating with all parties today. I've heard everybody complain about their relationships with vendors and it's the funniest thing because the vendors, what they're trying to do is simply make a product that works and is -- and supported.

You go to Brazil and what they do is they completely design and test all software and all parts of the systems before they give it to vendors to manufacture. The vendors then compete on manufacturing of that tested approach that is tested by three different parts of the government by the way separate from each other as part of that process. We probably aren't going there, but we do have to think about how to make the incentives that will allow better communication. Because when a vendor talks about a problem, they're not affecting themselves only their affecting the election officials that depend on them, they're affecting their product status, they're affecting their company status. If they're part of a bigger company, they're affecting them. These things are a counter to openness and they have difficulties.

And my experience with the vendors is that they are extremely cooperative. To the extent that they can, they want new results, new ideas, new -- and they want things tested and understood. And they usually will allow their names to be associated with the tests, even though it's a very dangerous

process in their -- you know, because they have and are under tremendous litigation pressures.

Having said that, I really want to reiterate something about research that's been said a couple times. You know, a few years ago, I ran sort of a teaching class on voting technology and I said hey, these assistive techniques what do you think of them? And one of my kids went and tested a scroll mouse with two buttons and compared that with a standard interface for accessibility and got an improvement, you know, faster to learn, less errors, okay? It's fantastic. Well, you know, we published it in a little corner. How does this -- how do we start getting to enthusiastically support, fund, and look to the results of people that aren't so busy trying to get through some, you know, ITA certification process that they can hardly breathe?

And I guess what do I want to say, I guess the other thing that I wanted to say is that, you know, the accessibility community are siloed by themselves and by others. And in some cases, they're abused for their voices to help and speak for a technology system or a solution. And that's not unusual. They aren't the only community that that happens to, but for some reason, the people that are needing accessibility solutions somehow take on this desperate grasping affect which is not the way we do most engineering. And I don't see it as needing to be this long, multi-year road, I think that some of these things are pretty simple and making good guidelines. We can help vendors succeed because they want to, I know they do.

DR. KING:

Thank you. And Gregg, if you could make just a brief comment.

DR. VANDERHEIDEN:

Yeah, just so that people didn't misunderstand Ted's comment.
When you were talking about the scrolling mouse...

DR. SELKER:

Yeah.

DR. VANDERHEIDEN:

...being -- working better than AT, the AT are designed for people
with severe physical disabilities for example. And the scrolling
mouse of course would be outside of their use. So what you were
talking about more and I ask this as a question, I don't want to put
words in your mouth is in the scroll mouse case, you're talking
about where they like college students or something, I guess, I
don't know, who use the mouse every day and that it was easier for
them to do the voting task using something that was familiar to
them than it was for them to use this different interface for someone
with a physical disability who never uses a scrolling mouse and
who physically couldn't. Their AT which they use would be
something of more in -- comparable. And was it this device you
tested or was it...

DR. SELKER:

One question at a time. The scroll mouse is not used in a normal
way. You do not move the mouse around the table.

DR. VANDERHEIDEN:

No, I'm just...

DR. SELKER:

I'm just -- yeah, okay. The action of hitting a button, left button, right, up and down on the scroll wheel was what we tested. And I'm sure it won't solve all problems for all people. What was surprising is with a small pilot study student running the study we got better results with those four controls than with the nine button keypad.

DR. VANDERHEIDEN:

It was a nine button keypad, right. And I think that...

DR. SELKER:

No, not all.

DR. VANDERHEIDEN:

Physical disabilities?

DR. SELKER:

Yeah, right. But we, you know, these experiments all need follow up and follow through. I mean, you know, you do this for a living and this is one student running an experiment. It's provocative. That's why you're asking a lot of questions about it.

DR. VANDERHEIDEN:

Um-hum.

DR. SELKER:

And I think that the fact is that there isn't a good mechanism for funding these kind of things in place right now.

DR. KING:

Okay, thank you. I want to take about three more minutes before we have a lunch break. The first deals with Question #8 and I'm going to ask that we use Question #8 which reads in your professional assessment from members of the panel, what is your

assessment of usability benchmarks in Chapter 3 of the VVSG? And what I'm going to ask is that those comments be forwarded to the EAC via the website for soliciting comment, I think since this is really targeted towards specific pieces of Chapter 3 that written comments I think will be most usable to the VVSG.

I also want to talk briefly about what we're going to try to accomplish when we come back from lunch. After lunch, each member of the panel will be given an opportunity to make a summarizing statement and on the things that you heard here today, what did you consider to be most important and forwarding that advice onto the EAC as they look at the draft of the VVSG. And I wanted to use as an example the kinds of comments that seem to get the most traction as we move forward in working through this. And I forget, Diane, I think it might have been you who said paper handling standards are not clear in the VVSG. Those are highly actionable items for the EAC in going back and looking at that standard and trying to understand do we need to develop the metrics for the test, et cetera.

So the more that we can kind of focus our comments back towards the VVSG, I think the easier it becomes then for the EAC to incorporate those comments into the larger discussion of how we can resolve the draft of the VVSG that's right now working its way through the channels.

So I'd like to adjourn for let's take, I guess we have a dining facility out here. How about if we can reconvene at ten minutes after 1:00? That's 50 minutes for lunch. I don't think this room will be locked up so it will be important to take with you anything that

you have concerns about. And let's reconvene here at ten minutes

after 1:00 and we'll start on the summarizing portion of the

program. Thank you.

<center>***</center>

[Luncheon recess from 12:22 p.m. until 1:29 p.m.]

<center>***</center>

DR. KING: Okay, thank you everybody for rejoining the panel. And I

apologized earlier for running a little bit late for lunch but we are

going to try to stick as closely to our schedule as possible since

many of us have flights that we have catch out this afternoon.

This portion of the panel is given over then to allowing the

panelists to summarize either statements that they made or

statements that they heard made so that into the record and for the

benefit of the EAC the really important issues are identified to go

forward then with the review of this version of the VVSG.

And as I said before lunch, what we'll do is we'll start with

Phillip and we'll work our way down the line and we'll end with me

and then with Brian. And so Phillip, if you would? Oh, and one

more thing, in terms of timekeeping if somebody starts to go on too

long, I'll probably say one minute and that's just a cue that we need

to start winding up. Thank you, Phillip.

MR. PEARCE:

Thank you very much. And I think that hopefully my remarks will be

fairly brief. But there are three things that I would like to bring out in

my closing remarks. First of all, I would like to reinforce some of

the comments made earlier about -- and request that the EAC

consider, strongly consider development of poll worker user guides

that relate specifically to accessibility and usability. I think that that would go a long way toward bridging that gap between the standards and what's actually an implementation and actually is usable and functional for persons with disabilities. And so I think that that would be a very helpful thing to have happen.

The second recommendation that I would have in summary remark is that the EAC consider developing and coordinating some sort of conference or workgroup or something of that nature that incorporates a lot of the -- and brings together a lot of the stakeholder groups that would include manufacturers and test labs and consumer groups and sort of a design type of a workgroup to be able to make sure that everybody's on the same page and speaking the same language, because I think in a lot of cases that's what we wind up having a void in is that everybody is not thinking the same things, everybody is not interpreting the same way, and so I would like to see that sort of thing happen.

And then the third point that I have is that I want to express my gratitude to this group as a group of panelists because I think that what you've come here to have done is to have provided some very constructive remarks and criticisms and that sort of thing. And I think by and large, you recognize that what the current VVSG is is a very honest and sincere effort by the NIST and by TGDC to develop a set of guidelines that will stick very closely to what was intended in HAVA but will also result in something that is as functional as possible. Is it something that's going to be pertinent? And the answer is no, it's not. I will take -- I'll go out on a limb and speak for everybody at NIST and everybody on the TGDC and say

that there's not a single person there that's going to tell you that they think this is the absolute perfect document. The question is could it be more perfect? The answer is sure we could spend another fifteen years working on this document. And what we would wind up with is fifteen more years where we don't even have the accessibility and usability that's built into this one.

So I think it's important that we go ahead and try to do as much as we can with what we have here and provide that much guidance and then hopefully then in the future perfect it some more. I'll tell you that if we worked another fifteen years, the people that worked on that document will also say it's not pertinent. So what we have to do is to ensure that we try to improve. And I think that this is a much improved document over what was there before but that we work with what's -- the improvements that we have with the idea that sooner or later we will probably have to improve it some more and we'll look at this one and think what were they thinking? But that's okay. It's okay to be able to look back and to have opportunities for improvements so -- and again, I appreciate the opportunity to participate in this panel. Thank you.

DR. KING:

Okay, thank you, Phillip. Sharon?

DR. LASKOWSKI:

First, I want to thank all of you for taking the time out to participate in this panel. It's been really a thrill for me to be up here with people that have -- such intelligent people that have spent so much time thinking deeply about these standards and the issues in voting systems and doing research to supplement that deep thinking. And

I found it even today very, very valuable to hear some of your comments in this kind of forum all together. And I took notes. I'm sure some of the other NIST people took notes we will take home some new opinions and ideas on where we can improve things somewhat. We also have our own lists internally of other improvements ambiguities, et cetera that we found as we've started to develop test methods for this VVSG.

And please send us your comments, feel free to call me to discuss issues that you're thinking about or email me, put in your comments on the EAC website, and we will continue to listen to comments and try to improve things as best we can. Thank you.

DR. KING:

Okay, thank you, Sharon. Jim?

MR. DICKSON:

I want to thank the EAC for pulling this together. I think it's been very helpful and I think in general the EAC should be commended for creating venues for conversation. And I want to thank my fellow panelists as well.

There are two I guess, three things that I want to recommend. One I want to emphasize that there needs to be a best practice that says when testing, certifying, and selecting equipment in terms of disability access and usability it needs to be real ballots that reflect the complexity of the ballot in the local district. I think the question of how long it takes to vote on this equipment is something that we often lose and, you know, from the point of view of what happens in the real world. That's very

important and the corollary to that is the -- is making sure that it is easy for poll workers to set up and use, take down.

I want a second the point that Phillip made about asking the EAC to find some venue or way to bring together design manufacturers, test labs, researchers, accessibility experts for, you know, for a broader conversation and reflection specifically back on the VVSG II.

My third point is -- hasn't been mentioned at all today but I think it is extremely important. It's really fundamental to what we're doing. To state it bluntly, unless there is more sizeable amounts of federal dollars put on the table for buying new equipment, I'm afraid that this version of the voting system guidelines is going to turn out to be like all of those city and state accessibility reports that were done after the passage of the ADA where it's a plan that just sits on the shelf. Money makes the world go round and money certainly is essential to the survival of the manufacturers.

And I think that it's important that one of the lenses through which the EAC should look at its work, it's not just finding the facts and developing consensus on them. It needs to be how do we build a constituency that will support getting the funds into the election system so that we can have a system that people will have confidence in? When you look at all the problems, not just the equipment problem, but the poll worker problem and limitations on -- that election offices have in general, you know, until we can provide resources to do this right, we are going to have 30 percent of the population not having confidence in our elections.

I'd like to point out -- I'll end by saying that Glen Newkirk just released a major study. It's the fifth year he's looked at voter confidence. It's on his website but the remarkable thing is he asked the question, do you have confidence that your vote is going to be counted if you vote on optical scan? Do you have confidence that your vote is going to be counted if you vote on a DRE? And a world class polling company reports back, that 70 percent of the people who vote on DRE have confidence and 30 percent don't. And 70 percent of people who vote on optical scan have confidence and 30 percent don't. And that tells me that the -- it isn't the methodology but it's the whole system that is the source of public doubt and confidence. Thank you.

DR. KING:

Thank you, Jim. Diane?

DR. GOLDEN:

I just have two quick suggestions, I think summary comments. One is that it would be terribly helpful to have and maybe this is just me talking. I just...

DR. KING:

You brought down the house.

DR. GOLDEN:

Okey, dokey, never mind. And maybe this is particular to me because I tend to be a prolific comment maker and I'll apologize to the NIST people right now, but some of those comments clearly after having conversations today with folks, it would have been a whole lot better for us to have a conversation because either I wasn't very clear in my written communications or there were some

missing pieces of information there. So I don't know if there's a way to do something that's more conversational during development process perhaps that would prevent us from getting so far down the line where you've wordsmithed a standard to the point where you think you've wordsmithed it and yet there's some underlying problem there that's reeking havoc from my perspective on accessibility and it's more of a wording issue. So I don't know if there's some way of perhaps building in some of these kinds of activities or even something less formal than this along the way perhaps to keep from expending a lot of resources and getting to a point in time where, yeah, there's been a miscommunication almost down the line.

And in terms of specific comments, I am not going to walk through all of them. There's a whole lot of them on your online system and anyplace where I didn't provide you with suggested revised wording, I'd be glad to take a shot at it, just let me know. But again, I think that's one of those things that if there's some reason that I'm misunderstanding or my suggested wording doesn't make sense, if we could just have a conversation, that would be helpful.

The other thing that has occurred to me in listening to this discussion which is a real concern on the part of the disability community, I think at large is I work, provide technical assistance services to NDRN who has the contract, the HAVA section whatever 269 contract to do advocacy on the part of voting for people with disabilities and those people in the protection and advocacy agencies out in the states are doing work with local

election officials, working with disability communities trying to further voting accessibility at a state and local level.

And one of the things that we keep hearing back from those jurisdictions is we've already purchased our one accessible voting system. And some of them purchased that one accessible voting system years ago quite frankly and they may have been certified to the FEC access standards and at that didn't really even meet those standards because the ITA's were certifying them and they really didn't meet even those standards. And these people are saying so this is lovely, now I've got the VVSG and now I'm going to have the VVSG II, and yes, everything that's going through certification from some point out must meet those standards, but there's no mandate for my jurisdiction to replace this one accessible voting machine that they say is the one accessible voting machine. And folks are very nervous about even if there is an influx of money unless there's some mandatory upgrade cycle that the one accessible voting machine is going to get left in the dust. It's going to sit there and turn into the grandfathered artifact even when other machines are replaced. You see where I'm going with this.

And it's almost as if what HAVA lacks is what the ADA has or what most pieces of legislation have which is any time you do a significant retrofit, any time you do a significant upgrade, you know, accessibility has got to be up to snuff at that point in time and meet current standards. And I don't believe we have that in the statute. I spend a whole lot of time reading the statute. I don't think it's there. And I don't know if that's something that the Election Assistance

Commission can address or the VVSG can address it in some way but I can relate to you it's a real concern at the local level.

DR. KING:

Okay, thank you, Diane. Gregg?

DR. VANDERHEIDEN:

Again, I want to thank the sponsors of this very productive, very interesting panel. I think what we have is good. And as we move forward and if we're looking at improving it, the thing I think we need to focus on is making sure that's basically easier to vote for all. Plain language, ability to have it read to you, things like this can really help a lot of people who might have trouble. Easier to know if you've made a mistake and this is really key. Again, the -- we talk about the voice confirm. There's other kinds of things that can be done but we really want to make sure that the number of people that -- and the research indicating people who didn't actually vote for who thy thought they voted for and stuff is really kind of scary when you think how we're designing these things. And the -- I know this doesn't cover the ballot but especially around electronic systems there's a lot about the presentation of it that, in fact, would be affected by this.

The concept of user selection and options is very good and as much as you can make those natural selections and not "modes", so you don't have to make it into a special mode to do it but you just have the option of doing it one way or another, that's really good.

We need to make sure that it's easier for manufacturers and others to test and to know whether or not they've passed these

things. And so this -- some of this is information. There's things that people say oh, that's not testable and, in fact, it is. It's just that you don't know how to do that and stuff so we have to make sure. But it is -- it has to be easier for manufacturers and for others to know and to test on them.

Now having said that, I want to quote Albert Einstein who said "Everything should be made as simple as possible and no simpler". And so the way to say gee, this is complicated, we need to make it simpler by just throwing away stuff that's really important. We don't want to do that. But again, we might practice our own plain language a little bit and try to make sure that we really have expressed this well.

The last couple, real ballots. The number of times I've seen somebody saying oh, this is usable by people and they have a ballot and it's got two people on it and two races. And it's the most -- it would take you four hours if you actually put a real ballot into the system but they can run it by. Actually, I would like to see some people who are improving some of the systems actually have to vote in the way they are asking people with disabilities to vote...

MR. DICKSON:

Good idea.

DR. VANDERHEIDEN:

...on a real ballot because they would immediately throw half of the ideas out. Yes, it will take longer, but -- and that brings me to the next point and that is comparative testing. And a number of panelists brought this up. Whenever you just look at one thing, you can either say it's good or it's bad no matter how you spin it but

when you compare them against each other, then it becomes the question isn't do we have the perfect or do we have the best, the question is of the different ways that we know is this, you know, near the top or is this, you know, near the bottom. And this should include testing not only existing but also proposed. Often the voting manufacturers have all sorts of constraints on them as to what their next version is. And if we only look at testing what is instead of other things where you don't have to necessarily have it look exactly like the old one with those few changes as possible because you can't afford to change before the next election, we would actually learn more about what kind of interfaces we really want to be heading toward. So I think that the comparative testing ought to be done with those.

And finally, there needs to be funding for the research end. The amount of money that's available to do research on this compared to the amount of money being spent. And then you think of the amount of money being spent on the election. And I don't just mean the advertising, I mean by all the states and this is a massively expensive, tremendously important, but massively expensive. And if you look at the amount of money that's actually available to do research on it, it is non-existent. And it is no surprise that we are fumbling our way forward. There is a lot more that would be known if we did some of this. Thanks.

DR. KING:

Thank you, Gregg. Ted?

DR. SELKER:

Thank you. I actually don't agree that this is a fifteen year process nor that we have a great document. We are in crisis. We are saying that we should specify voter verified paper trail when we don't have any indication that it can be done at better than 5 percent of them being missing. How can we not specify that a system that we are using and mandating people use in voting is able to make more than one error in half a million? We have to have those kinds of numbers in there. We have to make it so that you're not going to turn elections with the stuff that we're mandating to use because we had some political, you know, mandate that people would come up with.

Remember, the biggest research funds that were committed in the last five years were committed for a project that on its very name said it was about education and dissemination of particular ideas. We had spent a lot of the best academics and researcher's time and money and energy promoting positions not discovering solutions. This has to change. And it's not about more money it's about a perspective that has to change. We have to care about being the best in the world.

If you look at China, in 2001, they outlawed the use of Marksense optical scans. They scan every ballot and they keep a copy of every ballot. When you look at that ballot later on, you know that this ballot may be changed since it was scanned or it wasn't in the group that was scanned. You don't have a missing knowledge of whether it was just that the scan works on the side, the timing marks got screwed up because of a fold. So I think that we really haven't, we have nothing in the VVSG about folds or

about the problems of, the advantages of optical character recognition over marksense. We are -- we have been in the mire of believing that the whole story is about software independence and I put forward it's single agent independence. That is making sure everything is supervised is much more crucial than specifically saying this technology is better than that technology a priori.

In fact, in the VVSG, there is no definition of paper. There's no definition of private. And there's no definition of receipt that I found. So those are kind of important topics given the political realties that we are constrained by in writing and disseminating this document.

However, you know, the most important things that we can do in this forum are to improve our ability to at least set the stage for performance based standards where we give good references for the data that we put into the document or we have exemplars for how we do the experiments and we have and we help the readers of it.   We've used the word plain language over and over again. However, there are many issues about the way the VVSG is written where in service to trying to be -- to communicate simply. There are three introductions at the beginning of it. You know, there's a short one, and a little bit longer one, and a little longer one. You read the same material over several times, it doesn't make it simpler to understand.

We have to -- you know, and I want footnotes. When they're using these, all of this terminology, we're all very used to. We want this VVSG to be loved, be loved. We want the election officials to use it, find it, refer to it, mark it up, you know, and I don't think we're

there yet. Now that doesn't mean --maybe we're much closer than all my sad predictions put us. I think we are. I think we're much, much, much closer. I think we know what the issues are. We have, you know, a lot of comments and you guys are grinding through and God bless you. And I'm pretty hopeful that we will figure out a way that when we define something like innovation class, there is a way we have not constrained it as we did in this one to be -- follow every single other requirement that we have plus put on your own constraints. Okay, that isn't innovation. That's a way of making it impossible for anybody to try out something we haven't thought of.

And what's really concerning me is that we are not the head of the world in election equipment or testing or development, okay? There are things we do better but not many. Most places are more experimental and some places have much better technology. There are places like Brazil where they work very hard to work across hundreds of languages with their voting equipment. Yes, they have images that the people look at. Have they had trouble with those images that they put into their voting systems? Yes, they've had those problems, too. Are we looking at it? How many of you have ever gone down and visited with the people at Surti [ph]? Oh, I'm sorry. How about the people in Astonia? Oh, well we haven't -- so we have to go out and meet our colleagues. There's colleagues all over the world that are working on these same problems.

And I think that we have a chance and we should take the leadership position in creating the voting technology that will help the world understand how to run democracies.

DR. KING:

Okay, thank you, Ted. Paul?

DR. HERRNSON:

Well thank you all for inviting me and it's been a learning experience for me. I appreciate being here. This is a monumental document. It's huge. And I'm sure there is lots of feedback going in. My feedback is part of the Brookings Project so you'll get all that. A lot of what I was going to talk about has been said so I'm going to take a little liberties and repeat some of it, but also go beyond the question of the document and the standards.

And one thing that I think it's important to pay attention to that we haven't talked about much is the interaction between different voting systems, different ballot designs, and the backgrounds of different voters. When voting systems and ballots interact, they do not have a uniform effect. We found in our research for example that different types of ballots don't have that much effect on accuracy on the touch screens but they have a huge effect on other forms of DRE's and on paper and paper op scan systems.

I'll sort of reiterate what Gregg said but using my dad's words. He was a football coach, kiss, keep it simple sweetie. And that should be for voting systems and ballots, as well as, the VVSG review and the VVSG document. In some areas there will be some challenges though. Ballots are in some ways difficult to change.

There's statutory requirements, some things that we documented that were difficult like voting for more than one candidate in a race. Well that's required in some state's constitution. And even the presentation of the ballot, whether it's all visible at one time is statutory and even things like a straight party option is statutory and I think...

DR. SELKER:

And different in different places.

DR. HERRNSON:

And different in different places. And I think it's important that legislators are told that this is your law but it really complicates things for your election and you may lose in particular because of this issue.

I guess my penultimate comment would be that there's a lot of information out there and it's really unfortunate that it's unknown to so many people. I had an interaction with someone at Cuyahoga County who didn't like the fact that in his mind I broadsided him with research that's been out there with five years and presented for five years. And I said well, you know, you can blame me but the information was there. Maybe there needs to be more of an emphasis on getting information out to local and state election officials so they can look beyond their immediate experiences. They can look beyond the politics of the issue and maybe see the research. And I know the EAC has tried hard to do that.

I guess my last comment will echo some earlier ones also and that has to do with funding for research. I just am finishing up a huge five year project that ate up a lot of time and over a million

dollars. And I think I've learned a lot and I think the members of my

team have learned a lot and I think we can do better research or

continue the research on new systems, but quite frankly, folks,

without any infusion or money, I'm done and moving onto the next

subject. And I think there are lot of people at this table that would

love to really do things that they would help the American people

with in terms of public policy but we can't pay for this out of our own

personal back accounts because some of us are professors.

Thank you.

DR. KING:

Thank you, Paul. Whitney?

MS. QUESENBERY:

Well I'll echo everybody else's sentiments in saying how interesting

this day has been and thanking the EAC for setting it up.

I guess I've had my say so I'll keep this pretty brief. My say

is largely concentrated in the 50 pages of this large document that

constitute Chapter 3. I point out that it's a very, very small piece of

this puzzle and I'd also like to compliment the people from NIST

who worked very hard to make the requirements that we wrote

clear and readable. I know this was not an easy thing and a lot of

effort went into it and I hope it was successful.

I think one of the things that we did as we thought about

how to construct these standards was to try to put together the

design requirements, things that will encourage good process

development at the manufacturer's side, performance testing, and

end to end testing of the entire voting system in as balanced a way

as we could so that when you take the whole thing as a package

we have something that will hopefully not be one of those standards that can be met in the letter and fail to meet the spirit of the goal of that standard.

I know that there's probably a lot of consternation. It is a very long document, I say having had to read it several times. I hope that I guess if I have one thing to urge the EAC to do, it is to adopt it. That we actually don't -- and I'll be completely selfish that we adopt Chapter 3, that the work that went into producing this version of usability/accessibility requirements was substantial. I think we did a lot of work with the community. The various community is trying to make sure that we had good input and that we not lose sight of that. I know that a lot of things in it are new for people. New things are always scary, they're always hard, and they always require education. We need to do that work to help them whether that's the VSTL's or the manufacturers, or the advocates, or the voters, or us or the researchers. We need to do that work but mainly I hope we adopt it.

DR. KING:

Thank you, Whitney. Noel?

MR. RUNYAN:

Well I feel like a record saying thank you for having this and doing all of this work. As someone at the start of the summer who is suddenly immersed in the 2005 VVSG to be used as the standard for testing, I was totally overwhelmed with the 2005 VVSG's inconsistencies and problems in that, but yet it was a huge document and a huge step forward from where we were before.

I was frankly, just initially just totally stymied because here I was responsible for coming up with measurements for -- that were going to be used to help certify or decertify the voting systems in California and we had no standards around this country here that we could really use. We didn't have any protocols that we could address.

And what I see that is great work the EAC has been doing is pulling together this testing regime with the help of NIST and so many of the rest of you here. And I just looking at our own attempts to try to do some kind of a test for these systems, I have just tremendous appreciation for what you're building here and where that's going to help in the future. And so that the kind of tests that we had to do in California won't have to be done by states and that we'll have a testing system that is -- has the kind of integrity and the results that we'd all like to see.

Now the fact that we had voting systems that got through previous test systems which just atrocious errors as Diane was mentioning. She didn't use the word atrocious but many errors that got passed the AITL systems. And I think that it's essential to build up this base.

Now I'm not beating up vendors here because I understand that in trying to design this, vendors have been just at a loss of how to address a lot of the accessibility and other issues usability. And that I can't blame county clerks for buying the systems that -- because we can't say they should have known better. Their primary input in much of this area was vendors or else a small cadre of people with -- of -- in the local disabilities community that

they called together and said well what should we get? And those people may have seen one or two systems and made judgment calls based on their own personal interests.

So we're -- I think we're moving from a system that was that dysfunctional with these standards and I would like to see a way in which the VVSG doesn't -- won't come out every five years or four years or whatever, but that there can be updatings to it that could have the same strength as the full released versions that you have. I think that waiting as many years as we've had to between these versions has been really hurtful where we have vendors sitting around saying well, you know, what should we do? And people trying to demand improvements and not knowing if they're ever going to get them. So I'd like to just really encourage that, some simplification in the process of updating the document as you move on with it.

One of the things that really worries me on the document is it's a tendency to sometimes over specify technology and we've seen that in laws where once politicians get involved in something, they end up very often making very technology specific suggestions for, you know, dumb things because that's just what they can see right then.

And as was mentioned before, we need something like the innovation class or other ways of having new technologies brought onboard that may not have been anything like what was planned in this. When I was trying to deal with some of our tests, we had problems for example where the one system didn't even have a visual list button. I think the spec is weak on handling situations

like that. I mean it's -- some people will conclude that the -- how did the VVSG do require a visual display to have large print. Others will claim that if it's not in there, it's not required. And so the -- this sounds like an issue that's been discussed, actually maybe not.

Yeah, you mentioned vote by phone. That was my next -- thanks for the segway. We have a number of people that hit us up about vote by phones and shouldn't -- aren't those legal? Are they conforming? And I don't read in this spec very many things that can be drawn towards vote by phone systems either saying they can or cannot be used or what requirements the vote by phone system would have to have.

I'm looking at a reality right now of the very undesirable effects of loss of confidence and what I call confidence in voters, a crisis in voter's confidence, excuse me. And that the answer is becoming the vote by mail. And this has two very negative affects on the disabilities community in particular because of the various forms of coercement and lack of accessibility and when you're trying to do a vote from home, vote by mail kind of systems that we don't have good solutions for accessibility much less even verifying it. Are votes -- if we're trying to work from these vote by mail type systems. And not that all of us are weaklings, but many people with disabilities are easier to take advantage of, and I want people to be careful how they misuse that statement that I just made. Some people perceive that they're easier to take advantage of. And so be more likely targets for intimidation on vote by mail and

home voting kinds of systems. So I would like to see this spec expanded some to address that area.

The one particular general section that I have a problem with and we had tremendous troubles with it during our testings both in the summer review and the fall reviews was the mobility access clearances section of this. This looks to be just fully lifted just from the ADA and has several of the same problems. The wording in there is extremely unclear. We were speaking of what about wording will simplify these systems most and the cognitive advantages of it. We really need to keep it simple in that. And we had several people make just totally screwed up mistakes on the clearances things. And among other things, there is the first one of your clearance specs is that the access area. And that's something that is for somebody to bring in a wheelchair or be able to get it at the machine. That's not a vendor design spec for their machine. It's really a polling place procedural set up issue. And those are the kinds of things that have just been sort of lifted and dropped into this spec figure.

You also have spec in there under the manual dexterity about 5 pound force. And I've seen that used in ADA and other places, 5 pounds of maximum force. Five pounds is a ridiculous number. And I would stand up right -- today and say I think somebody made a mistake by a factor of 10 in that and missed a decimal point that 5 pounds of force for operating something, I mean imagine picking up a couple of quarts, I mean, well a half a gallon of water, a little more than half a gallon with one little finger

but that's all you have to control, that much force. Somebody has made a mistake and it has been repeated in two documents here.

Those things we do need to try to clean up in this and that will take some work to reword. But I don't want to go on because it's getting too specific and I would just wrap on that. Thank you.

DR. KING:

Thank you, Noel. Josephine?

MS. SCOTT:

I thank everyone for this opportunity for express my passions as well as with my thoughts about Chapter 3. One of the observations I've made from this discussion is that it's clear that Chapter 3 touches on the intersection of usability and accessibility. And the thing that makes me feel heartened is that no one is saying it must be one or the other. It feels as if we do have an understanding that the right answer is both of them. And it's a design issue that we can resolve.

The standard -- we had a discussion at lunch about what a standard should be. And I have to give my compliments, Chapter 3 does, in fact, do a very good job of avoiding design dictates for the most part. There may be some instances and so forth but it provides the benchmark without deciding the correct answer with a couple of exceptions that I think were mentioned here today. So I want to give my compliments as well and let me say that it gives me great hope because we've been looking forward to that sort of standard for almost a decade now. Time passes quickly so my congratulations. Thank you.

DR. KING:

Thank you, Josephine. Before I turn the microphone back over to Brian for the closing comments, I'd like to just share my perspective on what I heard here today with the panel and with the audience.

I heard that in the future that aging issues may lead to a blurring between the delineation between usability/accessibility and just universal usability of systems. I heard security experts should not represent themselves as accessibility experts. I -- that what is cutting edge today in terms of accessibility will be routine standard practice in the future and we should continue to invest in research for that reason alone. That due to the discrepancy of the time that it takes to cast ballots that the testing metrics should include real world ballots, complex ballots and fully exercise that feature. That we should look for one switch turn ons for devices to decrease the complexity of their use. That we should learn from industry best practices in terms of what other industries outside of the voting industry have learned and implemented on usability and accessibility. That plain language is an important criteria that benefits all dimensions of the standard including usability and accessibility. That to mandate paper in the standard as far as the software independence is confusing. That the standard for the audio feedback, I'm sorry, audio read back and then paper ballot is inadequate in the standard. That the protocols for the usability and accessibility tasks being developed by NIST but will need expertise for their implementation at the lab level. The test labs will need assistance in training staff in order to interpret the metrics and design and implement the test. The component testing could be advantageous perhaps, the extent to which the component impacts

core function should become a criteria for inclusion of component testing or requiring persistent testing. That standard interfaces are needed in order to promote this component testing. And I have plain language more than once in my notes. That the criteria for testing of adaptive technology devices can include or should include will it disenfranchise a voter. It's a very simple metric, easy to understand, but perhaps we'll need more detail in order to become testable. That expertise does not exist in a single individual for many of the issues that deal with accessibility. That resource group be identified by the EAC and made available to vendors and that the group should be multifaceted. That there is not sufficient linkages between the usability and accessibility community and the vendors and that researchers should be included in this mix. That possibly the creation of a conference where the stakeholders, usability and accessibility stakeholders to create a consensus of language and an interpretation of that language. Connecting the standards to the behavior of poll workers and voters beyond just the vending. We need more dialogue in the development of a standard perhaps less formal documentation between stakeholders and more informal conversation. That accessibility may be more volatile than the current timeline of our standards permits so that when innovations become available we need to find a method of taking advantage of those innovations. We should emphasize the best perhaps more so than the perfect as we move towards the next standard. That funding for research is critical to continue the development of the state of the art which will lead to the state of the practice. We've spent time and money

perhaps too much promoting positions in the past as opposed to promoting research. That the readability of the draft of the VVSG can be improved for all parties. That the U. S. may not be a leader in the world in the design of voting systems. The standard should be updatable without the need for the sometimes Herculean efforts that it takes via-a-vis the 2005 and now the 2007. That the VVSG draft sometimes over specifies the methods of implementation. And that vote by mail or other vote by home schemas may have serious negative implications for the disability community. And that finally, mobility testing protocols need greater clarification.

So as I sat here, I stood here today, as I stood here today and I listened to this panel, I came away with about fifteen pages of notes of things that either I had not thought about completely or not thought about at all and I thank the panel for their contributions to this effort of the VVSG.

I'd like to now turn it over to Brian Hancock of the EAC.

MR. HANCOCK:

Thank you, Merle. And I want to say my own thanks on behalf of the four commissioners and our executive director for all of you spending your valuable time coming here and sharing your thoughts with us. We as you see we have notes, we have transcripts. In fact, I want to remind you that the transcripts for this and for all of our roundtable discussions are on the EAC website as soon as we get those in a format where we can post them so you can go back and read what you said and perhaps let us know whether they're correct or not.

MS. SCOTT:

Oh, I didn't know that.

MR. HANCOCK:

Let me also -- yeah, but no deletions. Let me thank Merle once again for his yeoman's work in moderating these panels. I don't know whether he begins to find them easier or more difficult as we go on but in any case, a great job again. I want to thank Matt Masterson of the EAC staff for putting this together and all the hard work there.

And I just want to close by reminding you of a few things related to this project. This is the fourth in our series of roundtables. We have three others coming up very shortly. On April 24 at the EAC Offices here in Washington, D.C., we're going to have a roundtable discussion with members of the voting advocacy community. The very next day on April 25, we're going to have a roundtable discussion with election officials. And finally, on May 5 at the EAC offices, we plan on having what we're calling an interdisciplinary roundtable where we will bring together members, not all the members, but certainly some members from all of the panels because one of the very first things that we heard was that there was a need for not just sort of section specific or topic specific people to get together but for people that are interested in the document as a whole to have everyone sit down and discuss this. So that will be the topic of the May 5 meeting.

And again, just to remind everyone, the EAC is certainly aware of the responsibilities that we have for this document and we understand that this is really charting the course for the voting systems to be used in this country in the foreseeable future. It's

certainly an awesome responsibility. The staff and the

commissioners are accepting that and certainly are undertaking it

with the full commitment to do all our due diligence and getting

input from everyone to make it the very best document possible.

So with that, thank you. Final thoughts to Merle.

DR. KING:

Thank you, Brian. Well again, my thanks again to everybody for

attending, preparing, and participating. And with that, I will adjourn

this roundtable and wish you all a safe journey home. Thank you.

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[Whereupon, the roundtable discussion adjourned at 2:20 p.m.]