MR. EUSTIS: Good morning everybody. My name is Alan Eustis. I’m with the National Institute of Standards and Technology in the Gaithersburg Headquarters. I’m here with the rest of the NIST voting team and welcome the public in attendance. The people that are viewing by Webcast, our Elections Assistance Commissioners, all of our TGDC members that are participating here in person as well as via the teleconference capability and we’ll check on their call ins. We are a little early at 8:56 but I did want to go through just a few logistical issues to start with and we can start on time that way.

This is, of course, our concerns that you understand that we actually have practice here all the time. Somehow at our meetings the fire alarms go off and they did yesterday. I can tell you that they work and what happens is the little strobe lights flash and you will hear a very luxurious woman’s voice tell you “Please leave by the nearest exit.” It’s very
calm and reassuring and as you can see we are in the auditorium. You have two exits in the front. I would ask that you be very careful if you use this exit due to the lift. Both of these exits then exit out through a ramp to the outside and for those closer to the back, you can go out the back doors and right around to either side are exits to the building. Hopefully this time we’ve gotten the fire drill out of the way but we never know for sure. Please turn off your cell phones and pagers. There is no food allowed in the auditorium or drink I should say, as well. Please wear your name badge at all times and for those that are hearing impaired, we have signers over here, stage left, and please feel free to come over here and sit in the second or third row. You will have a better view that way of what’s on screen as well as what your signer is interpreting for you.

For those viewing via the Webcast, it’s closed captioned. I should mention for those of you that are not familiar with this, that the NIST facility here in Boulder there were two signers for responsible in the early 1980's for figuring out how to put closed captioning into the TV. signal and won and Emmy. The Emmy is right outside. I don’t think any other government agency has won an Emmy.
There are a lot of other wonderful things that our hosts here at NIST Boulder have provided for the American public in realms of physics and measurement and, in fact, we have a Nobel Prize winner on staff here and a MacArthur Fellow.

If, at lunchtime, you would like, there is a little history center over to the left that talks about the development of a clock but I would like to say the Atomic Clock.

The NIST staff here has been absolutely tremendous in assisting us in getting ready for this meeting, particularly Wendy Ortega McBride and Zelda Bailey and Pat Trossburger and others. We are most grateful from the Gaithersburg staff that they were here to help us.

I think I have enough presentations for the entire public out front. If I do not, all of the material from this meeting, if it’s not already up on the http://vote.nist.gov, it will be early next week. That includes the PowerPoint presentations. We had a little trouble this morning with one of the copiers but we’ll have that material, hopefully, by the end of the day. With, the end of my introductory remarks, we are going to go fairly quickly this morning, have a break around 10:45 and lunch around 12:30.

For those of the public as far as eating lunch, if you
walk out of the entrance and take a left down the bicycle path you’ll go through a little tunnel and you will come out at a big shopping area with about ten places to eat. Everything from Tai food to Subway to, I think there’s someplace call the Egg and I, which is a pretty good place to eat. So, that would be my suggestion for lunch for the public in attendance.

With that, I turn the meeting over to Dr. William Jeffrey, the Director of the National Institute of Standards and Technology.

DR. JEFFREY: Thank you, Alan. First of all I would like to welcome you. Good morning. I’m Bill Jeffrey, the Director of the National Institute of Standards and Technology and the Chair of the TDGC. We have a very full packed day today so we are going to get going right away. With that, I hereby call to order the Fifth Plenary Session of this Committee and the first thing I would like to do is have everybody rise and say the Pledge of Allegiance.

ALL: I pledge allegiance to the flag of the United States of America and to the Republic for which it stands, one nation, under God, indivisible, with Liberty and Justice for All.
DR. JEFFREY: At this time I would like to recognize Mr. Phil GREENE as the TDGC parliamentarian and request that he determine whether or not a forum of the committee is present. Phil.

MR. GREENE: Good morning. I’ll direct you to the parliamentarian’s memo which is in your workbook. It has an overview of the things that we will be working on today. I will point out one typographical error. In the third paragraph it says “WAC” where, of course it should be “EAC” for Elections Assistance Commission. I don’t think any members of the Western Athletic Conference will be here today. I would like to determine if there is a quorum today and I’ll be calling roll. Williams. Berger.

MR. BERGER: Present.


MR. CRAFT: Here.

MR. GREENE: Gale.

MR. GALE: Here.


MR. GANNON: Present.

MR. GREENE: Harding.

MR. HARDING: Here.

MS. QUESENBERRY: Here.

MR. GREENE: Quisenberry is here. Revest.

MR. RIVEST: Here.

MR. GREENE: Revest is here. Schutzer. Schutzer.

Turner-Bowie

MS. TURNER BUIE: Here.

MR. GREENE: Turner Buie is here. Jeffrey.

MR. JEFFREY: Here.

MR. GREENE: I have determined that we do have a quorum. We have nine present.

MALE SPEAKER 1: We need to find out who is present. Can they call us in?

MR. GREENE: I believe we have a few attending via teleconference and we are waiting on those but I have determined that there is a quorum and I’ll call roll in a few more minutes. I’m going to call the roll again to see if anyone attending via teleconference is here. Williams.

Karmol.

MALE SPEAKER 2: If anyone can hear this is Jim Elekes. You are not coming through on the teleconference line. I
can just barely hear you.

MR. GREENE: Can you hear me now? Testing. Testing. Can you hear me now?

FEMALE SPEAKER 1: No.

MR. GREENE: Calling roll again for Williams. Karmol.

MALE SPEAKER 1: You need to bring your volume up or something because you are fading in and out. There’s not a consistent signal.

MR. GREENE: How about now? Mr. Elekes can you hear me now?

FEMALE SPEAKER 1: I can’t hear a thing.

FEMALE SPEAKER 2: I can’t either.

MR. GREENE: Will you please identify yourselves?

MALE SPEAKER 2: I have the volume on my headset up at about 8 in order to just hear him softly.

MR. GREENE: Can you hear me now? We’ve noted that Eleques is here. Miller. Purcell. Schutzer.

MS. MILLER: Miller is here.

MS. PURCELL: Purcell is here.

MR. GREENE: Purcell is here. Can you hear us though?
MALE SPEAKER 3: I don’t think they can hear.

MALE SPEAKER 4: We want to try to reach Alan because they are having technical problems.

FEMALE SPEAKER 3: I just tried to call him.

MR. GREENE: Calling roll one last time. Karmol, Williams and Schutzer. We do have a quorum and we are going to continue and we are going to work on the technical difficulties of the audio to the persons attending via teleconference. I turn the floor back over to Dr. Jeffrey.

DR. JEFFREY: Thank you, Mr. GREENE. This is a good example of real world technical issues.

Let’s try again. Is it safe? Okay. We’ll try again.

If anyone starts going deaf, give me a hand signal.

First of all I would like to start off by thank you EAC Commissioner Davidson, the former Colorado Secretary of State and member of this committee for the invitation to meet in her home state. I also want to thank the staff of NIST Boulder for helping to make this a good event and finally, let me thank the members of this committee. This takes a lot of time and a lot of effort. This is an important issue and I really do appreciate, and I think everybody appreciates the value that the time and effort you are putting into this
to make it succeed and to make recommendations to the EAC, how important this really is. So, thank you personally and also for the country.

I was sworn in two months ago, actually two months and three days ago as the Director and I would like to thank Rach Smergian who was the Acting Director of NIST and sat in this chair for the first four plenary meetings. He did an excellent job of getting to where we are today. I look forward to hopefully filling in his shoes and continuing the progress that he made.

I am also pleased to welcome a second new member of this group so I’m not the only new person here today. The Honorable John Dale who is the Secretary of State for Nebraska who will replace Secretary Davidson as the representative of the EAC’s Standards Board since the president nominated Commissioner Davidson as an EAC commissioner. And with this we are very pleased that you are here and would you like to say a few words of introduction?

MR. DALE: Thank you Dr. Jeffrey. It’s a real honor to be serving on this committee. I’m looking forward to getting to know all of you better and to becoming more acquainted with the tremendous staff assistants that you have.
I’m Chief Election Officer for the State of Nebraska, Secretary of State since December of 2000 and I’m very, very committed to election reform issues that we are addressing to bring confidence back in the public in our election program. Thank you, Dr. Jeffrey.

DR. JEFFREY: Thank you, and welcome. The Committee is also pleased to have the EAC Commissioners present here with us and we are going to be getting remarks from them and comments from them in a few moments. In particular I would like to just call out the EAC Chair Hillman, Vice Chair DeGregorio and Commissioner Davidson in attendance and Commissioner Martinez was not able to make it but does have some comments that we will read for the record. I would also like to point out Executive Director, Tom Wilkey and Ms. Carol Briquette of the EAC Manager of Special Projects. I look forward to hearing her comments and providing us some guidance as we move forward.

At this time I’ll entertain a motion to adopt today’s agenda for the TGDC. Is there a motion to adopt today’s agenda?

MALE SPEAKER 5: So moved.

FEMALE SPEAKER 4: Second.
DR. JEFFREY: Is there any discussion? In which case I’ll call a vote. Can I just do this by unanimous consent or do you do this?

MR. GREENE: I’ll go ahead and call the roll again. Let’s see how this works this time. Calling roll again to adopt the minutes of the last meeting. Williams.

DR. JEFFREY: Just for the agenda. To adopt the agenda.

MR. GREENE: Williams. Williams is not voting.

MALE SPEAKER 6: Jack. This is Jim Elekes of U.S. Access Board. We are having a technical problem. They are working to resolve it because we are barely hearing them.

MALE SPEAKER 7: Well, now, is the problem coming from your end or from our end?

MALE SPEAKER 6: It would appear coming from your end.

MALE SPEAKER 7: From my end?

MALE SPEAKER 6: Yeah.

MALE SPEAKER 7: Well, okay, I’ve just asked the –

DR. JEFFREY: Is it possible to cut the audio up there while we take this vote? Okay. Please proceed.

MR. GREENE: Berger.

MR. BERGER: For.

MR. Craft: Yes.

MR. GREENE: Craft votes yes. Gale.

MR. GALE: Yes.


MR. GANNON: Yes.

MR. GREENE: Gannon votes yes. Harding.

MR. HARDING: Yes.


MS. QUESENBERRY: Yes.

MR. GREENE: Quesenberry votes yes. Revest.

MR. REVEST: Yes.


MS. TURNER-BUIE: Yes.


DR. JEFFREY: Yes.

MR. GREENE: Jeffrey votes yes. That’s nine votes
for. So the motion is passed.

DR. JEFFREY: Thanks Bill. At this time I would like to entertain a motion to accept the minutes from the last meeting, the April 20-21, 2005 meeting of the Technical Guidelines Development Committee. Is there a motion to accept those minutes?

MALE SPEAKER 6: So moved.

DR. JEFFREY: Okay, there’s been a motion and seconded. Any discussion?

MALE SPEAKER 7: Yes Mr Chairman.

DR. JEFFREY: Okay.

MALE SPEAKER 8: I just wanted to say thanks to the NIST staff. They are exceptional minutes.

DR. JEFFREY: Thank you. Any other. Okay, let’s call the vote.

MR. GREENE: Calling a vote on the accepting of the minutes of the last meeting. Williams. Williams not responding. Berger.

MR. BERGER: Yes.


MR. CRAFT: Yes.
MR. GREENE: Craft votes yes. Gale.

MR. GALE: Abstain. I wasn’t present at the last meeting.


MR. GANNON: Yes.

MR. GREENE: Gannon votes yes. Harding.

MR. HARDING: Yes.


MS. QUESENBERRY: Yes.

MR. GREENE: Quesenberry votes yes. Revest.

MR. RIVEST: Yes.


MS. TURNER BUIE: Yes.


DR. JEFFREY: Yes.

MR. GREENE: Jeffrey votes yes. That’s eight votes for which is a majority. The motion passes.

DR. JEFFREY: Thanks. Okay, let me just give a very brief review for the public in attendance and also those
viewing on the Webcast as to why we are here today. Public Law 107-252, the Help America Vote Act, which you will be hearing as HAVA for the rest of today, established the technical guidelines development committee. HAVA charters the members of this committee to assist the Election Assistance Commission with the development of voluntary voting system guidelines. This committee’s initial set of recommendations for these guidelines was sent to the Executive Director of the Elections Commission in accordance with HAVA’s nine month deadline on May 9, 2005. The EAC issued draft voluntary voting system guidelines for public comment in June of 2005. In the interim the 2002 Voting Systems Standards adopted by the Federal Election Commission serve as the first set of voluntary voting systems guidelines under HAVA. Since the last meeting of the TDGC in April of 2005, the NIST staff in coordination with the three working subcommittees of the TDGC have drafted preliminary reports on issues pertinent to future voluntary standards development in the areas of human factors and privacy, security and transparency and core requirements and testing of voting systems. We will discuss these reports at today’s plenary session.
At this time I note that the latest revised version of Robert’s Rules of Order was adopted on July 9, 2004 to govern the TGDC and subcommittee proceedings. I call on Mr. Greene to review the logistics of this fifth meeting of the TGDC.

Mr. Greene: Thank you, Dr. Jeffrey. I will remind you – can you hear me?

I’ll remind you of what I pointed out earlier, the parliamentarian memo will go over the format for today’s meeting and under Robert’s Rules of Order we will be doing what we have done in the past, considering motions, a motion will be offered. It will be seconded. We will then have discussion and following that there will be a vote and, again, since we have a quorum, we will be looking for a majority of at least eight voting for to have the motion passed. Otherwise, again, it is consistent with how we have had the meetings in the past.

Dr. Jeffrey: Thank you. We do have an ambitious agenda today and specifically as a committee we will review, approve and, where appropriate, provide supplemental direction.

Additional comments and position statements regarding the work of this committee should be sent to voting@nist.gov
where they will be posted on the NIST voting website which is [www.vote.nist.gov](http://www.vote.nist.gov). The comments we have received to date have been posted and reviewed by NIST staff and TGDC committee members. At this time I am very pleased to invite EAC Chair Hillman and her fellow EAC Commissioners to address this committee. We appreciate the Commissioners offer to address the TDGC at this meeting and we welcome their remarks.

MS. HILLMAN: Good morning and thank you very much. I’m pleased to be here this morning. It’s wonderful to be in Boulder. Dr. Jeffrey congratulations on your appointment and to the members of the committee, congratulations on the fantastic work over the last thirteen months. The Election Assistance Commission in partnership with the Technical Guidelines Development Committee has an awesome task and that task has some conflicts in it that have to be resolved in that there is a sense of urgency to provide the very best standards and guidelines that we can possibly provide to ensure the voting public that their votes will be secure, counted accurately and, in fact, counted.

On the other hand there’s a process that has to be invoked to do careful study and development of the guidelines and sometimes that process doesn’t fit within the time lines of
election dates. Sometimes when you are doing standards you can sort of set your own pace but in our case we have election days every other year that must be adhered to, including primary dates leading up to those general election dates and so, it is commendable to the committee that it was able to produce in nine months the guidelines that are currently out for public comment.

The Election Assistance Commission has extended itself through the resources available to us to be out across the country the past four months receiving public comment. We had hearings in New York, California and here in Colorado so that we could receive testimony. At our public meeting on Tuesday of this week we were informed that as of that date over four hundred comments had been received. We expect that a number of people who, like me, on occasion appreciate the reason for a deadline is I have up until that day to do whatever it is I’m supposed to do. So we would expect that a number of comments would come in this week. We have been encouraging people to do that, particularly the vendors who have been, up to this point, a tad bit quiet in their comments on the guidelines but we look forward to hearing their comments as well.
As we move forward the Commission has been looking at the future items in the guidelines to be reviewed and the time line to do that and understanding that this process has never been done this way before and so I won’t say we are making it up as we go along because we are not but we really are trying to figure this out, this balance between producing guidelines in a “timely fashion” and also taking the time necessary to do a careful review and study of the components of the guidelines. As we look toward future iterations, if you will, of the guidelines, my colleagues will address more about the three or four critical deliverables that I think NIST has identified that the work of the TGDC, what that work can produce for us and what the deliverable dates might be. We need to balance that against the needs of the election officials across the country and to provide this information in a way that doesn’t cause undue concern, if you will, that election officials will feel they’ve settled into the equipment that they have chosen and that they have trained their staff and poll workers on how to use that equipment and they have tested it and the fear that some component of guidelines coming out in 2006 or 2007 may alter either what their work plans are or their spending. As we did with this
set of guidelines, I’m pretty sure that we will produce future
iterations in a way that will be useful, provide the
protection and assurances that people need. When I step back
and think about it, it is indeed an awesome task to think
that we are involved in setting up standards for voting
systems that not only will address the technical components,
guidelines for the vendors who produce the equipment,
standards for the laboratories that will test the equipment
so that we can receive, we the EAC, can receive
recommendations on certification but that at the end of the
day an assurance to the voting public that the equipment in
place, the systems that they will be voting on are indeed
providing the kind of protection and assurance that they
deserve as voters.

So, I thank you to all members of the committee. I
apologize that I cannot be with you for the full day. When
I leave here I am finding my way to Kent, Ohio which is an
interesting challenge, from Boulder and so, I will be leaving
at about 10:00 but I appreciate the opportunity to be here
and just want to say on behalf of my colleagues at the
Commission, congratulations on a fantastic job. We look
forward to working with you over the next, over the years.
Thank you.

DR. JEFFREY: Thank you very much.

MS. HILLMAN: My colleague, the Vice Chairman of the Election Assistance Commission, Paul DeGregorio.

MR. DeGregorio: Thank you madam Chair. It is indeed a pleasure to be here. I’ve had the splendid opportunity to be here for the creation of the TGDC. I was the federal officer for the TGDC and be here for every meeting and followed you very closely even at your other meetings that you’ve had. It’s a pleasure to be here in Boulder. You know when I got my USA Today, in my room this morning and opened it there was a whole story about the people of Boulder and how they’ve opened themselves to the victims of Katrina right here in Boulder. They spotlighted a few families. This is a great community and I know it’s a great community for NIST and its employees to work in. We appreciate the work of NIST and what they have done to support the TGDC and to support the EAC since this relationship started in 2004. Its has been a pleasure and it’s a pleasure to have met Dr. Jeffrey and last night we had the opportunity to talk and have dinner with him and we look forward to your leadership. This is a great group of people. I’m sure you’ve realized that in
the last two months. This is a component of the Commerce
Department that I think is, we think is, very important
certainly and I know it will gain your attention.

Secretary of State Gale and I have known each other now
for several years and it’s a pleasure to see you on the TGDC
taking the place of my esteemed colleague Donnetta Davidson.
I know that you will do a great job because I know you
represent the Secretaries of State of this nation.

You know, you all did that great work last year and
delivered us a wonderful product in nine months that we have
now been reviewing as the Chair said. After you did that
we came to this crossroads, okay, what are we going to do
next? So the Commission passed a resolution in May which
I think you all may have seen, about the continuing work of
this committee and I know that’s what is going to be embarked
upon today. You are going to have a lot of discussions about
the next generation and other things that you are going to
do. The Chairman mentioned what we did over the summer and
it’s been very instructive to all of us, including me, as
we received the comments. I know that this process has been
transparent and public all along. You all when you went
through your nine month process had a very public process
that was, your comments were posted on your website for everyone to see and that’s very important here that the public understands that they can participate and as Dr. Jeffrey said, as our Chair said, our first iteration, comment period is going to come to an end tomorrow so we encourage everyone sitting out there to get their comments in. Let me say, just for a moment if he is watching out there, he might be at his desk, Dr. Smergian, just to thank him for his leadership of this committee over the time he served because he served at a time when we really got to the meat of the first generation and it took a lot of perseverance to get through this process which was new to NIST and certainly new to the Federal Government but he did a great job and I hope if he’s out there listening that he understands our great appreciation for the work that he did.

I would like to talk just a few minutes about this next generation and some of the information that we have received concerning the time lines just to tell you our particular feelings about that and I want to bring to your attention the written comments of Commissioner Martinez which I think has been distributed because he could not be here today. He has followed the work of the committee very closely and
has attended every one of the meetings and his comments are very timely and very important so we want to make sure that you follow them. He talks about the IDV and security issues and we want to bring your attention to that.

In your time line you talk about the update to the VPAT, the Voter Verified Paper Audit Trail due in April 2006 and the usability standards in July 2006. I know that we have some election officials on this body who will look at that because it is important to note whenever thing are coming out in an election year, the impact that it may have on state and local election officials and how they deal with it and that if new guidelines are being proposed in an election year and states are going through federal primaries and elections what impact that may have on them they may well attempt to try to institute some of these guidelines in an election year. The vendors may try to meet them but it does have some impact on them and that should be noted.

We note that the next iteration of the VVSG, including a substantial reformat of the document is due to be delivered to the AC in July of '07 and recognizing the time period that it took the EAC to go through our Federal Register publications, our 90 period of comments, our hearings that
we had, this is likely to take us into the late fall of 2007 or early 2008 to adopt these. Again, it’s of concern to me and I know members of our commission and our staff of having to do this and come up with something in a presidential election year, certainly so early in an election year. We recognize that if we take the same posture that we’re moving towards with the first iteration that there will be an implementation period of perhaps a year or two that there is a time period in there for people to come in compliance with it. Certainly if that time table could be moved up in some way that would be helpful.

We have discussed this with NIST and our staff and their staff about releasing components of the next iteration in modules and indeed I think that’s contemplated in the time line that has been suggested. That’s a good thing because I think it does help people move forward, the vendors move forward, getting some idea of what may be coming out. Also I think it helps us to move forward to adopt these new modules as guidelines and so we just want to encourage that kind of approach because I think the earlier the better. We recognize that financial considerations always come into play and we don’t know what our fiscal year 2006 budget will be as you
don’t know and its likely to be, we’ll likely be on a continuing resolution so that might have some effect but we hope that the progress can be continued to be made.

Speaking of the budget, the chair and I were with folks in the Office of Management and Budge this week to talk about our 2007 budget and we focused very strongly on the work of NIST that is included in our budget. Specifically it was Five Million Dollars for the 2007 fiscal year and we are hopeful that the administration will be supportive of our request because we know that this money is going to be put to good use by NIST, by the EAC in improving the election process in the United States.

Finally, I want to just bring to your attention the international implication of your work. I was at a conference of elections officials a couple of weeks ago in Budapest, Hungary. There were four countries represented and they wanted me to talk about the new way that we are institution standards and guidelines in voting systems in the United States. I talked all about the TGDC. We talked about NIST. I had several folks come up to me and saying “oh, we’ve been following your work very closely.” Some of them mentioned the NIST website, our website and many countries are following
our work and actually want to replicate it in their country. Specifically, I had someone from Germany come up to me to tell me how closely they were following these guidelines, these standards because many countries of the world are moving towards electronic voting and the standards that are being set in that area are very important, not just for people in America, but the work that you do has implications worldwide. So, I commend you for that and I just want to make sure that you are aware of that.

Thank you for the great work that you are doing. We appreciate it and look forward to continuing this great relationship and building upon it and providing the American voters with the best election system possible. Thank you.

MS. DAVIDSON: First of all I’d like to welcome you to Colorado. This is still my home even with moving to D.C. I will return to Colorado, it is home and I do welcome everybody and I know the fellow people here from Colorado. You will find that we are very friendly in the west and I’ve already had people comment about how friendly the people have been here. Probably some of them will talk your leg off so, be aware.

It was a great honor for me to be a part of the TGDC.
I want to compliment everybody on the committee for how much work they have done, NIST and the committee members. Nine months is a short period of time to develop what was developed and I really appreciate all the hard work and I know it was hard work for each and every one of you.

I also want to say welcome and congratulations to Dr. Jeffrey. I also want to say John, Secretary Gale, I congratulate you. I think you will make a great member of this committee. I have the utmost respect for you and I know that you will continue to do a great job on this committee. So, thank you for serving. It does take time out of your office but it’s very important.

The other thing I would really like to say, I think by NIST being so open with their process that they have done over, you know, from the very beginning and making sure that people are aware of what’s happening with all the telecasts and the information on the NIST website and I think that that transparency is very important in the election process and I can’t compliment you enough in always making sure that that approach is taken. I think it’s very valuable.

I also wanted to say that I’m very interested in, as we move forward, getting the ITA, the lab people that are
involved with it, and our standards and advisory committees, involved with these segments as soon as possible because I think that will produce the material out to the final product a lot sooner than what we did last time. I think that having it come in segments we can work a lot faster and that way we are not trying to digest such big documents as we did last time. I think having us become more of a team early on, I think that we could accomplish a great deal by working together and we look forward to seeking your guidance as we go through this. We also look forward to working with NIST and after the 30th of this month setting the standards that we have that’s almost ready. It’s going to be an exciting time.

Again, welcome to Colorado. Thank you very much. I appreciate it and I appreciate all your hard work and thanks everybody for being here. I see some of my fellow workers here and clerks and office staff and so it’s very nice to see some friends. Thank you.

DR. JEFFREY: As I mentioned at the beginning, Commissioner Martinez was not able to make it today but he did provide some comments I would like to read for the record and then I would like to ask Executive Director Wilkey to
I would like to express my sincerest appreciation to all of the members of the Technical Guidelines Development Committee and the staff of the National Institute of Standards and Technology. We have a continued commitment to this important project. I would also like to join my colleagues in extending a warm welcome to Dr. William Jeffrey as the new chairman of the TGDC. So, thank you as well as to Nebraska’s Secretary of State, John Gale.

The development of performance standards for our nation’s voting systems is among the most significant responsibilities of the U.S. Elections Systems Commission. As a result of the tremendous work done by NIST and the TGDC to produce the initial draft recommendations the EAC is poised to soon deliver to the American public the first comprehensive update of voluntary voting system standards since 2002. As you begin the process of deciding where to focus NIST staff and resources in the coming fiscal year for additional work in the area of voting systems standards I respectfully submit the following comments for your consideration.

1. Security and Transparency. Earlier this year I stood before this committee and urged that the issue of
security of voting systems be a primary focus of any proposed voluntary voting system guidelines. I would like to reiterate that request again today. Significant progress was made in the proposed voluntary voting systems guidelines in addressing several important security concerns including the use of wireless technology in the voting environment and guidelines for voter verified paper audit trails. However, additional work in the area of voting systems security must be address and I support efforts by NIST to develop a comprehensive security testing strategy including the development of Cyber security test methods and conformance test suites, voting systems threat analysis, further development of methods for independent dual verification and better procedures for commercial, off the shelf software testing. Likewise I strongly urge that NIST continue its work in developing the national software reference library as a valuable tool for election administrators in ensuring the integrity of voting system software.

2. Human Factors and Privacy. As you know, the proposed VVSG contains significant enhancements regarding human factors and privacy and the EAC has been well served by the important work done in this area. I support efforts
by NIST for the developed guidelines pertaining to usability
and accessibility including efforts to establish performance
benchmarks from the user’s perspective and the development
of human factors test methods and test suites.

3. Time Line for Next Iteration of the VVSG.

Finally, as to the issue of when the next iteration of the
voluntary voting system guidelines should be delivered to
the EAC. I believe that as work is completed in each
respective area such as security, human factors, core
requirements, etc. that each completed module be transmitted
to the EAC. In doing so the EAC can then immediately consider
whether to commence the public comment and review period for
that particular module and ultimately can insure that any
future changes or modifications to the voluntary voting
system guidelines are accomplished with minimal disruption
to the election community.

In closing allow me to reiterate my personal commitment
to fulfilling the promise of the Help America Vote Act of
2002 to improve the process of election administration. I
am proud to work as a partner with both NIST and the TGDC
in ensuring that the American public has full confidence in
the integrity, accuracy and fairness of our electoral process.
I thank you for your selfless commitment to this important endeavor.

We certainly thank him for his comments on these important things.

With that I would like to welcome Tom Wilkey. If you would like to make some comments. Tom Wilkey is the Executive Director of the EAC.

MR. WILKEY: I know I’ll be back a little later in the program to talk about – I see Barbara and Mark going, oh, he’s not supposed to be – but I will be back a little later in the program...

(END OF AUDIOTAPE 1, SIDE A)

* * * *

(START OF AUDIOTAPE 1, SIDE B)

...the work that Kenasaw (sic) is doing with our comments and also a little update on what we’re doing with our certification program. I would be remiss if I did not joint the chorus of those of us from the EAC I welcoming you, Dr. Jeffrey. Congratulations on both your appointment as Director of NIST and as Chair of the TGDC. We certainly look forward to working with you. Of course, my good friend, John - Secretary John Gale of Nebraska, I know you are going to
do a marvelous job on this committee just as you do a marvelous 
job for the State of Nebraska.

This morning when I was getting ready to come over here
I happen to think that twenty years ago almost this month,
Brian Hancock will remind me, we sat in a room at the Federal
Election Commission, about thirty of us, to begin the drafting
of the 1990 voting systems standards. It was a five year
process. So I know first hand the kind of work that you have
been called upon to do and I salute you for that work. I
congratulate you for that work. I know it has been a difficult
process particularly given the time frame of that nine months
of good solid hard work. I am in awe of what it took for
years for us to do and the work that you were able to accomplish
in nine months. Of course, we didn’t have NIST and we didn’t
certainly have the level of fund that, thank God, that we
have. I think that’s very important to recognize.

I want to echo also the comments made by my commissioners
and of myself that we are very pleased with the kind of working
relationship that we have with the staff at NIST, Mark and
Barbara and Alan and all of the others. You have formed a
good partnership and I am sure that whatever little bumps
in the road we find or any other questions that may arise,
we certainly, at the staff level, have formed the kind of relationship that we are going to be able to work it out. I do believe and echo Commissioner Martinez’s comments and other that we are hopeful that we can find a way to streamline this process. We’ve often said that this is a living, breathing document. Its going to go on for a long time and we need to be able to work out a process where we, when a module is done or when an iteration is done, that we get it out the door so that we are not, as Commissioner Davidson pointed out, asking our respective advisory boards to look at a huge document. That takes up a lot of time and I think that there are certainly ways that we can work toward streamlining that process for the good of everyone. So, I look forward to being back with you in a few minutes to go over a couple of other things. I do, again, congratulate you for the work and tell you personally what a privilege it is to work with all of you. Thank you.

DR. JEFFREY: (undecipherable) if you would like to say a few words.

FEMALE SPEAKER 5: Dr. Jeffrey I would like to defer (undecipherable).

DR. JEFFREY: Okay. Thank you very much. At this
time I would like to call on Mark Skall of NIST to review
NIST summary of activities since April of 2005, a report on
the related voting research recommendation efforts and update
the committee on the upcoming NIST threat analysis for voting
systems workshop.

MR. SKALL: Thank you Dr. Jeffrey. Is this on? I would
like to echo the comments that the Commissioners and Mr.
Wilkey made. I often speak about standards and testing and
describe the relationship among standards, testing and
implementation as a three legged stool. You need a standard,
you need an implementation of the standards, and you need
tests. If any leg of that stool fails the stool keels over
and I think there’s a similar parallel in the relationship
among the EAC, NIST and the TDGC. I think all three parties
are partners. They are a second three legged stool and they
are clearly all necessary to complete what we have to do.
I am proud of the relationship where we can really speak
honestly with each other and move on.

So, now I would like to speak about the summary of events
since the last TGDC meeting. When we were last gathered
together on April 20 and 21, we had delivered at NIST the
work project to the TGDC. At that meeting NIST was directed
to make final edits and deliver the final VVSG to the EAC. We made the changes according to the resolutions. We also reformatted the document. A tremendous amount of thanks to Whitney Quesenberry who helped us. In her real life she’s a usability professional. She was very valuable to us in making the document more usable. So we did reformat the document and made it more readable and delivered the version to the EAC on May 9, within the nine month statutory requirements of HAVA.

Since that time we at NIST and some members of the TGDC have been fairly active in working with various communities that were reviewing the document. There was an advisory board meeting that we sent John Cogeni (sic), who is our esteemed contractor, ex-NIST employee, to attend to help answer questions and clarify issues. The standards board meeting in Denver that many of us participated in. I made a brief presentation at that meeting to the executive board and to the plenary, just sort of an overall, high level summary of what we have accomplished to date. There were then detailed briefings made to three various subgroups of that meeting, human factors and privacy where Sharon Wiskowski (sic) and Whitney presented the work we had been doing, security and
transparency, Ron Rivest and John Waft (sic) made the
presentations there, and core requirements and testing, David
Flater (sic) and Dan Schutzer. These presentations were
actually made parallel sessions, repeated three different
times so the standards board was broken up into three chunks.
We got some tremendous insight, I think, from the standards
board and I really appreciated the opportunity to meet with
the secretaries. I think they bring a tremendous insight
that we really need. In fact, we have talked about how to
include the secretaries to a greater degree, perhaps inviting
them out to NIST to get their feedback on the next iteration
much earlier in the process. Perhaps piggyback with a meeting
they are having, so we really would like to do that and utilize
the skills and insight the have.

Later on in the summer we made some presentations at
the NAST conference, the Election Center, and an asset
conference. The audiences were primarily election directors,
secretaries of state and local officials. Again, we received
invaluable feedback, especially on the VPAT issue.

We have also been conducting other outreach. I mentioned
before we would like to include the secretaries to a greater
degree in this next iteration. Some of the commissioners
spoke about including the test lab. I believe we need to bring them early on in the process, get their comments on what we are doing as well as the vendors. I think those are three valuable sets of insight that we need to use.

To be frank in the first iteration we were really constrained by time and didn’t really have enough time to do some of the outreach we would have liked to do. We really feel we absolutely need to do that in this next iteration.

Some of the other areas where we are doing outreach. There was an NSF grant to Johns Hopkins University that many of you, I’m sure, have heard about for improving the reliability and trustworthiness of voting technology. Although that’s not a standards oriented effort, much of the research they are doing we believe overlaps what we are doing especially on IDV entrusted models so we have gotten in touch with them and we plan on establishing a strongly liaison with them.

We are going to actually participate in that kick off meeting as well.

The State of Maryland is undergoing an independent verification study where we are liaising with them. They are looking at add on technology to existing Diebold DREs, looking at providing a second verified record so, again, very
pertinent to the work that we are doing.

We are having a threat analysis workshop at NIST. We believe this is a really key event. We are writing requirements, security requirements and others, right now we are talking about security requirements for a guideline and it’s very difficult to write requirements unless you know what the problem is. In fact, I would say it’s impossible. This is really a way to further elucidate and enumerate the exact types of threats that a community perceives. We want to get everyone together. We’ve invited the public to try to document the types of threats that are out there. Look at possible remedies to the threats and try to assign at least some vague probability that these threats will actually occur, which we feel is also very important. The remedies may be time consuming. They may be very expensive. So, we really need to get a handle on not only the types of threats but the probabilities.

There is also a GAO report that’s coming out soon. The GAO is releasing a report on voting system technologies. They interviewed by NIST and the EAC and that will be coming out, I believe, in the next few weeks.

Just a few words now about why we are really year - to
talk about the next iteration of these guidelines. July 8 we met with the EAC staff to actually have a kickoff meeting with them and TGDC subgroup chairs were present as well, Ron, Whitney and Dan. We just wanted to make sure we were all on the same page. Again, the three legged stool. We wanted to all work together. We agreed, first of all this may seem obvious, but we were all in tremendous agreement that, even though we had delivered the first iteration, there was a lot more work to be done and we needed to progress and move on to the next iteration of the guidelines. We also decided that the two year window that’s in the EAC version, I guess Tom will talk about some of the changes that the EAC made to the TGDC version. One of the changes was a twenty-four month window before the standards would be effective. I guess that’s not yet set in concrete. They have to go through the public comment phase. We wanted to find a way to make sure that the work we do is incorporated into whatever standard we produce so the community could use it as soon as possible and we came upon this philosophy of providing sort of candidate chunks, we call them, to swap into the existing standard. Just one caveat, this sounds great and we would like to do it and we will do it, but we have to be careful
that we put things in that aren’t going to break other parts of the standard. When you make changes to a standard you have to be sure you are consistent. We have to look very carefully but we do believe we can swap modules in such as VVPAT and IDV and human factors work. That is our plan.

Again, the tentative agreement was to use July 7, 2007 as our final date. I know there is some concern with that date and we can certainly look at that but that was our initial thought.

The subject of internet voting came up. I know the EAC has some responsibilities dictated by HAVA on that and we felt that could be handled best by bringing that up at this meeting, seeing what the TGDC role might be in that, if any, and letting the TGDC provide some comments on the internet voting issue as well.

We have developed and submitted to the TGDC an outline for the next iteration of the VVSG and a time line.

So, that’s basically been our summer vacation and I would like to entertain any questions.

MALE SPEAKER 8: I have a question. Could you clarify how the chunks and July 2007 tie together?

MR. SKALL: Yeah. The July 2007 date is the final date
when the next iteration will be complete. The chunks are
an attempt to affect the existing VVSG that will be in place
prior to 2007 and updated when we have done our research and
completed our requirements. So we will swap, when feasible,
into the existing VVSG these chunks. They will then be
incorporated with other new material into the final next
iteration in 2007.

Are there any other questions?

MALE SPEAKER 9: Yes. Mark, I think we’ve got two
diametrically opposed ideas on the table here. One of them
seems to be bringing out some major new work product by July
2007. The other idea is basically rolling out revisions to
the existing product in a reasonable time as those ideas are
vetted out and mature and I’m kind of disturbed by the
continuing reference to 2007. I think we need to be looking
at a process where almost immediately we could publish perhaps
revisions to the last work product dealing with what we
actually know now about security, about usability, about
accessibility and continue, as we go through time, to bring
out revisions to those areas as we develop new knowledge.
I’m just afraid that if we put this 2007 date out there,
it’s going to be another one of those where we are going to
gather up all the horses and chariots and race to that date and everybody is going to sit back and say, hey the work is done. We made our deadline and totally miss the point that Tom Wilkey made which is this has to be a living work product.

MR. SKALL: Yeah, let me just, and I would certainly like to hear from the TGDC especially some of the people who have had some experience with standards. We’ve worked with a lot of standards committees over the years and there are conflicting goals here. You do want to update and include new information. Of course, when you have a standard that continually changes you have a moving target and it’s very difficult to get implementation, to get tasks, when the standard keeps changing. So, there’s really a trade off, I think, between how often one can update the standard. That’s why most standards committees have a multiple year cycle before they do updates. Yes, in a perfect world it would be great to get new information out there but the stability of the standard is certainly an issue as well. So, I would like to hear from some other people who have had experience with those issues.

MALE SPEAKER 10: At this time I will make a couple of comments. I think as we consider this work there is a
couple of items we want to think through and one is, well, certainly we will want to get new material out. We also don’t want to create too much churn in the system. Ultimately it’s what happens with what’s delivered and used in the field is of utmost concern. We want to make sure that test labs in the certification process has time to take in new requirements and that we have a time to get the feedback to make sure that the intent is actually being realized in practice. For those kinds of reasons typically I think these processes are managed in phases so that you have the opportunity to take in feedback and make sure that the last thing that you did is actually delivering the intended benefit and then as you introduce new materials, you allow the whole system to digest how that set of requirements are tested and how equipment is designed to them and all of those kinds of nuances.

MALE SPEAKER 10: If I may again, Mark.

MR. SKALL: You could also ask for members to identify themselves, again, for the Webcast.

MR. CRAFT: Okay. This is Paul Craft. The real world of what’s going to happen is as we roll out the current edition of the standards and as the labs and the users of the systems try to apply them is we are very quickly as we certify the
standards are going to find pieces as you are well aware that are not measurable, that have no basis for test. Pieces we are going to discover that are clearly in error and there will be a panic call from the test lab that’s encountered it and either this committee or some other committee seated by the EAC is going to have to meet with those labs, make decisions on the issues and make recommendations for upgrades to the standards reflecting those decisions. I think designing that process and implementing that needs to take precedence over, once again, some date in the future for a major module to roll out.

MR. SKALL: Yeah. I would agree. I think we are talking about two separate things here. We are talking about updating a standard based on errors and there needs to be a process. We are very much involved in many areas in developing test suites. Test suites very often find errors in the standard because you have to interpret the words. You find errors usually in good standards organizations always a feedback process to do that update and to officially correct the errors and put it out. That’s something that I agree with you one hundred percent has to be done.

The second issue is providing new functionality which
is really a different issue because it sets a different yardstick for the implementers. They both have to be done and they are both treated a little bit differently as far as how you phase them in.

MALE SPEAKER 11: Mr. Chairman. Thank you. Thank you Mark and Paul. I think this discussion is beginning to lead us to where this group might anticipate us unfolding. I would like to make a kind of global statement and get us back to the action, Mr. Chairman.

Starting with the Commissioners’ comments that we are creating things that have never been done before in the area of elections. So, the path doesn’t have a whole lot of road signs on it. At the same time with standards and in my experience with the access board it does take a long time in our public system of creating standards and rules and guidelines that are then enforceable. We have at the close of business tomorrow and for ‘06 are really our first attempt down this road of National Standards for the voting systems. As Paul mentioned, there will be need for clarity, for modification and so forth for this first round as we move forward. The access board between 1992 and 2004 had what you might call, some supplementary clarity items along the
way. So, using an 07 date for perhaps the second formal
iteration of National Guidelines could be an appropriate
target perhaps. In the meantime creating a methodology or
process that allows us to learn from 06 and to learn from
07 kind of state issues to incorporate them into future 08
and 10 National elections I think would be very prudent for
this group to be able to respond to what we’ve learned from
our election officials and from, you know, the citizen who
is actually participating in the voting process. Thank you
Mr. Chairman.

MS. QUESENBERRY: I guess I would like to agree with
my colleague, J.R. Harding. I think one of the things that
we deferred in the first round was being able to create a
restructured document that would be more readable, more
usable by all the parties who need to use it and I think its
important that we be able to start that work and move it
forward. That’s not going to happen in the scope of a nine
month crash to the deadline process. At the same time I agree
with everybody who said that we are going to learn things
that need to be fixed. I know that in the human factors and
privacy arena the work that’s ongoing at NIST right now that
we hope will produce either additional requirements or
clarification of requirements by being able to, for instance, publish the performance benchmarks, being able to add test protocols to the test suite. I know that the whole issue of accessibility and voter verified paper audit trails is a hot one and one that we were able to touch the surface on but we are not able to go deeply into. There are issues of personal assistive technology where there are simply technical issues in thinking about how assistive technology might connect to voting systems that we weren’t able to address and all of those are fairly small tight modules that could be fitted into the current draft and then incorporated into the restructured draft in 07. So, I do think it’s important that we not put off starting the restructuring work because it will simply never happen if we do. Thank you.

DR. JEFFREY: Any other comments or questions?

MR. BERGER: I would just like to highlight one item that I think is important especially at this juncture in our contemplations. That is, the standard, while it’s a vital tool, is not the only tool at our disposal. Certainly speaking in terms of all who were involved in the election system. We have communications, we have training, we have the testing suites and there’s a lot of components to this and I think
one of the things we want to consider carefully as we move forward is where do we get the best effect. It may well be that we are finding the standard further on some point is not the most effective way to gain a goal. Training may be more effective, better communication may be more effective, more efficient testing may be a better tool. So, I would just encourage us to consider that we have a tool box in front of us, certainly on this committee where we are most concerned with the standard but that’s not the only vehicle.

DR. JEFFREY: Any other comments or questions? Okay. Thank you very much Mark. I would like Mr. Tom Wilkey to bounce back on back up here.

MALE SPEAKER 12: Mr. Chairman, prior to Tom going into that perhaps at the end of this business you could direct our subcommittee chairmen to think about patches or fixed works for this existing area to help guide us in our labors.

DR. JEFFREY: Thank you very much. That’s an excellent suggestion. Do you have a specific motion on that?

MALE SPEAKER 13: Well, yes. I would move that at the end of today’s business that committee chairmen for the TDGC report to the chairman of the TGDC of an action plan for fixes and so forth that we find deficiencies in our current
work product.

MALE SPEAKER 14: Second.

DR. JEFFREY: It’s motioned and seconded. Any discussion? Okay. With that Phil would you like to do a vote?

MR. GREENE: This is a roll call vote on the motion that was just presented. Williams. Williams not responding. Berger.

MR. BERGER: For.


MR. CRAFT: Yes.

MR. GREENE: Craft votes yes. Gale.

MR. GALE: Yes.


MR. GANNON: Yes.

MR. GREENE: Gannon votes yes. Harding.

MR. HARDING: Yes.

MR. GREENE: Harding votes yes. Miller. Miller is not responding. Purcell. Purcell is not responding. Quesenberry.
MS. QUESENBERRY: Yes.

MR. GREENE: Quesenberry votes yes. Rivest.

MR. RIVEST: Yes.


MS. TURNER BUIE: Yes.


DR. JEFFREY: Yes.

MR. GREENE: Jeffrey votes yes.

FEMALE SPEAKER 6: We’re not getting anyone on the telephone.

DR. JEFFREY: Alan, can we get an update on.

MR. EUSTIS: I’ve got an update. For those TGDC members that are participating via the teleconference during the break we will be fixing the technical difficulties. We apologize for that but when we reconvene here at 11:00 hopefully, knock on wood; everything will be repaired and fixed.

MS. QUESENBERRY: Is it possible to record their votes if they are listening or are they simply not able to hear us at all.

MR. EUSTIS: Thank I don’t know.
MR. GREENE: We had nine votes voting for. I want to clarify something I said earlier. There are fifteen members of the TGDC. We would need a quorum of eight in order to proceed with the meeting. For each vote we would need a majority of those voting which we have had. I don’t mean to say we don’t need them. We do need their participation but if we have a majority without them, we can proceed with the resolution.

In this case we had nine votes yes, zero voting no and six not taking part.

DR. JEFFREY: Thank you very much. So, the motion carries. Mr. Wilkey I apologize for that brief interruption.

MR. WILKEY: Not a problem. I want to just make a fast comment on the discussion that just ensured. I think during my previous comments we tried to set a tone that our working relationship with the NIST staff is such that, as Mark iterated, by putting these pieces out as they are completed I think it serves the community better by getting some of these things out into the market place and I think that’s a decision that the EAC will have to make in consultation with NIST as we move along.

Certainly as we get into our certification process at
the beginning of the year part of that process will be an appeals process where we will be continually working with NIST in the areas of things that come up through testing and evaluation. What did this piece of the guideline mean and so this is going to be an ongoing process. Certainly we don’t want to take away from the fact that there will be in July 2007 a reformatted version, not at all. We look forward to that. We also feel that anything we can get out into the market place, if you will, both for our vendors, our ITAs, the election community at large, we would be very well served to do that.

Now, to the other two matters that I wanted to discuss with you this morning. One is in the area of our comments process. As Commission DeGregorio mentioned, tomorrow at the close of business is the close of our ninety day comment period on the guidelines. We were very fortunate to be able to obtain the services of Kennesaw State University in Georgia. Meryl King, as chairman there in taking over the whole process of collecting these comments, putting them up on our web site, developing a protocol and a whole structure and I have before me and you have copies. I will make sure that Alan has an electronic copy so he can put it up on the web
site with the other documents from this meeting. While I
always hate to read directly from a document, I don’t want
to take away from Meryl’s words. He did an excellent job
of putting this report together that he delivered to the
commission, this past week. I don’t want to lose anything
and so I will go and take some of the words directly from
this document.

Their process included comments are posted directly to
the web site, www.eac.gov by the author or were submitted
by e-mail. Comments were also delivered by fax and also by
regular mail. They were posted on the EAC web site by Kennesaw
staff immediately. This requires KSU staff to analyze the
e-mail contents and post the comments to the appropriate
section of the web site. Hard copy documents were processed
in similar fashion to the e-mails. By placing all comments
on line regardless of their form of submission, the public
was able to confirm their comments had been received and
posted and that review comments about the VVSG as well as
comments about any other comment in the document. Each
comment regardless of how it was received and/or posted is
assigned a tracking number within the comments system. This
tracking system enables us to account for every comment
received and its eventual resolution.

In addition, there is a twice daily back up of the online system, hard copies of all comments are made and kept on file within the Kennesaw facility. After a comment is uploaded to the web site it is reviewed and assigned the status of accepted or rejected. As of September 22, 432 comments have been uploaded and posted to the web site. Of these, 406 have been accepted for display and 26 have been rejected.

A breakdown is included in this report. As you can see comments rejected as test comments are those entered by the staff of the EAC and Kennesaw to test a feature of the system as it was being prototyped. Rather than delete these comments we elected to retain them so that we would have a complete accounting of all the comments entered into the system. Of the 11 comments rejected in the general category, it did not address the voting system guidelines or the voting technology. They were simply comments made to the voting system process and not to the guidelines themselves. They tended to be broadly focused statements regarding election outcomes and were not directed to the document as such.

Multiple submissions were those in which the author
submitted the same comment twice. All comments are retained within the data base but only those that are accepted are displayed to the on line reviewer. Of the 432 comments accepted not all are discrete, single topic submissions nor are they all posted by their authors in the appropriate category. Occasionally the author will bundle several comments into a single submission. This complex comment may address multiple sections of the VVSG. The position of these complex comments result in the total number of comments to be analyzed greater than the total number submitted. To this end we have 442 discrete accepted comments to be analyzed and processed, 468 total comments, 26 rejected, leaves 442.

On page two they show a table of the comments to date categorized for the various sections of the VVSG. It shows that the section receiving the most comments is Volume 1, Section 6 - Security. Of these 82 are related to Section 6.8 requirements for voter verified paper audit trail which is optional. Many of these redundant.

The majority of comments related to Volume 1, Appendix 8, the Glossary and are from reviewers who are on the staff at KSU. EAC has requested Kennesaw to further develop the glossary by ensuring that all key terms in the body of the
document are included. In addition we have been asked to identify and document terms where definitions vary by jurisdiction. For example, absentee voting, and to ensure that all definitions are in conformance with HAVA and other authoritative sources. Posting these proposed changes in the form of comments allows the public to review and comment on them.

To support the efficient resolution and disposition of the comments we have proposed a broad classification scheme that identifies a comment as “non-extensive” or “extensive” and as you see the “non-extensive” comments including spelling and typographical errors, formatting errors, pagination, conforming glossary definitions to authoritative sources and affirming the currency and correctness of references.

There are the “extensive” comments which are those that will require more thorough research and may extend in the areas of law and policy. For example, changes from should to shall or shall to should, alteration of scope or the subject under consideration, technical specifications, changes in performance of a component of a voting system. Resolving these comments will require some research and perhaps multiple
passes through different reviewers. To control the process of resolving and incorporating comments into the final version of the VVSG, Kennesaw has developed an on line system to enable designated reviewers access to the comments as well as recommendations for resolution. The EAC staff will determine who the reviewers will be. Our prototype assumes and certainly will be Kennesaw staff, NIST personnel and the staff of the EAC. Each change to the Voting System Guidelines that is a result of the processing of a comment will be tracked and including the appropriate sign offs with the final sign off being that of the EAC.

In summary Kennesaw has implemented a system that tracks every comment from its origin to its resolution. This resolution will be incorporated into the Voting System Guidelines as submitted incorporated into the guidelines after modification or unused.

Finally, we are aware that there are a number of organizations, vendors, some of the ITAs who have not yet commented. We suspect and having gone through other standards processes, I well understand that these comments will come at the eleventh hour. It will not be surprising to us if Saturday morning the number of comments will have doubled.
It will take a few days for Kennesaw to go in look at these, get them up on the web site and probably early next week you can see all of them as they are received.

I’m very pleased with what Kennesaw has done for us. I think they have done a marvelous job of producing a process whereby everything is transparent, everything can be seen. All of the comments can be reviewed. Now we will begin the laborious task of working with NIST staff and others as we come to a conclusion and hopefully get the final document out the door sometime later in the fall.

The other piece I wanted to bring you up to date on and very quickly, is where we are on the voting system qualification and certification program that the EAC is about to undertake. As you know the Help America Vote Act statutorily mandated the EAC in carrying out its duties relating to not only the voluntary voting system guidelines but carrying out the duties related to the testing, certification, decertification and re-certification of voting systems hardware and software, carrying out the duties relating to conducting studies and carrying out other activities relating the Federal elections. We look at our process two fold. First as a national program the primary
concern of the EAC is that the system designed has represented in the system submitted for testing meets the requirements of both the present 2002 voting system standards and the VVSG that will come out later this fall. When at some point we decide that goes into effect and that is still under discussion and will be discussed in the comment resolution. Others at the state and local programs the primary concern of our state and local election officials that the units delivered meet and continue to meet the requirements over their useful lifetime. We looked and we were very pleased and I’m glad to be standing next to him right now, the services of Steve Berger who has helped us not only look at developing this program but is working with us presently in developing all of the necessary procedural documents that need to be put in place, all the forms that we will be using and working with us as we move along. As some of you may not know, Steve has had significant experience working with the Federal Communications Commission and we are tailoring some of our processes off of what that Commission has done in the past. We are very grateful to have Steve working with us on this program.

As we looked at the key issues for certification, we
asked the questions what is the minimally acceptable system? Are the testing labs and the testers in the lab assessors qualified? Will the vendor deliver units within manufacturing tolerances to those tested? How will the election officials know if non-compliant units are delivered and what corrective actions can it take? Will election officials and poll workers use the system as intended? What are the processes, the technical standard establish normative standards which is, right now, the 2002 Voting System Standards, and what will come out as the final VVSB by the EAC? We find and keep the standard current and that is exactly what we were talking about in our earlier discussion. As a living, breathing document, as a document that will be utilized by our test laboratories. It will be needed to, there will be all kinds of additions made as we move along. As we went through our (undecipherable) program over the years and I look at Paul who worked with me closely on that, we know that every time we turned around we saw a piece of the standard and said, now, how did that get there and what does it mean? And we know that no matter how well a document is proposed and accepted and finally adopted, there will always be opportunities for looking at a piece of a standard
or guideline and say, now, what exactly did they mean by that and making some necessary changes or corrections to rectify it.

Certainly we are working closely with NIST and the NAB lab to the accreditation of laboratories. We have already begun the process of an application process for ITAs and expect to submit to the EAC for accreditation a list of laboratories to be accredited sometime in mid-07. In the meantime, they have grand-fathered the three ITAs that are currently accredited by NACET and as we do our work we are in the process of doing two things. One, taking a look at the present NACET accredited labs, having them reapply, updating their information from when they originally applied to NACET in terms of staff, resources, and other information. We are looking at using a process of utilizing technical reviewers who will review and give recommendations to the EAC. The reviewers will be experts under contract to the EAC. The reviewers will have specialized qualifications in various topics. For example, security and engineering and so on. EAC will perform routine performance evaluations of these reviewers. In terms of the product evaluation, it will be our responsibility to review the test plan, testing and
test reports. Witnessing the testing is part of the process and reviewing the test reports and putting the test reports up on our web site for everyone to see. Certainly the process will include interpretations, petitions, appeals and complaints and we are working now to develop all of the procedures in that particular area. We are also looking at the processes for getting clarification, initiating change and redressing grievances. We are in the process right now, as I said earlier, of going through the vendor registration of the three and will be working in that area during the month of October and we hope to have that process up and running by January of 2006 and I will assure the members of the TDGC that as our procedures become available and adopted by the Commission, that they will be transmitted to you for your review and evaluation. Thank you.

MALE SPEAKER 15: I have a comment about the comment resolution period. I didn’t hear the TDGC mentioned as in the loop for reviewing comments or changes proposed on the basis of those comments. I was wondering if there was something foreseen for us in that regard?

MR. WILKEY: Well, I think certainly there will be occasions when we will run into comments that involve, for
example, the shoulds or the shalls, or some of the
determinations that were made by the TDGC in recommending
those issues to us. We will be working with NIST staff.
We will also be looking at the record of your discussions
to take a look at how those discussions were developed, what
come out of them, how the decisions were made. Certainly,
if need be, we will be reaching out to the chairs of the
subcommittees to get, perhaps, their view of what happened
during that discussions. So, I see it as very broad based
and certainly for the most part I think we intend to work
very closely with the NIST staff and looking at the record
as it evolved from your committee in making these decisions.

MS. QUESENBERRY: Just a procedural question. I’ve
been through a couple of industry standards committees and
in those there is always a process of taking all of the
comments and addressing...

(END OF AUDIOTAPE 1, SIDE B)

* * * * *

(START OF AUDIOTAPE 2, SIDE A)

MR. WILKEY: then find a way to post that information,
get that information so that its available to everyone.

DR. JEFFREY: Any other questions. Thank you very
much. We are a few minutes ahead of schedule and what I would like to do is stay on the agenda and actually expand the break so that we reconvene at 11:00. That will also give us a few extra minutes to fix the audio-technical difficulties. Let’s meet back here at 11:00 a.m. Thank you very much.

BREAK

DR. JEFFREY: Good morning everyone. If we could take our seats. Just a quick note. We are doing, if you will, a planned “C” workaround this morning. We can work on plan “A” and plan “B”.

MALE SPEAKER 16: Okay. If everyone will take their seats. We have in this session at the end of the presentation by Ms. Guttman and Mr. Wack, a scheduled vote. I have called the participants on the teleconference, the TGDC members and they have so agreed that at the time of the vote I will then call back in on my cell phone. They are watching the Webcast and they will then provide the vote directly from the cell phone to Mr. Greene and that’s how we will record their vote. After lunch we will work on the amplifier issues and see if we can come up with a better solution. At this point they are able to hear and see us through the Webcast and the closed captioning is working as well. So, with that, Mr. Chairman,
I hand it back to you.

DR. JEFFREY: Okay. Phil, are you going to do another roll call vote so they may be able to respond to the roll call.

Okay. First of all for those TDGC members who have experienced the audio difficulty I would like to personally apologize as Director of NIST for this technical difficulty. Hopefully, the afternoon from here on out will run a little bit smoother so that you can hear and participate in these proceedings. With that, Phil.

MR. GREENE: I will proceed with the 11:00 roll call. Williams. Do we know if he is not participating at all?

Okay. Berger.

MR. BERGER: Present.


MR. CRAFT: Here.

MR. GREENE: Mr. Craft is here. Gale.

MR. GALE: Gale is here. Elekes. Elekes was with us earlier and we are going to try to work around to confirm his presence. Let me proceed with Gannon.

MR. GANNON: Here.
MR. GREENE: Gannon is here. Harding.

MR. HARDING: Harding is here. Miller. Elekes is here. Miller. I’ll come back to that. Purcell.

MS. PURCELL: Purcell is here. Quesenberry.

MS. QUESENBERRY: Here.

MR. GREENE: Quesenberry is here. Rivest.

MR. RIVEST: Rivest is here. Schutzer, I believe is not participating today. Turner Buie

MS. TURNER BUIE: Here.

MR. GREENE: Turner Buie is here. Jeffrey.

DR. JEFFREY: Here.

MR. GREENE: Jeffrey is here. Trying again for Miller. At the moment not responding. Currently we have eleven members participating.

DR. JEFFREY: Thank you very much. At this time I would like to call Mr. John Wack and Ms. Barbara Guttman of NIST to present the preliminary report on the outline and time line strategy which I’m sure will invoke a significant amount of discussion.

MR. WACK: I just want to make sure we’re on. Okay. Thank you very much. It’s always a real pleasure to be able to address you. I want to welcome Secretary Gale first.
We’ve got kind of a two part presentation and we just have half an hour so I’ll do my best to be fairly brief.

Basically I will talk about pretty much an overview of the ultimate standard that we proposed to you that we would like to write and then Barbara Guttman will come in after me and talk more about, I guess, for lack of a better phrase, the chunking strategy that we have come up with. It sounds like a candy bar but --. The other thing I wanted to say is being from the great state of West Virginia and listening to John Denver’s *Country Roads Take Me Home* about three trillion times, its nice actually to be in his home state where they probably *Rocky Mountain High* at least that many times.

So, let’s get right in. These are the topics we are going to be talking about. I’ll do the first two and talk about the major organization. Barbara will focus more on the time line.

The major changes. We’re talking about major changes to the VVSG currently out there on the EAC site as well as the previous versions of the VSS. I’ll just go into this briefly. I think that we recognize in looking at all this that for voting systems to be usable, accessible, reliable,
have security, that the standard itself has in itself to be very usable. It has to have good requirements but it just has to be very well organized. The requirements have to be directly testable as much as possible. Voting system test labs, vendors, election officials, need to be able to read it. It has to be written in such a way that it can incorporate changes and be modified. In other words, that’s what we’re proposing here. We are proposing a more usable design to the standard. It will have significantly expanded requirements in the core requirements area, accessibility, usability, security. Getting into it a little bit we are going to talk about the new requirements format.

Currently we did some changes with the EAC’s VVSG in the requirements format and we will continue along those lines. Requirements will be numbered as they are numbered right now. You will notice that in the EAC VDSG that requirements nesting can get very deep so we’ve actually been working with some contractors outside of NIST to somehow or other still do the proper nesting in requirements levels that we need to do but at the same time make it easy to find, make it easy to use. I’ve got a couple of fields here, test reference is basically a field that will point to a corresponding
general test method test case that can be used for that requirement. In other words, a test lab can look at a requirement and actually find the associated test page associated with that. If there are any associate procedures that go hand in hand with the requirement, then another field for that, a discussion field basically to provide any further discussion, references, clarification things like that. Then we have kind of a hidden field. We don’t plan for this field to be in the ultimate standard but during the development of it we want to have an impact or a justification statement, what impact will that requirement have. I have to apologize that in the document that went out to you that went along with this that field was called “I” and for some reason I changed it to “J”. I guess because John begins with a “J” but into the overall organization now, I want to talk about we have five basic documents and whether these will all be one big document or five separate documents we haven’t really cast that into concrete at this point.

Essentially in overview and I’ll provide a slide for each of the following: the overview essentially is an overview, how the standard is to be used, how it will be organized, a roadmap to the other sections, overview of material, any
discussion of concepts that may be required, IDV and things of that sort. When I talk about the product standard and standards of data to be provided requirements, those two have the vast majority of requirements there and they will be pointing to the fifth one which is the testing standard.

Start with the terminology standard. Perhaps one of the very most important parts of this document is just basically agreeing on terminology and what we’re doing is we’re going to continue with the glossary work we already have underway and combine that as best we can with current usage of election terms. Just one thing that came up during the standards board meeting was that in the VD path section I had a requirement that basically spoiled electronic records and paper records should be preserved and that cause a lot of confusion and it finally hit me that my use of spoiled in an electronic record was very confusing. How can you actually spoil an electronic record? So, it kind of it me that the terminology standard is something that will be very important.

The products standard. This is a fairly lengthy set of requirements and set of sections. In essence I would say that there are many general requirements in this section
associated with security, human factors and privacy and core
requirements and then there will be other sections in there
that will be more organized along the lines of voting activity
or voting function, pre-voting, casting count, reporting.
I also have a section on independent dual verification.
So this is what I’m talking about here. I’m, actually, if
you are looking along, its slide 17. The reference model
section is really an informative section at that point talking
about the process model for voting activity and logic. The
role model there is really the role model access control model
that we will be using to basically designate access to voting
systems.

Standards on data to be provided. They are to be provided
by vendors and voting system test labs. In essence, basically
documentation, reports, public information package,
information that has to be provided to the National Software
Reference Library, fairly self-explanatory there.

The last of the major sections which is the testing
standard and basically that will have an introduction to the
test methods that we’ll be describing. General test methods,
testing protocols, test cases and not currently in the time
line of VDSG modules, I want to soft pedal that a little bit,
we are going to be starting from scratch, really, in terms of security and to a certain extent usability and accessibility so we don anticipate that we will have all the specific test cases that depend on research to be done at that point. I think, though, that by our projected date of July 2007 we are talking about a testing standard that will still have a fair amount of material fleshed out at that point.

I have tried to go fairly quickly and when other people such as Dave Flater or Nelson Hastings or Sharon get up and talk about their material they will, of course, talk more about these sections at that point. So, if its okay with you, what I would like to do is ask Barbara to come up and talk about the chunking strategy and then maybe if you have questions we can both answer. Thank you.

MS. GUTTMAN: First I have to thank Paul DeGregorio for giving at least fifty percent of my presentation for me. Thank you, Paul. Mark covered about thirty percent, somewhat overlapping. I won’t have a lot of new material for you. Mark talked about the meeting we had this summer with the TGDC subgroup chairs to talk about how do we get where we need to go. A lot of people have raised some of the
important issues. There is a lot to do, the need is out there, how do we address short term, long term.

We developed a strategy. This strategy we are presenting to you the TGDC, this needs to be your strategy. This is a proposal to you that you need to adopt, modify or reject. I wanted to make that clear, this is, the document that will be delivered in July 2007 if you decide on that date, is a document you are delivered. It will come from the TGDC.

So, let me tell you a little bit about it. The first issue was, well, there’s a lot of work to be done. You have heard this problem. There’s a lot of work to be done but once we get something down if it stands alone, the EAC said can’t you deliver it to us early? We thought, well, maybe we could. Maybe we could for some of the sections especially when the usability performance benchmarks are done. They kind of stand alone and that could be delivered. Some of the IDE material also can stand alone. There may be some others. There is some material that can’t stand alone, that if you change one part, you have to change a zillion other things somewhere else in the standard and they will have to wait until the restructured version comes out. If we can, as we develop our work product, if we see that something can
stand by itself would you all feel okay with delivering it. Are you okay with picking a date of July 2007 and are you okay with delivering modules early? I see nodding.

Keep in mind the things we are voting on, July 2007 and modules as determined by the subcommittees and the TGDC.

I wanted to talk a little bit about how we would do this work. You know having two years is way better than having nine months. Its still not an endlessly long period of time. Its still a very ambitious schedule for the amount of resolutions you all passed in January, quite frankly. So, what we thought we would do is work kind of the way we have been working now. A lot of activity would happen with the subcommittee. They would work and develop chapters, vet them within the subcommittees and send them to the TGDC and every one and then we would have TGDC meetings where we would do the formal, making sure we are on track. There should be no surprises. The subcommittees should have done their work and we have e-mail and the web site to actually have discussion happen so that we don’t have to wait for meetings to move things along because it makes it kind of happen slowly. We want to move quickly.

The general work plan, part of this answers perhaps a
question that Paul asked, which is, or maybe it was Ray Martinez, well, can’t you give it to us in 2006? Well, you know what, there’s a lot of work to be done and there’s a lot of work that’s original research. I think this was something that J.R. mentioned too. Some of this work has just never been done before. Its supplying developing technology to voting systems. There’s not the research background. So, research has to be done, especially in areas of usability, accessibility and security.

This field of IDV, I mean this is something you all invented as a term. Some other groups have been looking at it also in parallel but this is a brand new idea. This is not something that can be just written up in six months. Its going to need time to really think about the ideas, to try some things out, to do a lot of peer review with experts in the field. When you are doing research it just takes some time. Then, of course, one has to do analysis after you do your research to apply the security knowledge to voting, to apply what we have learned in accessibility and usability to voting. Then there is also a period of review and outreach was something Mark talked about that, during the initial period a lot of outreach was done but really a lot more
outreach should have been done. That’s something we need
to do a better job at in round two. We need more peer review
for this material. While I would love to tell you we could
do it tomorrow given the kind of quality work we want to give
you and I know you want good quality, that’s what I think
we will be doing for two years.

Let me talk a little bit about, you all got a time line
which I thought was just too ugly to put up on here so I have
a sort of brief synopsis of it to show you the kind of pace
that would have to be kept by these committees, your
subcommittees, if we were going to meet July 2007. I figured
that security has to have three chapters a quarter starting
in 2006. Perhaps we could get the IDV VVPAC rewritten for
April 2006 and maybe the IDV witness by October 2006. The
witness is the one that’s farthest along after VVPAC to
address. For human factors and privacy to draft performance
specs by April 2006 and to then complete the whole draft by
January 2007. CRT who you will hear a lot about the work
they have been doing when Dave Flater and Alan FLATER get
up later, I put down some of their major items. These are
items from the new outline to draft the performance material
by January 2006, workmanship, counting and casting by April
2006 and a full draft by October 2006. I put a big emphasis
on really having all of the drafts done by January 2007 to
give us time to review them. To give us to get good comments
in, to give us time to make sure that the pieces that we all
thought were working together really do work together the
way they are supposed to. There’s a lot of overlap between
these three subcommittees. They are not that discrete. We
have to make sure there is coordination. That’s why you might
think, well aren’t you done by January 2007. There’s going
to be a lot of work after that.

Items in the specific work plan. See, I tend to get
ahead of myself. Have a full draft of everything for testing
by January 2007, including the overview, the reference models
and the data to be provided. I hate it when you mistype and
it’s a real word. So, we would have all of that together.

We will be able to incorporate the comments and get a final
document by June 2007 ready for delivery to the EAC and that
would include, since Whitney’s probably thinking it that
would include a usable standard.

I’ll talk a little bit more about the testing standards
John talked about. In testing there’s a lot more work that
needs to be done in terms of developing test suites. That
will come afterwards. So, that said, I would love to have you have some discussion and make sure that these items, the final dates, the outline that John presented, the modules strategy and the general work plan strategy works well for you and, if not, we need to change it and make something that does work well for you.

FEMALE SPEAKER 7: Too far from mike to be heard.

MS. GUTTMAN: As we finish them we will deliver them.

FEMALE SPEAKER 8: Too far from mike to be heard.

MS. GUTTMAN: The full testing, except for the full testing because I’m not quite sure how that is going to progress. The testing divides into two categories. You have high level stuff which you are testing, strategy what’s your test method, and then actual test suites. In the usability I would expect we would have the full test suite by then too.

FEMALE SPEAKER 9: Too far from mike to be heard.

MS. GUTTMAN: Yes. That comment is very near and dear to Mark Skall so I’m thinking he will make sure we are there.

MALE SPEAKER 17: Too far from mike to be heard.

MALE SPEAKER 18: --- that discusses a high level strategy and has references to test cases. So, its an approach that starts at the highest level and goes down. In addition
to that you need full test suites to determine whether all
the requirements are met, to determine a full amount of
security testing as well as usability testing. Those are
really separate from the standard. Those aren’t part of the
standard test suites. We hope to be funded at NIST to do
that.

A separate issue. The testing part of the standard we
really haven’t specked out in detail because there are many
different ways you can approach it. We fully expect to have
a majority of that done, if not all, within this time frame.
Depending upon how many test suites that are pointed to
that’s why it was a little vague. So you have to understand
where we are coming from. There will be a lot of work done
on testing. I believe that by the time we issue the next
iteration, we will be able to issue a testing piece.

MR. CRAFT: My concern, Mark, is there’s a lot of prior
art that’s out there now that’s really not been published
in the current draft of the standards. The existing testing
labs and some of us in the States have been testing to the
standards for some time. We’ve got standard test suites that
we run. We’ve got approaches, a lot of which is very valid.
The areas of security, system validation, there is some work
out there that’s not been published which a lot of states
could use in the short run. Accessibility. In Florida we’ve
got, and I’m sure other states have similar rules, we’ve got
very specific functional requirements for an audio ballot.
We’ve got very specific layouts for test screen ballots and
paper ballots which are intended to make those usable. So,
there is what Whitney termed, a lot of low hanging fruit which
is good work. It obviously needs more research and it needs
to be expanded by July 2007, but I think there’s a lot of
work product there that could be added to the existing
standards in 2006 rather than waiting until July 2007 and
come out with everything then.

MS. GUTTMAN: I’m not exactly sure what your question
is. I think you just offered to help a lot with the testing
work. We accept your offer.

MR. CRAFT: Okay.

MS. GUTTMAN: Your kind offer.

MR. CRAFT: Yeah, there’s a lot of stuff out there
in testing that I think should be brought into the document
now. Its good work. There are a lot of standards for usability
and accessibility that are more specific than anything in
the current standards which ought to be added in the near
future.

MS. GUTTMAN: Absolutely and as a TGDC member, we are relying on you to help bring that forward.

MS. TURNER BUIE: At the end of the day when all the work is done obviously what this committee and everyone wants is for the election officials to be in compliance with the guidelines that, obviously, are voluntary. Today the election officials are working to meet the 2002 standards. When these are completed if its completed with a deliverable on July 2007 and the EAC adopts it in early 2008, and election officials are required or they want to be compliant for the primary and general election of 2008, that will make it extremely difficult, if not impossible for them to meet because when you consider compliance –

MS. GUTTMAN: Well, that’s an issue that Paul brought up. The EAC will consider what kind of strategy to use for implementation. Like for this round they are going with a two year implementation. They will learn some from this and may revise their strategy but they are very aware that you just can’t turn over equipment that fast. That is one reason why we have this focus on transparencies so that there won’t be any surprises in the standard when it comes out.
What the TGDC is considering will be open and of course there are several vendors in the audience. They will know what’s coming so they can start planning now how they are retooling their lines to meet election officials’ needs. Yes, the implementation strategy is a very significant issue that I know the EAC spends a lot of time on.

MR. GALE: Mr. Chairman, John Gale, Secretary of State of Nebraska. One thing that concerns me about these deadlines is that we’ve all been running to break the three minute mile over the last couple of years and particularly the EAC and NIST. Everybody, more than doing double duty, is doing triple duty because we have state changes in election law we are trying to accommodate. We have voter registration systems that we are trying to implement. We are trying to accommodate provisional balloting changes and if we have too many ongoing changes in equipment requirements such that the vendors have difficulty with the challenge. Even in Nebraska we have 12,000 virtually volunteers who have to be trained to run these elections, it seems like there’s no real good reason to make this so arbitrary that we really can’t perform on all the levels that we need to perform to make these elections work. If we over compound the difficulties just
to meet an arbitrary deadline, and to throw it into a presidential election year, it seems like we really are compounding the problems for election officials who want to have elections right. They want people to feel comfortable when they come to vote and know that their vote is going to be cast and going to be counted but at the same time, there is only so much in the budget for election officials for training. There is only so much in election official budgets for opportunity to spend time (undecipherable) all these changes and commenting on them. I think it could cause almost a deflation in the election industry because it’s a fragile enterprise. It’s not like the banking industry or the insurance industry. It’s a pretty fragile enterprise with an awful lot of volunteers and a lot of officials with very limited budgets and limited help. I’m a little concerned about the deadline unless there is something in the statutes that mandate it.

MS. GUTTMAN: The deadline is one you all can pick because we had a statutory deadline for the first iteration. There is not one for the second. You should feel free, if you want to propose a different one, you may do so.

MR. HARDING: Thank you Mr. Chairman and Barbara.
I’d like to preface my comment with the big picture. We’re changing the game and many people in the disabled community are very afraid of the reality of the budget and the reality of the election officials and are nearly three billion dollars may or may not only be a one time infusion of capital. It is the hope of the disabled community that the EAC, in their wisdom, will set this bar as high as they reasonably can go in terms of the expectations for the 06 because we may never be able to buy equipment again. We could signal to the industry that the expectations for the disability components, the testing and all the other pieces involved that we could get them as far down this road when they are buying now that this equipment can easily be modified, can easily be upgraded without any threats to security, without any threats to peoples’ dignity, without any, you know, real heartaches. Having said that, getting back to the outline that you lay before us, I have no particular heartburn with it but I think it gets back to the fact that we are changing this stuff radically but we really only have one checkbook right now. If we don’t do very well in 06 the likelihood, considering all the current national issues with rebuilding our America, our checkbook is pretty dry right now. Unless we can show
some confidence and a sense of return doing this right on this first round, we are probably not going to ever get any more money. I would like to urge us and our Commissioners to really get that bar as high as we can and that with the module work these could be natural fixes or natural clarity to get us through the little hiccups that we can guarantee to expect in the upcoming elections. On that note, I would strongly encourage all you to get us some of that low hanging fruit, some of this data that’s available to us so we can move this thing forward. I would again like to said that, a lot of us are counting on us to do this right now but we don’t have a lot of confidence necessarily or, let’s say, absolute guarantees that we figured this mousetrap out right. As we move it we need to be able to put the band aid on it without having to disrupt the whole thing for our election people. Those are my only thoughts. If you need a motion coming out of this, that this is a reasonable set of guidelines with the modules which I think we votes on earlier that the subcommittee chairs will be moving some of the little module issue forward, makes good sense. We got to go as high as we possibly can in 06. That’s my thoughts.

DR. JEFFREY: We will entertain a motion in just a
minute on that subject. I would like to see if there is some
other general discussion first and then I think there were
two issues that would require a vote. One is specifically
a motion on the modules and the second is going to be a motion
referring to the July 2007 date. So, of course, some generic
comments, and then I will move for a motion.

MR. BERGER: I would like to first say that I’m
supportive of the comments that my colleagues have just made.
I share the concerns about the relative fragility of the
system and we need to be concerned about the unintended
consequence particularly in this system. I certainly share
the concerns about inclusion of the entire population and
their ability to vote.

Let me preface, because I’m afraid I’m going to make
life a little more difficult in my comments that my goal is
that we look at our resources and we strike the best balance
delivering the most benefit we can collectively. There is
three issues I would like to bring up and see what comments
you may have now but definitely to log them in our
deliberations.

The first is do we have and will we be gathering data
on the correlation of our various specifications and tests
to the desired outcome? I’ll just say I am somewhat insecure as to exactly where the holes are and equally where things are adequately addressed to the 2002. Equipment that meets exactly the 2002 requirements, what problems are solved and what problems remain. Equally, I think that question very much is before us for the 2005 VVSG when its approved. Are we really addressing current needs or are we continuing to address needs that perhaps have adequately been addressed in previous work. That’s the first issue. Make sure that we have some feedback into our work so that we are moving consciously towards higher degrees of correlation between our specifications and testing which are always attractions to a desired end result.

The second one is an old lap hound. I’m very concerned overall about our repeatability, uniformity of evaluation. What is our information? What is our judgment that the same equipment coming into different labs will get the same evaluation or even coming into the same lab at different times? I want to make sure that we include that. It’s a difficult issue, particularly in some areas of evaluation.

The third one I would put out, and I think in your discussion of research you raised it, have we equipped
ourselves with a mechanism to raise issues that we may not have the ability yet to even write specifications or perhaps write test cases for? I think it may be important that we be able to afford ourselves the ability to say here’s an issue that we think is important. We may not have the ability to specify a solution but we want to alert the vendors that we are looking for solutions. We are looking for good thoughts on the topic and then see what comes. I think this goes to your comments on research.

DR. JEFFREY: Are there any more general comments before we go to specific issues?

MR. RIVEST: Just a quick comment. I think that the time line as proposed here looks very plausible to me and I think we need to decouple in our thoughts the issue of is this a reasonable time line for the work that’s proposed versus, you know, does this time line, how does this time line interface with the rolling out of elections and I look to the EAC commissioners for giving us guidance on the latter matter, particularly in terms of the work proposed and the amount of time allocated for doing it seems quite plausible.

MR. GANNON: I just wanted to add, as the specific work plan is being put together that attention would be drawn
to the document that was distributed back in June which was
the resolution chart of the disposition of resolutions, which
ones were put into the VDSG1 and which ones would be addressed
in VDSG2. So, as the specific work plans are being put forward
care is taken to be sure that we’ve got each of those
resolutions addressed and time is allocated in the work
schedules for those to be sure we cover those and we don’t
get lost in the specific detailed activities.

MS. QUSENBERRY: I just want to pick up on something
that Mr. Berger said which was not excluding requirements
simply because we don’t actually know how to do them yet.
One of the issues that I’ve heard come up is the way we
structure the document with a kind of high level goals
requirements and specific requirements under them. Although
I think there is some presentation issue we need to address
I think its very important that we continue to structure our
work so that we are pointing, that it just doesn’t become
a laundry list of technical requirements but does, in fact,
point toward the goal of improving elections and why these
requirements exist toward improving elections especially if
we are going to this a little bit piecemeal. We can then
say, we are placing this module because we now can address
the goals we couldn’t address in the past, for example.

DR. JEFFREY: With that what I would like to do is, there is clearly two fixed issues. One is what’s now called the chunking strategy and the second is the July 2007 work plan.

MS. QUESENBERRY: We also need to adopt the outline.

DR. JEFFREY: Yes, yes. Let me deal with the chunking strategy. The module strategy, the chunking strategy. Basically any disagreements. From the comments I tended to hear a lot of general consensus with them. Is there any disagreement with the module strategy that was put forward? Can I ask for a unanimous consent? Lets vote on unanimous consent on adopting the chunking strategy. Any disagreement? Let it be noted that by unanimous consent that that’s passed.

MS. QUESENBERRY: Can we be sure that we are including the people on the phone?

MALE SPEAKER 18: I’m on the phone now and waiting to hear their replies.

DR. JEFFREY: Okay. Now lets discuss the July 2007 issue. If I may make one comment. Based upon some of the discussion this morning by the EAC commissioners it is clear that for us to provide a product that may usefully fall into
their time line, July 2007 may not be the optimal time. I guess I would like to actually propose a motion, if I can be so bold, that we basically ask the NIST staff working with the EAC to perhaps come back to us with a proposed time that would meet the needs of the EAC commissioners working backwards to allow the states to adopt and incorporate the technologies as well as being able to have a technically viable product. Is there a second?

FEMALE SPEAKER 10: Second.

DR. JEFFREY: Is there any discussion?

MR. HARDING: When (undecipherable) perfect date for us to have completed the second rendition that we have a reporting time line back to us so that we can then work on module issues as well. I would think it would have an impact there.

DR. JEFFREY: Absolutely.

MR. HARDING: Maybe two months from now or three month that we are informed when this magical date appears.

DR. JEFFREY: Absolutely. I would like to amend so that we get a response back to the committee, to the chairs of the subcommittees within two months. I think within sixty days would be reasonable. If there is any disagreement, if
any of the EAC commissioners would like to weigh in on this. I’m essentially tasking the EAC commissioners, please add in any disagreements or consensus. Any other discussion? Is there any disagreement? Otherwise I will go for a unanimous consent.

MALE SPEAKER 19: Mr. Chairman, just a point of order. You have a motion now and you have unilaterally modified it.

DR. JEFFREY: Oh, I’m sorry. Excuse me. I’m sorry. Is there a second to the modified? Thank you, I apologize. Any discussion on the modified. Phil, could you?

Well, I was going to ask you if you could read back what we actually agreed to. The proposal, let’s see if I can reword this.

FEMALE SPEAKER 10: I said “You propose that the EAC and NIST come up with a new date within sixty days.” But there’s not much guidance given about just a new date that’s better.

DR. JEFFREY: A new date that would meet the needs of the EAC commissioners working with the goal of supporting the states as well as being something that is technically supportable by the amount of work necessary. Again, I
apologize for the ad hoc nature of this. Is there any
questions or discussions on the meaning or intent of the
proposal? Okay. With that as a proposal, let me start from
scratch. Is there a second to that proposal?

MALE SPEAKER 20: Second.

DR. JEFFREY: Okay. Any additional discussion? Then
I will call for a unanimous consent. Is there unanimous
So any problems on the phone.

MALE SPEAKER 18: No.

DR. JEFFREY: So moved. In general, given those two
proposals that have just gone forward and voted through, the
remainder of what was proposed NIST believes that their
preliminary report titled “An Outline and Timeline strategy
for the next VVSG iterations” responds to all the relevant
adopted resolutions by the committee. So, unless there are
any supplemental directions or corrections, they are going
to continue to march toward the outline that they have
proposed and so I would like to have a motion to concur with
the outline on modifications to that.

MALE SPEAKER 21: So moved.

DR. JEFFREY: So moved. Second?
MALE SPEAKER 22: Second.

DR. JEFFREY: Okay. Any discussion?

MALE SPEAKER 23: For clarity, did they put together like a check sheet of sorts of resolutions of the conclusion that the DCSG wants and how it all matched together as to why it increased the confidence in the execution of the actual voting process. Is that a fair summary?

MS. GUTTMAN: I think we are moving to just adopt the outline.

DR. JEFFREY: Could you put up the actual slide that referred to --. To make it unambiguous let's put up the actual, I think you have two slides that showed the -

MS. GUTTMAN: This one.

DR. JEFFREY: Okay. So, this is basically the outline that's been proposed.

MALE SPEAKER 24: Yes, I am in agreement with the outline. I just was pulling off of Whitney's comments as well as Pat's as the outline related back to our resolution and that we were accounting for the spirit of the globalness of voting.

MS. GUTTMAN: Okay. As a separate thing NIST will commit to sending you an updated resolution chart that shows
how its mapped in.

MALE SPEAKER 24: Correct and that we’ve accounted
for the spirit of the committee. Right. Okay. Because that
was a big issue with the advisory committee as what was the
intent and the spirit of the TDGC and how did that manifest
itself into a living, breathing document and it kind of
connects the dots.

DR. JEFFREY: So, I would like to propose two
resolutions. The first one is on the outline and the second
one is to actually have as a task to NIST to provide that.
So let me deal with the first one and then we will get to
that one. The first one is on the outline. I believe I heard
a second early on on adoption of the outline. Is there any
disagreement with the proposed outline?

MALE SPEAKER 25: I have one question.

DR. JEFFREY: Yes, sir.

MALE SPEAKER 25: Just one question on the written
material. On several places in the technical data package
you refer to ISO 9,000. I’m reading that broadly as the family
of 9,000 and the current versions of those, is that correct?

FEMALE SPEAKER 11: Excuse me, is that what I mean

Dave?
MR. FLATER: Yes.

MALE SPEAKER 25: Okay.

DR. JEFFREY: Then I am going to call for a unanimous consent on the adoption of the outline as currently shown on the screen. Is there any disagreement with the adoption of this outline? So moved. I believe there was also a motion on the floor that NIST will, how do you want to characterize this Mr. Harding? That NIST will basically go back to the matrix of both the compliance with the original resolutions for versions one and version two plus the intent of the TGDC and how that maps into the strategy?

MR. HARDING: I believe you captured it. It's just a check sheet of sorts of VVSG1 meaning the initial intent or the resolutions guiding our work product and then the inclusion of future resolutions as it relates to our outline to capture the holisticness (sic) of the voting process and the spirit of the DGDC.

DR. JEFFREY: Is there a second?

FEMALE SPEAKER 12: Second.

DR. JEFFREY: Okay. There's a motion and a second. Any discussion? Is there any disagreement with the proposal? This is such a bashful group I wasn't sure.
Then without, I’ll call for a unanimous consent. Again, without any disagreement with that, the proposal is adopted. Okay. I think you have everything that you had?

MS. GUTTMAN: That’s everything that I wanted. Thank you.

DR. JEFFREY: And more. Okay. So, with that, thank you very much. What I would like to do is do a quick one minute check. We are having, cross our fingers, hoping that we can now get the audio turned back on for our people on the Web cast. We have a lot of feedback. You have to hold your ears. We are going to shut it off and we will continue using the cell phone. So, if we could do a quick audio check.

MALE SPEAKER 26: Can the people on the teleconference let us know if they can hear us clearly. Mr. Elekes are you on? Yeah, it’s a feedback problem.

DR. JEFFREY: Okay. We will continue using the cell phone. Again, my personal apologies as director of NIST to the participants. I understand how frustrating this must be for you.

With that at this time I would like to call Dr. Alan FLATER and Dr. David Flater of NIST to present the core requirements and testing subcommittee preliminary reports
for the next VVSG.

DR. FLATER: I look forward with anticipation to the outcome of the discussion about the deadlines for the next iteration of the VVSG because I’m confused by the discussion that occurred particularly with respect to targeting the 2008 election cycle. My understanding was that the EAC has set the affectivity of the VVSG currently under consideration to target the 2008 election cycle. J.R. is shaking his head no. Well, I will look forward to clarification of how we are going to time the --.

As you can see we have a long list of things for CRT to discuss. Because timing has been very flexible, whatever I don’t get to by 2:15 this afternoon we are simply going to jettison because the other two subcommittees have already been squeezed as much as they possibly can in order to get what they need to say said. So we have ordered this list so that in anticipation of possibly having to jettison something. On the other hand if I finish early there will be great rejoicing because the other subcommittees can use the time.

At this point, something we might not get to, Item 8, research papers on VVSG maintenance. I would like to point
out that there is a document already in your binder titled, a very short document, titled “Maintenance to VVSG” which is toward the end of the CRT section which gives CRTs already existing recommendations with respect to handling short turnaround interpretations and errata to the VVSG. So I think you have already done that action item.

One of the reasons we have so much to cover today has to do with the timing of deliverables for the VVSG that the EAC currently has versus what’s been deferred. What appears in the current VVSG from core requirements and testing includes only revised glossary, the beginnings of a conformance clause and some fixes to the mean time between failure testing that appears at the end of volume 2. A great deal of material was in development within CRT for which the deadline has changed several times. What you are seeing right now is a dump of many things that were racing to deadlines that then evaporated. So that’s why you have so much material all at one time.

The first item I’m going to talk about is standards architecture which is the general term which includes all of the structural changes that we are looking at making to the VVSG. I’m going to talk to three specific points within
that profile - compliance, points and implementation

statements. The reason we are doing this, in addition to
being responsive to some resolutions that the TGDC previously
passed is that we see this reorganization as being necessary
to improving the precision of the standard, the testability
of the requirements and traceability to the standard.

Profiles are part of the strategy. One of the
definitions of profile that appears in the glossary is “a
specialization of a standard for a particular context with
constraints and extensions that are specific to that
context.” This idea is not new. In the 2002 VSF it was called
categories. There were separate categories for precinct
count versus central count equipment. There were separate
categories for paper based versus DRE equipment. These
categories were created because different requirements apply
depending on which category you are in. Because different
activities are performed in conformity assessment depending
upon which category of equipment is being examined and because
when you are looking to make a reference to the standard,
you want to make a traceable reference to the category of
equipment that you are talking about. Beginning with this
foundation using a more general profiles mechanism, we are
expanding this structure to include profiles for the supported voting variations, optional functions, things such as straight party voting which the system may or may not support, different profiles for the different independent dual verification that STS are talking about and other profiles as required as they are discovered.

These profiles, the ones that will be so-called standard profiles are listed in the conformance clause which is section 4.2 of the long CRT draft that’s in your notebook. The profiles mechanism is general enough that states can define their own profiles in a traceable way to the standard. If we have a state that wants the system to conform to the VVSG but wishes to add additional requirements of their own assuming that nothing they add conflicts with the standard there will be a mechanism by which they can define this as a formal extension of the standard and retain traceability to all the requirements that are in the standard.

I should mention if there are any questions, please bring them up as I’m going along because if we want until the end we could be waiting a long time.

Compliance points are part of our strategy. Compliance is really just a term that means an identified testable
requirement. We won’t use this in normal conversation but we use it when we need to distinguish compliance points from other requirements which may or may not be testable. High level requirements which are elaborated by compliance points for testing purposes. In order to get compliance points from what we have now, looking at the 2002 voting systems standards and the VVSG draft, it’s necessary for us to extricate compound requirements from one another when they have been written as free form test in paragraphs, combining many compliance points in one narrative. Having done that we will add new compliance points to add precision to the standards by clarify the general requirements, the sub-requirements that are either profile or activity specific.

Finally, when we do have requirements in the existing spec that are confusing, appear in various places, possibly conflicting with themselves, we will re-factor these into a more straightforward form.

The implementation statement. A very basic implementation statement is defined in the current VVSG draft. To this we need to add the notion that a vendor is going to formally identify the profiles to which the system is believed to conform. Having identified these profiles, the
test cases and conformity assessment activities that the test
labs will use will essentially automatically be identified
and finally, assuming that all these activities are completed
successfully, a certification the EAC would issue would be
only to those profiles that were claimed in the implementation
statement.

MS. QUESENBERRY: If I may ask a question.

MR. FLATER: Yes.

MS. QUESENBERRY: I just have a question about the
profiles. I’m looking in the draft so I hope I’ve got this
right. They are organized by voting activity, not by voter?

MR. FLATER: There is some misunderstanding. There
are two major sections of the standard one of which is general
requirements and another of which is requirements by activity.
Those are not profiles per se. Profiles are listed in section
4.2.

MS. QUESENBERRY: Right. I’m looking at that in the
notebook and I just want to confirm what I’m seeing because
I agree with it but I want to make sure that we’re not diving
off into uncharted territory. The profiles as I see them
listed are: Supported Functions, for instance, In-person
Voting, Absentee Voting, Ballot Rotation, Cumulative Voting
and so on. So those are all profiles by how the election is being conducted not but classifications of voters.

MR. FLATER: Well, actually these profiles were meant to represent optional functionality of the voting system. Most of them are going to support in-person voting.

MS. QUESENBERRY: Right, but they don’t say only people with limited English proficiency, for example. We’re not certifying systems by who will end up using them but by what they will do?

MR. FLATER: Correct.

MS. QUESENBERRY: Okay.

MR. FLATER: Now if there are additional requirements – Profiles are general mechanisms and any time that you have categories of requirements that may or may not be supported by a given system, you will create profiles as necessary to segregate those requirements.

MR. CRAFT: This is Paul Craft.

MR. FLATER: Yes.

MR. CRAFT: Is profile a term that we have invented here for this board or just a general work in art?

MR. FLATER: Basically what we are talking about for the sake of clarity is optional functions in the system and
we are talking about grouping those where we can and setting
out specifications for them.

The prior art for the use of the work profiles comes
primarily from ISA. There is a definition there. It is also
used in various other standard organizations to refer to
specializations or subsets of a standard. Now, I confess
that I have used the word profile in a way that is possibly
confusing to some even in the standards community and we are
working on clarifying that terminology. No, its not a new
word that’s just been invented. It is, however, a word that
may have been used too broadly.

MALE SPEAKER 26: Can you hear me now?

MR. FLATER: Try again, please.

MALE SPEAKER 26: This is used in many communities,
W3C of which we’ve -- some of the decisions we are making
on the new guidelines that we helped co-author get into
profiles in tremendous detail but, in general, profiles are,
like David says, a subsection of the standard intended for
a specific constituency.

MS. QUEENBERRY: (undecipherable).

MR. FLATER: Functionality as required by the
constituency. They are used, they are defined differently
in different standards. Typically associated with constituencies but like was just discussed here, that then infers the functionality that that constituency desires.

MS. QUESENBERRY: (undecipherable).

MALE SPEAKER 27: As an example (undecipherable) which I noted is not currently listed as (undecipherable).

MR. FLATER: Well, you could e-mail that to me John.

MALE SPEAKER 27: (undecipherable).

MS. QUESENBERRY: Well, let me be really clear. I would be perfectly happy to see a profile for an audio ballot but I don’t want to see the profile that says it's for blind voters. I want to see it for anybody who is using the audio ballot. Maybe saying that that bluntly will clear up the dancing around that I have been doing.

MR. FLATER: Well, speaking purely from the perspective of standards architecture, this debate is out of scope from the perspective of the profiles mechanism. I’m perfectly happy to put which ever words that we feel comfortable with but the profiles mechanism simply is a way of categorizing requirements and allowing people to make well-formed references to sets of requirements.

MS. QUESENBERRY: I don’t disagree with you. I was
just trying to inject a sort of corollary discussion which is how are we categorizing systems or how are we categorizing requirements? It doesn’t affect the notion that are categorizations but it certainly is something that the committee might want to discuss.

MR. FLATER: The strategy that was being followed so far was by functionality of the voting system. In the event that we need to add other kinds of profiles then we will cross that bridge when we come to it.

MR. CRAFT: And, as I am understanding it, a little confusion here, but the issue of say an audio ballot which is a general requirement now for all voting systems really would not be a profile. A profile from what I understood would be something such as ballot rotation which is an optional component which a vendor may or may not want to support and which certain jurisdictions would require. Within that profile there would be then standards for that particular profile.

MR. FLATER: That is correct. Formally speaking there is an all encompassing profile to which all voting systems conform. So, a requirement like that would be associated with that universal profile. By and large we only
define additional profiles where necessary to distinguish
requirements that would only apply to certain subsets of
voting systems.

MR. CRAFT: Well, basically, I guess, the concern
and confusion here, I think our exact use of the term profile
in the standards needs to be very clearly defined.

MR. FLATER: Yes, and this will happen because I have
succeeded in confusing some of the other folks at NIST as
well. So, --

MS. QUESENBERRY: Well, if it confused other
scientists I think we should count on a portion of the general
public being confused.

MALE SPEAKER 28: Just a suggestion, perhaps the use
of some examples when we get to issues like this to make it
very clear what we mean and what we don’t mean might help
in facilitating their conversation.

MR. FLATER: Well, I actually have a whole slew of
extra slides about profiles if we want to take the time to
look at them.

MALE SPEAKER 28: I think the issue was resolved.
It seems to be resolved.

MS. QUESENBERRY: I think we’re ready, I’m ready to
move on.

MALE SPEAKER 29: I do have one question. Thinking of the mind set of the test lab that receives an innovative product that perhaps in some way that we did not envision, blends two profiles, do you have some mechanism, say comparable to a technical construction file where the test lab can appropriate develop a test plan blending profiles for an innovative product?

MR. FLATER: In fact in those additional materials that I wasn’t going to present there is a formal definition of how you derive a new profile from existing profiles. When you do this you end up getting, a profile simultaneously relates to a subset of voting systems and a subset of requirements. When you combine two profiles what you get is the intersection of those sets of voting systems meaning those systems that conform to the requirements in both profiles and you get the union of the requirements.

MS. QUESENBERRY: David, perhaps you could circulate those materials just for informative purposes because I do think its important that we understand and have a common language to talk through these issues. This sounds like a very core piece of vocabulary.
MR. FLATER: I will certainly do that when -

MS. QUESENBERRY:: I think I get it but I’d love not
to take committee time to do that but I would love to be able
to review those materials.

MR. FLATER: I have a few pages that happened after
the draft that’s included in your notebooks that addresses
exactly these issues, gives the formal definitions that I’m
talking about and when I’m back in the office I will circulate
that to the TGDC list.

MS. QUESENBERRY: Thank you so much.

MR. FLATER: We are not at 12:11 with lunch scheduled
at 12:30. The issue with the standards architecture is
sorting out our requirements into testable compliance points
will take awhile. The identification referencing and
indexing of these compliance points puts a lot of strain on
the document production process and also issues with the
versioning (sic) of the standard.

Presently the nomenclature for referring to different
versions of the standard is being driven by the EAC in response
to legislative requirements in states that refer to such
things as the current version of the voting system standards
or what have you. There is also a critical need within the
conformity assessment process to be able to make a well-formed reference to the specific version of the standard to which someone is conforming or to which they have been certified. This is another half of this versioning (sic) issue that needs to be worked out.

I’m going to move on to software integrity and coding conventions which appears in the blue notes books in sections 4.3.1.1 and 4.3.4.101. What we are talking about primarily are requirements on the form, not function, of the source code. However, mixed in with these are some requirements that affect software integrity from the perspective of implementing them as defensive coding practices including error checking, exception handling, prohibitions on practices such as use of “go tos” instead of structured control flow which can increase your chance for blatant software faults. Within this software integrity sub-domain there is an unresolved overlap with STS. In the core requirements subcommittee we looked at these requirements from the perspective of, in general, we want the system to perform as intended. STS is looking at these requirements from the perspective of opportunities for a malicious person to cause the system to perform in a way it was not intended.
We end up looking at the same issues in the software so we have to discuss how to integrate our approaches to software integrity. I’ll talk more about that in a bit.

This also is not new. Beginning in the 1990 voting system standards that were coding, I forget the term that was used in those coding standards, the coding conventions. There was a TGDC resolution that brought these up again. In general, this is something we want to look at to enhance all these desirable ilities (sic) of voting system software. What we have now is a mixture of mandatory and optional requirements.

As it stands there are some coding conventions contained in the voting system, VVSG, but it’s also the case that vendors are allowed to substitute “published, reviewed and industry accepted coding conventions”. Now, I don’t know how much that’s done in practice. In the test reports that I have had the privilege of reading it appears that the conventions that were in the standard were being tested to. So, I don’t know to what extent this has been used.

MR. HARDING: I’m sorry. Please put in layman’s terms what the substitute “published, reviewed and industry accepted coding conventions” means.

MR. FLATER: Okay. The conventions that we’re
talking about are mainly stylistic conventions for source
code. If this were English text it would be Strunk and White,
if you are familiar with that reference. There is actually
an old book on coding style called The Elements of Programming
Style. Its sort of a parody of the elements of style from
Strunk and White. These conventions by and large are produced
not just because we want the code to be pretty but because
it gets us this other desirable iliities (sic) starting with
readability. Its very easy to make code completely unreadable.
Its very difficult to make it so that another person will
understand it. From understandability and readability comes
these other desirable factors such as errors will be more
readily apparent to the reader. So what this phrase refers
to is, under the current standards vendors are entitled to
use the coding conventions that are in the standard but they
are also entitled to use some which are considered published,
reviewed and industry accepted. Those terms are not defined
in the standard. Its just supposed to be commonsensical.
We are looking at coding conventions that the marketplace
or whoever finds to be acceptable.

MR. CRAFT: I think the example of where this comes into
play, J.R., is we had a system come through ITA testing that
was using, I think JAVA, for .net and which is not a real commonly used language and they were already coding based on some other industry standards which were not identical to those in voting system standards. They asked to be evaluated on the other industry standards and it was a reasonable standard and that’s how they were evaluated.

MR. FLATER: So the issues that arise with the coding conventions that are in the NIST standard are, they stem from the simple fact, which is in practice the best coding conventions, the best published, reviewed, and industry accepted ones tend to be language specific. The voting standards want to be language agnostic. There are some conventions that were added in 2002 which are language specific and this possibly made the situation more confusing because these are clearly not applicable to systems that use other programming languages. In addition, some of those environments had probably unintended consequences. I don’t have any published information about this but I have antidotally heard about issues such as vendors felt that the prohibition on one character variable names ruled out the Cartesian Coordinate System. They could not refer to x and y coordinates on the computer screen and their display drivers.
This is always an issue with coding conventions. If you make a blanket statement you never know what reasonable things you might be ruling out. One of the benefits of using published, reviewed and industry accepted coding conventions is that these issues presumably will have been worked out to a greater extent.

MS. QUESENBERY: David.

MR. FLATER: Yes.

MS. QUESENBERY: Might it not be a reasonable strategy to simply review some of those and list them as they are deemed acceptable?

MR. FLATER: You mean review, for the committee to review them?

MS. QUESENBERY: No, no, no. For instance you gave us a story about a vendor who requested to have his code reviewed against an industry standard and I presume that standard was looked at and deemed to be acceptable. Why not simply list the industry standards that are deemed acceptable?

MR. FLATER: Okay.

MS. QUESENBERY: I don’t know, maybe this takes us way too far off track.
MR. FLATER: If we wish to maintain that list over time and retire standards as they become obsolete and add new ones as they appear, then, sure, I mean, essentially you are crediting coding conventions. This has not been previously suggested but if we have a Stucky to do this, then yeah.

MS. QUESENBERRY: This is certainly out of my area of expertise but you are in effect doing that on a one off basis when you say, yes, we will let one vendor use one.

MR. CRAFT: If I may jump in here, David. What we are looking for by imposing a coding standard is to have code that’s well documented, that’s maintainable, that can be easily edited to make sure that it doesn’t have errors in it, and that is reasonably well built. I think any time you build code that actually meets a well thought out standard for that code, you are going to achieve that. I think probably the risks we are fighting against in source code reviews is those vendors who have a lot of ad hoc approaches to building code and you get code where obviously it hasn’t been built with a consistent standard and that’s when we find variables that aren’t properly defined and system errors that bite us when we get in the middle of an election. I’m wondering also,
if this doesn’t circle back around to profiles and having, you know, basically each language or each language in common use categorized as a profile and then a process for vendors who use either a language or a standard that doesn’t fit the established profiles then there is a process for accepting their coding conventions and perhaps retiring them as well.

MS. QUESENBERRY: David, we actually jumped ahead of you. You actually define what you think makes an acceptable industry standard.

MR. FLATER: Well, sort of.

MS. QUESENBERRY: Maybe we should just get you back on track and see if it clears all this up.

MR. FLATER: I’ll finish this up by lunch.

MALE SPEAKER 29: Optimistic.

MALE SPEAKER 30: David I would like to ask you a high level question. This approach to qualifying software has a heritage of its own in the voting community. My question is how effectively do you think we have reached out to other communities that have similar concerns for software integrity? Are we on the right track? What’s in my mind is we recently watched the software to find radio community which, of course, wants its software to never put the radio in a disallowed
state, reach out to the aircraft software which want’s to
make sure its software never puts the aircraft in a disallowed
state. Are we on the best track in the approach we are taking?

MR. FLATER: What you are talking about is
verification which, I’m going to be talking about later.
The coding conventions are one leg of the stool if you will.
They get us to a place where we can do verification. The
code needs to be readable if we are going to be able to verify.
Preferably it will follow some sane, coherent, repeatable
structure. My draft suggestion is that we remove, from the
standard, all of the conventions that are strictly stylistic
and externalize these. The language I used is not so much
different from what’s in there now. I changed it from
published – industry accepted to published credible with a
definition for credible which itself is going to be difficult.
This is completely compatible with the notion that someone
would be accrediting coding conventions. If we want to do
that, that’s certainly resolves the whole issue of what
constitutes credible. If we have a committee that’s deciding
which ones are credible, then I don’t have to write a perfect
definition of credible anymore.

However to what extent to coding conventions actually
address software integrity my proposal was to retain and expand these requirements starting with I-EEE has, making them more explicit for issues such as error and range checking and also adding a requirement for structure exception handling. This is sort of an extension – in 1990 what we had was “go to” considered harmful. I mean this had been carried over from like three years before. If we want code to be of higher integrity in general that we should encourage people to use structured control flow instead of random “go tos”. The requirement for structured exception handling takes it one step further saying, one error “go to” is considered harmful. In addition to having our normal control flow being structured, we would like our exceptional control flow to be structured, you know, a language that includes structured exception handling gives us more thorough opportunity to address the requirements that are already in the standard to do good exception handling. I’ll be coming back to this as an issue on a future slide.

Finally there is the issue of length limits. There was a length limit on modules that appears in the current spec. There was references in the current spec in several places to units as opposed to modules and there has been some
controversy about the terminology. The length limits need to be there to keep the voting code verifiable. If you have a module of unlimited length it becomes infinitely complex to verify it. So, by keeping a length limit on the module we try to keep the individual modules to the size where one person can intuit the module.

This was my draft definition of credible and I don’t like it either. I thought that the best possible outcome was that someone would propose a better definition but perhaps having a committee that instead reviews the coding conventions that are out there would be better than coming up with a good definition of this. However, I don’t know who’s going to do that.

First of all, as I said, the definition of credible is problematic. There is also an overarching issue here about the direction that’s been taken in the coding conventions for software integrity. We seem to be well down the road of writing prescriptions for how to write code that has high integrity. Where does this fit in with strategy that the STS subcommittee is looking at for doing security reviews? Could we not have an open ended expert review for software integrity without any particular prescriptions about adding
things to the code to maintain integrity? These reviewers
would then say well, what you’ve done here is acceptable or
what you’ve done here is not acceptable.

MS. QUESENBERY: Who’s your committee?

MR. FLATER: That question I will defer to STS. The
compromise that I’m looking at now until otherwise instructed
until we have this meeting with STS is that I’m making the
prescriptions fairly conservative and on the assumption that
this is not going to be the complete picture. These are things
that can be easily done when a system is developed to foster
high integrity code but the final evaluation will be done
by expert review.

MALE SPEAKER 30: If I could just support that. I
think it’s the right attitude that we want to maintain here
that these are complimentary approaches. One is sort of low
level technical workmanship kind of issues and the other is
the high level architectural review for major faults in
implementation.

MR. FLATER: Very good. The last slide in this
subsection. With respect to coding conventions, public
comment was received saying that the NASIT technical
committee has previously ruled that assembler code is
permitted as long as the code meets all other requirements. This raised some questions because if you read the existing standard, assembler code is already permitted everywhere except in tabulation related code. It is understood that you are going to need this for device drivers and things like that. At this point in time I’m not sure what the issue is and I’m hoping to get clarification. Are we talking about assembly language in tabulation code and if we’ve got that what is the rationale? Why did we need to have that?

Finally the structured exception handling issue is very simple. Some people’s language of choice is the C programming language and C does not have structured exception handling. We are talking about annoying a group of people here. Those folks who use C are going to have a lot of trouble with this recommendation. I have no trouble with it at all. I’m not sure where to go with that at this point except perhaps a general sense of is the C language something we can afford to annoy?

With respect to the requirements having to do with software integrity its seems very unlikely that there isn’t prior art having to do with writing high integrity software. We know that there’s been some special publications out of
NIST that I’ve look at. We know that there’s a lot of prior art in the military. Most of what I’ve see so far is two dated to be directly applicable. There has to be something out there. So, I look forward to receiving the reference that will allow me to purge all of the software integrity related coding conventions from the VSS and replace it with a reference to prior art that has been much better developed.

Its now 12:32 and its lunch time. If there are any final questions we could break for lunch.

DR. JEFFREY: Are there any questions on the first two sections of the agenda that he covered which is the standards architecture and the software integrity and coding. Any additional comments, questions? If not, let’s reconvene at 1:30. Again, I think for the public, there was a discussion of where some of the restaurants, local restaurants are and for the TGDC I think we are just across the hall.

Thank you. See you in one hour.

MR. CRAFT: Here.

MR. GREENE: Craft is here. Gale

MR. GALE: Present.

MR. GREENE: Gale is here. Elekes.

MALE SPEAKER 31: Can you turn up the thing. Is Elekes there?

MR. GREENE: Elekes is here? Gannon.

MR. GANNON: Here.

MR. GREENE: Gannon is here. Harding.

MR. HARDING: Harding is here. Miller. Miller is not responding but we will check back. Purcell. Not responding. Quesenberry.

MS. QUESENBERRY: Here.

MR. GREENE: QUESENBERRY is here. Rivest.

MR. RIVEST: Here.

MR. GREENE: Rivest is here. Schutzer not present. Turner Buie.

MS. TURNER Buie: Here.

MR. GREENE: Turner Buie is here. Jeffrey.

DR. JEFFREY: Here.
MR. GREENE: Jeffrey is here. We have at least nine with the possibility of three more on the phone. I’ll turn it back to you.

DR. JEFFREY: Okay. Thank you. David go for it.

MR. FLATER: I told my colleague Alan Goldfine that I will finish by 2:00 so that he can have fifteen minutes. I’m going to proceed quickly.

Methods for conformity assessment covers a lot of territory. Quite often we simply talk about testing but there is more to it than just testing. There is also the reviews which include these reviews which I have listed here potentially. What I’m going to talk about are two things from this list. First the logic verification and then test protocols.

First logic verification which unfortunately presently is spread across several sections because there is a section where it says that the ITA shall do this and there is a section that says the vendor shall do that. That’s unfortunate but the important bits, I believe, appear in section 4.52, the logic model. Logic verification is a formal characterization of software behavior within a carefully restricted scope followed by proof that this behavior conforms to specified
assertions. The asserts that are of most interest to CRT boil down to the fact that both are reported correctly in all cases. Logic verification compliments testing, what is sometimes called falsification testing as a counterpoint to verification because if you run any set of test cases the most this will tell you is that, in the best case, the behavior is correct in those cases. What we really want to know is will the behavior be correct is all cases? That’s where verification comes in.

Motivation is a response to a TGDC resolution. Also it provides a higher level of insurance than just doing the functional testing and also this is sort of the other – when we saw the requirements for coding conventions, it was like we were waiting for the other shoe to drop. Surely we are not just sticklers for coding file. There is a reason why we want the code to be readable. The reason is that we want it to be verifiable.

Logic verification works, at least in the draft as currently proposed, by having the vendor specify pre and post conditions for each callable unit and a source code, a callable unit is something along the lines of a function procedure method, that level of construct. Vendor approves
the assertion regarding tabulation correctness and these proofs are then reviewed by a testing authority who issues findings that if everything is okay, that the pre and post conditions correctly characterized the software and the assertions are satisfied. Issues with doing logic verification include the fact that training is required. You need, I would say, a bachelors degree in computer science to have been exposed to this material. Also verification has a reputation of being onerous. This is because if you try to do it without a limitation on the scope, you very quickly get an impracticable problem. In this case we try to carefully define a scope to cover tabulation. This gives us some assurance that the tabulation logic is correct. However, this does not give us a blanket assurance that the entire system is going to behave the way that we hope. For example, if the user interface has been compromised to turn a yes to a no and a no to a yes, it doesn’t matter that the tabulation code counts the noes and the yeses correction because they have already been sabotaged. We are looking to STS and their open ended review to cover those kinds of eventualities. Wow, that was quick. Are there any questions?

MALE SPEAKER 31: Which profiles are required to
have a verification?

MR. FLATER: I believe that all systems will be covered by this.

MALE SPEAKER 32: So any system that has tabulation functionality will be required to have a verification?

MR. FLATER: And that’s all of them. If they don’t count votes, I don’t think it’s a voting system.

MALE SPEAKER 33: (undecipherable) systems will come into this?

MR. FLATER: Oh, you want to do it that way.

MALE SPEAKER 33: Well, a scanner too.

MR. BERGER: Basically your election definition system is the part of the system which not only defines the balance but creates the data base in which results are going to be dumped and creates the links between candidate positions on balance and their associated data fields. Even though it’s not tabulation software, it’s a very important part of the system. It certainly should come under this kind of review.

MR. FLATER: Agreed that it is, I mean all the parts of the system are important. To get into the details of the scoping, the scope extends from the abstract definition of
the contests and candidates through to the reported tallies.
Ultimately it is what shows up in the report that you care able.

MR. BERGER: Okay. So you are counting all of that in the tabulation.

MR. FLATER: That is in scope.

MR. BERGER: Okay.

MR. FLATER: Okay. I’ll proceed to test protocols.

Test protocol was a term arrived at after considerable negotiation to describe what might otherwise be called the test suite plus additional infrastructure. What’s been bundled under test protocols includes a general test template meaning generally when you are going to execute test case, a testing scenario this is how you do it. There is a certain set up to an initial state. You run the scenario. There are some things you do afterwards and this is how you look at the result.

Also general pass criteria. How do you interpret the results and map that onto pass/fail for individual test cases as well as an overall pass/fail verdict for the entire testing campaign? It also includes a collection of testing scenarios with implementation specific behavior paramaterized (sic)
or abstracted out. That part is unavoidable because we do not have a standard software interface to voting systems. Presently we can abstractly define the testing scenario, this is what we are going to do, we are going to have these contests for these candidates and vote for the following and check the result, it should be this. Lacking a standard interface we can’t give you a software program that is going to do this on the voting system. Many of the voting systems, well, all voting systems I think it’s safe to say, are designed to take input human beings and human beings alone. The idea of automating this testing is basically a non-starter.

The collection of test cases that you have in the draft there is sort of a baseline, strawman for just generic core requirements type of testing. This does not cover any of the interests of human factors or security. This is just general functionality type of testing and there is one test scenario there, at least one test scenario, for each of the voting variations listed in the profiles. There is a compromise as we start looking at expanding this test suite that, yes the bigger it gets the more thorough your testing is, on the other hand, the longer and more expensive it is. At some point a decision will have to be made about how big
this kind of test suite can get. Its possible at some point
that performance based usability testing might be integrated
as part of this infrastructure. Motivation for this is being
responsive to resolutions about test methods, uniform test
method procedures, and also to improve reproducibility in
general. If we give a testing protocol that should be followed
as part of every certification process, we have improved
reproducibility because we at least have confidence that
those test cases have been executed, will be executed
regardless of which lab a vendor goes to. This does not give
us perfect reproducibility but is a step in the right
direction. It does not replace, but it augments the
implementation dependent white box structure and functional
testing that is already specific in the VVSG. This kind of
testing, because its implementation dependent, because each
test lab working with the vendor is going to be designing
a special set of test cases for each system, is not going
to be as reproducible. If you do it again you are going to
get a different set of test cases, but this testing is
necessary nonetheless.

Finally, we have the opportunity as we are running this
test suite to get a better estimate of error rate and mean
time between failure than what we get doing a single catchall
test which appears to be what’s presently specified. Issues
with this, as I discussed, the implementation dependent
testing is not made redundant by this. There is still going
to be reproducibility issues there but this is a step in the
right direction.

If we want to test combinations of feature clearly we
are not going to have a voting system that only supports in
person voting with no extra voting variations. The more
different combinations of features you have the larger your
test suite has to be to cover these combinations. I think
the compromise that we are looking for here is to identify
what are the most common of features and make sure that there
are test cases to target that combination feature. As with
the typical case tests, this is something where we could
really use some feedback from election officials to give us
more realistic tests that more accurately reflect the usage
of the systems in practice and what the systems that they
use, what combinations of features that they actually
support.

There was some discussion at the standards board meeting
in Boulder concerns about the mean time between failure
testing that’s currently done, concerns that would be
partially addressed if we made sure that the scenarios used
in testing reflect the actual usage of the systems in practice.
Questions, comments?

MALE SPEAKER 34: I have one question. That issue
on getting the typical cases for the testing. Do you have
a plan in terms of part of the outreach of how to get those?
What’s the mechanism by which you are suggesting that those
typical test cases get generated?

MR. FLATER: I don’t see why they couldn’t simple
submit them as public comments through the NIST website as
it is now. It needs to be in the public domain anyway for
us to use it. So, why not just submit it through the public
process?

If there are no further questions on that, I’ll go on
to –

MR. CRAFT: David, I have one comment. Unless we haven’t
got to it, one thing that seems to be missing here is basically
risk assessment and arriving at test plans because we all
know testing is a sampling methodology and what we, who have
been testing these systems for a number of years did, is take
our knowledge of the strengths and weaknesses of particular
systems and our knowledge of some of the difficult issues
in election administration and, after reviewing the technical
data package for a new version of the system, we create pretty
much a custom test plan which is based in large part on our
assessment of the risk of different aspects in that system.
What I seem to see here is perhaps a cookie cutter recipe
approach to testing where there is going to be a recipe list
of test suites and test scenarios that you will run. I’m
not seeing the piece where the labs apply some reasoned
judgment in determining which particular test to run on a
particular system.

MR. FLATER: What you described falls in the category
of implementation dependent, white box testing which is
currently specified in the VVSG. I’m nor proposing to change
that in any way except possibly to change the text to clarify
it. That is not made redundant by this. What this does is
it helps you improve the reproducibility by giving you a
baseline set of tests but by no means am I suggesting to
eliminate what you just described.

MR. CRAFT: Okay because that basically in reviewing for
several years now the work product of the ITAs, those are
the exceptions that I get where their judgment and as to which
test suite is applicable, I wind up not agreeing with for some reason or another. That’s an area that I think we actually, probably need to expand as to what the appropriate method is for assessing those risks and for documenting that they have been properly assessed.

MR. FLATER: Certainly there is the opportunity to add some informative text about that. As usual, we welcome any contributions.

If we are ready I’ll go on to casting, counting and reporting requirements. Most of these which appear in the draft that you have before you are derived from requirements in the 2002 voting system standard. What’s different is that they have been re-factored to clarify them and reduce redundancy in cases where the same sort of requirements appeared in two or more different places in the VSS. Also, a minor edit but perhaps very important to members of the committee is, I have begun the process of separating election administration concerns and I would like to cite a specific example if I can.

This is the 2002 voting system standards, volume 1, section 2.4.2. It says “to activate the ballot all DRE systems shall, among other things, prevent a voter from casting more
than one ballot in the same election.” Now we might charitably interpret this to mean that while what we mean is that once you’ve got a card you can only activate the ballot once. The feedback that I have received consistently says that this requirements is enforced procedurally. The voting system does not identify voters. The voting systems knows about ballots. The assignment of ballots to voters is done by the poll workers. Responsibility for enforcing this requirement belongs to poll workers and election officials. So, what I’ve changed, if this will come up, is now a requirement in the best practices section. It says, “The voting process shall prevent the voter from casting more than one ballot in the same election.” The glossary definitions of voting system and voting process are such that voting system is primarily the equipment, documentation and other attachments thereto. The voting process is the big picture including poll worker and the procedures that they perform. We may, ideally, like to dream of a world in which a voting system might be able to enforce such requirements but it seems to be incompatible with privacy requirements and certainly it would not be realistic.

MR. CRAFT: Well, David, if I could jump in again. It’s
Paul Craft for those on the Webcast. What we actually need here, and this is a good case for discussion, what we need is for a voting system to provide support for an election official to set up procedures that would prevent a voter from casting more than one ballot. Examples of that obviously with a marked sense, paper based system the election official can control handing out the ballots. With a DRE or a test screen there has to be a design that will prevent a voter from casting more than one ballot on a single activation of the device. There has to be a design element that allows the election official to control the activation of that device separate from the voter. I agree with you that its an election procedural issue but its something that one way or another the voting system has to give the administrator some tools to execute that procedure.

MR. FLATER: I agree completely and its simply a matter of elaborating these requirements and drilling down to what exactly the functional requirements on the system are. In some cases I have already done this. For example, the voting process shall prevent modification of the voter’s vote after the ballot is cast. There is a reference here systems conforming to the DRE profile shall prevent
modification of the voter’s vote after the ballot is cast.
The DRE can do this. If you’ve got a paper based system, I mean, what are you going to do about it? So, these are the kind of requirements – what we need to do is in cases where these have been intermingled in the old standard, we need to separate out the concerns very clearly. I have six minutes.

All right, so I was on this slide. We did this, all of this, because we want precise and testable requirements. Significant changes relative to the 2002 VSS requirements are primarily in the reporting section. The reporting requirements were, in some cases, duplicated in the old standard and in some cases, they were vague. I have significantly revised the requirements on the content of reports to try to make it clear what exactly needs to be reported and also, instead of simply having a requirement saying the tally shall be accurate there is now the logic model to give an abstract definition of what that means.

With respect to reporting, some of the things that came up there was in the old standard discussion of cast versus counted and there was verbiage in one place that said in the case of paper based systems we have to identify the number
of ballots both processed and unprocessable. When you look
at this at a higher level we see that there is really three
concepts here. Cast, read and counted. In the case of paper
ballots you can have a ballot that’s cast that is never
actually read by the system. Usually because, in fact, it
is unprocessable. It won’t event go through the scanner or
what have you. In the case of DREs it is hard to envision
a case where it would be cast but not read unless there was
some hideous failure.

There was some issue of reporting levels, that there
were requirements in the spec about “the system shall support
all reporting levels that the state need.” They didn’t say
which state. Looking through the standard there were four
different reporting levels that were specifically mentioned.
It was by tabulator, by precinct, by election district and
by jurisdiction used as a euphemism for state. There is no
requirement for generic facility to define arbitrary
reporting context or reporting levels. It is permissible for
a vendor and I imagine this is what they do to customize the
voting system for each customer to provide whichever voting
levels they require. What I’m proposing is that what we are
going to require for all systems is these four levels and
everything else is gravy.

   Another issue has to do with write in ballots. In systems where we have, where the processing of write in ballots it done manually and possibly not at all if the election isn’t even close, that final tally is completely outside the voting system. The question is, in what sense could such a system in that process conform to the write ins profile? It depends on how you define the write ins profile. I would imagine that we are simply going to say in this case the voting system, meaning the equipment, doesn’t because its not counting the write in votes. You could talk about the voting process supporting write ins but really this is being supported procedurally and not by the system.

   A similar issue has to do with unofficial reports and data. There are some requirements in the standard now about unofficial versus official reports. There was some discussion in Boulder about different requirements, security requirements on unofficial versus official data. It appears to be the case in some jurisdictions that official data equals unofficial data plus somebody’s signature. That’s outside the voting system too. So, would you like to comment?

MR. CRAFT: Well, that was a little superficial. I mean,
the difference in unofficial results and official results is basically the extent of review and scrutiny the results have been under. Unofficial results are generally meant to be those results which you take in from the precincts and you publish on election night and different jurisdictions have different standards as to how tightly those results are reviewed before they are released. Obviously you don’t want to release results with gross errors in them.

Official results are those results after the entire canvas process is through, after your provisional ballots and all of your write in ballots have been through whatever review and appeals process the state sets out for those and in our state, it is a requirement that you actually audit the consolidated results for the county back to the individual precinct report signed by the precinct board and that is the work product which, at the end of that process, the judge and the canvassing board do attach a signature to. Frequently a different result from the unofficial.

MR. FLATER: Would you agree that the distinction between official and unofficial data is not a voting system concern?

MR. CRAFT: I think it is not a voting system concern.
It is an election administrative concern. It is also, though, an area where we are beginning to look to the voting system vendors to provide support for that administrative concern. What I’m looking for in Florida is, as the canvassing board makes those determinations, finds those additional ballots which can now be counted for one legalistic reason or another, then the system has to be configured so those ballots can be added to the automated totals, either manually or by scan.

MR. FLATER: Are those provisional ballots?

MR. CRAFT: They would be provisional, they would be write ins that have been challenged for some reason, military overseas. They will, in the rare case, be where the canvassing board revisited a precinct and found there were, you know, two or three ballots that had not been scanned for one reason or another. I think it’s another issue where, yeah, it’s an election administration issue but it’s also something the voting system needs to be designed to support.

MR. FLATER: Okay. I think we are in a good place then.

I’m going to skip the process model and let Alan Goldfine present what he’s going to present.

MR. GOLDFINE: Are there any last minute questions or
discussions for David before he disappears?

MALE SPEAKER 35: Good job David. I like the product the way it's coming along.

MR. GOLDFINE: No, no. he’s not allowed out. We are going to lock the doors until the end. I must say that I anticipated being squeezed this way so what I wrote was a high level overview of the remaining half of the CRTs work, pretty much what we’ve done, what we’re doing right now and what we’re planning to do. I’m going to be talking about the performance and workmanship requirements in the VVSG, talk about an issues paper that I put together extracting the issues and open questions from the latest work, briefly talk about two earlier research papers that we wrote and about the future work.

In terms of the performance and workmanship requirements, this is for both hardware and software David has talked a little bit about the software aspects from the more general hardware and other areas. What we did is, and unlike some of the other areas in developing VVSG, we specifically began with the text from the 2002 VSS. We then extracted or imported relevant requirements from this document. You may remember that the current existing VVSG pretty much took all of the
performance and workmanship requirements unchanged from the
2002 specs and put that out as part of the current standard.
What we are now doing is taking a closer look at these to
see what issues there are with them. Are each of these
requirements testable? Are there any omissions? Are there
any changes in technology that would require additional or
changed requirements? Many of these issues were dealt with
at some length a few months ago in the analysis tables that
were included in the April presentations but which we never
got around to actually talking about but it was a major part
of that second volume. If you go back and take a look it’s
a table of all of the requirements in the 2002 VSS along with
our initial conclusions as to what to do with them. Now we
are actually doing to them what they require.

We then took these extracted and to some extent reworded
requirements, revised them by looking at the latest draft
that I could find of the I-EEE, P1583 spec. They also had
the task of looking at these requirements. Made some changes,
added a few and we relied, especially in these areas of
performance and workmanship, we relied very heavily on the
I-EEE, figuring, you know, they are among the great experts
in this sort of stuff and borrowed liberally from what they
are doing, at least the latest version of what they are doing. These requirements were then reviewed by the NIST team, by CRT and, really for the first time in connection with this meeting, we are presenting it to the TGDC as a whole. These documents included, as a major feature, issues and open questions which were highlighted in green and, you know, represent areas that, you know, at some point, answers are going to have to be made, provided to these questions, whether in this context or in some other context because before too long they will start to hold us up, you know, whether we answer a question this way or that way.

We prepared an issues document which is also included in your package highlighting the major issues, you know, rather than the are there any holes here or any other requirements. Those are generic things but specific questions that we have are highlighted there. Through the whole document there are about twenty issues that between David and myself. I’m only going to bring up one of them here. These papers are all on the C.D.

One issue that I want to bring up, which is probably, ultimately and EAC determination, but I’m sort of hoping that maybe I could get the sense of the TGDC, is should the VVSG
explicitly deal with punch card systems? My reading of HAVA, you know, seems to be that while HAVA doesn’t forbid states and really doesn’t have the power, but it doesn’t forbid states from continuing to use punch card systems in a non-standard way if that’s the way they want to go. HAVA does imply that the Federal Government shouldn’t support, shouldn’t explicitly support the use of punch cards which to me in turn implies that VVSG should not include any requirements for them. There’s a little bit of a difference of opinion within the NIST team regarding how to handle this for the foreseeable future since there is no definitive answer. Should we go to the trouble of developing a punch card profile, if you will, in the chance that the final interpretation of HAVA is, yes we do have to cover that area or shouldn’t we. I’ve taken the approach, no, and in the stuff that I’ve done I’ve never mentioned punch card systems. Other people and to some extent have taken a different approach. So, I, you know, I don’t expect a resolution here but I am curious as to, if there is any time for discussion, what the sense of the committee is, the sense of the TGDC. Does anybody want to quickly say something?

MR. CRAFT: Yeah, I’m not going to touch on the legality
of punch cards under HAVA because as far as that particular
issue I don’t have a clue, but if in fact punch card systems
are legal under HAVA, then I think there is a really good
body of prior art developed by IBM I guess almost fifty years
ago, which is still applicable. There are, I think fairly
good treatments other than the 2000 voting system standards
and then I think we need to go beyond that and look at, okay,
now how are we, if we are going to allow punch card systems,
do they have to be designed so that they prevent over votes.
Do they have to be designed, obviously they have to be
designed so they can be blended with an audio ballot component.
We have to, I think, put an entire system boundary around
those systems as opposed to just having them be a tabulation.

MR. GOLDFINE: That’s the whole issue. I just
mentioned at lunchtime today I heard a rumor which is really
all that it is in my mind right now, that the EAC dealt with
a somewhat, or has dealt with a somewhat similar issue namely
the –

MR. CRAFT: Lever action voting machine.

MR. GOLDFINE: Yeah, the level machines and so on and
did come to some sort of conclusion regarding, which as I
understand it, is a negative one. HAVA does not mandate
Federal standards for lever machines. I think that they are going to sort of have to deal in a parallel manner with a punch card issue. We need guidance.

MS. QUESENBERRY: Well, wouldn’t a punch card machine or any other machine have to at least meet all the general requirements?

MR. CRAFT: Yeah.

MR. GOLDFINE: Yeah but there are plenty of requirements that would then have to be specific for punch card systems and if we don’t have to develop those, I would be very happy.

MS. QUESENBERRY: I guess what I’m saying is you could cover punch cards by saying they have to meet the general requirements without necessarily having –

MR. GOLDFINE: Then you would be doing half a job.

MS. QUESENBERRY: Without never having to go into them in detail because they are a (undecipherable) system.

MR. GOLDFINE: Then you would have to start defining what a hanging chad is and all that and –

MR. CRAFT: No, that’s an election administration issue and a legal issue but you do have to define punch card stock, which IBM’s done a rather good job of. You do have to define
exactly how thick the chad ties at the corner are going to be and a very good job of that was done in the 1990 standards. There is a lot of issues that you haven’t brought in but I think there is prior art that covers them.

MR. GOLDFINE: So, my intention in the two minutes remaining is to just put it on the floor and let it percolate within the committee, you know, up to the EAC, whose listening and so on and just go on from there.

Okay, real briefly, just to mention also in your package are two research papers that we wrote in response to two of the earlier Resolutions 3105 and 3205.

The first one, maintenance of the VVSG actually deals with the issue or some of the issues that was brought up by the resolution this morning having to do with interpretations or procedures for interpretations of the standard, resolution of errors discovered in the standard, what happens to, how are implications of discovery of errors handled and so on. There is in fact, I’m pointing out here, a draft research paper that does deal with those issues. It’s a strawman that’s out there for examination and comment within the committee and so on. I do commend it to your attention in connection with the issues of this morning.
The other paper has to do with sharing information regarding certification or decertification of voting systems. The original resolution dealt with sharing of information and decertification. I drafted it, I concentrated, I focused mostly on the procedures and policies regarding sharing of information in general. There are a lot of knotting issues in there as well concerning proprietary information, sharing of information with localities versus sharing of information with the general public. Again, its, you know, a draft out there for comment.

Future work for CRT above and beyond anything that can be inferred, continue to develop the existing text, address the comments that we have been receiving in drafts that we have been sending out, putting up on the web, submitted to the TGDC and so on. We have to, at some point, being to add, this has come up before, add informative text to give shape to the normative text which are the actual requirements. From the point of view of subcommittee we have to continue to integrate or do this more thoroughly, integrate with the other two subgroups, security and human factors, the glossary has been pointed out is continually being revised and continually needs to be revised to accommodate new
definitions all of the time as they arise. We are, of course, going to have to draft standards on data to be provided. This is all in the time line. Develop logic and accuracy testing procedures as David pointed out and ultimately, of course, draft a testing standard which we’ve done a little bit of. If you take a look at, for example, David’s paper from earlier, probably just enough to give a hint of what some of this stuff is going to look like. That’s got to be done for the entire standard as well. And, only two minutes over my time I get to the discussion part. Are there any questions, I guess for either David or myself at this point?

DR. JEFFREY: NIST believes that the preceding preliminary report of technical support on core requirements and testing subcommittee preliminary report for the next VVSG iterations responds to the relevant TGDC resolutions and so, basically, unless there are supplemental directions or corrections, the technical support related work product will continue to be developed consistent with this preliminary report. So, are there any questions, further directions or corrections that the TGDC would like to provide? If not, do I hear a motion to adopt the preliminary report?

MALE SPEAKER 36: So move.
DR. JEFFREY: Is there a second?

MALE SPEAKER 37: Second.

DR. JEFFREY: Is there any discussion? Okay, without discussion I will ask for a unanimous consent for accepting the preliminary report. Now you can leave.

MR. GOLDFINE: Now I can leave. I just want to remind everybody, look at that issues paper because that distills the issues that we, most of the issues that we are actually, currently struggling with and need guidance. The technical issues. Take a look at that and see if you can comment to us, you know, directly, on line, what have you. That would really be -

DR. JEFFREY: And I would say that the punch card issue is still sort of hanging out there.

MR. GOLDFINE: The punch card is one of them, which is probably the one most easily explained but there are twenty others that need answers.

DR. JEFFREY: Okay, thank you, thank you. At this time we have Dr. Sharon Laskowski of NIST to present the human factors and privacy subcommittee preliminary report for the next VVSG iteration.

MS. LASKOWSKI: Thank you. My slides are a little dense
because I wanted to have stuff, visuals in case there was discussion. Really there are three main items that I want to talk about.

First, what have we done so far and why? Second, what is the research currently under way? And third, after the May 9 draft there have been some comments from places like the Standards Board Advisory Board to the EAC so another set of issues has arisen and in particular the one about personal, assistive technology which you also have a white paper in your handouts that discuss. So, I wanted to make sure that we at least get to discussing that issue. I will skip over some points on the slides, as I said, because I just want to emphasize those three main points.

As you know, the language in HAVA continues to guide our work. We are concerned about addressing accessibility. We are concerned about how to describe and write guidelines for the accessible voting station. We have addressed alternative language accessibility as well right out of HAVA. There are four key principles that guides our work so far. We need well designed, these are from the resolutions that were passed in January, that we need well designed systems and that are effectively deployed in the polling place.
Ballot design and instruction are a critical part of the voting experience. We want to push for all voting machines eventually evolving into having more and more accessibility to more people. Finally we also believe that setting performance rather than design standards encourage innovation and also make the standards simpler and easier to update.

There were five additional resolutions that directed our approach and our priorities. Those are accessibility requirements our top priority. We concentrated on accurately capturing indication of a voter’s choice. Guidelines for those. That all requirements that involve human interaction has to ensure some basic level of usability, accessibility and privacy. That the standards themselves must be useful. People often look over to Whitney when they talk about writing standards. That we would like to establish performance benchmarks for usability. We have made some critical decision in our work. We focused primarily on the equipment itself in that first phase as opposed to looking at, for example, ballot design, things that are specific to an election. We also kept in mind that requirements need to be testable although you will see and this has caused some
confusion and I think it calls to the usability of the standard. We have the standard as written as a tree so that there are high level goal statements and under those goal statements, if you look down the tree to those guidelines that have the longest set of numbers in the outline, those bottom level are the testable requirements. I think we are going to revisit how to present that and how to explain that so it become clearer to more people because some confusion has arising as to a goal statement not being testable and the leaves underneath that tree are testable.

I’ve already talked about performance versus design guidelines. We also recognize that the environment that a system is deployed and is also critical to usability and accessibility and we also said there are some shoulds in the requirements that we expect will migrate to mandatory shall statements but we felt that the current technology didn’t quite support that yet so this was a placeholder and to put vendors and the voters on notice that eventually these will be mandatory requirements.

So, in summary, the current VVSG we updated and enhanced. Accessibility in section 2.27 we added limited English proficiency requirements. We updated enhanced and promoted
from an appendix many usability guidelines. We added privacy requirements. We also added some other elements like recommending (undecipherable) usability testing. We worked to clarify some ambiguous requirements. We also advised on the VVPAT section and included some human factors guidelines there as well. That’s the first part of my talk. Discussion? Everyone’s nodding. That’s just the outline just to refresh your memories, accessibility, usability, alternative languages and privacy.

Current research underway to further address the resolutions that I discussed in the future VVSG. Primarily our biggest effort is to develop some usability test protocols and identify some usability performance benchmarks and what those metrics to measure benchmarks that we expect to be reproducible and repeatable testing. Putting together a set of plain language guidelines for clear ballot wording, instructions, error messages to the voters and poll workers, eventually documentation. Guidance on good ballot design. Guidance for interaction design. Interaction design primarily on the DRE, we’ve got to navigate through either with next buttons or whatever through the ballot. That’s interaction design. Usability of the standards. We are
further refining accessibility based on ongoing research and feedback. The development of test methods. That’s the second part of the talk, the current research focus that is ongoing now. Any questions or comments about that? Okay, the third part.

Various advocacy groups and particularly the advisory board and standards board have pointed out additional issues in the draft VVSG. Primarily the deal with accessibility. A number of them can be addressed fairly easily. We’ll do a little background work and write up a paragraph or two clarifying for the most part but there are some that require some thoughtful research on possible solutions and developing some sort of guiding philosophy to the approach that would guide what those guidelines should look like to address those concerns. I’ve listed the main issues that are causing some debate in the community.

The big one that I wanted to talk about and I have a number of slide on, is should the voters be able to connect their personal assistive technology to the voting station. I’m going to go through the list and I’m going to come back to that so we can go through the six slides on that.

There’s been debate on whether the requirements for
non-written languages are clear enough.

It's been pointed out that the dexterity requirements are not as strong as those dealing with visual disabilities.

There's been some questions about whether the low visual requirements should be made stronger or not, more stringent.

Can the requirements for speech and the audio be less production specific, more quality oriented. We think we have a solution to that.

By the way, I should mention, I have a slide for each of these issues in case we do want to discuss any one of them. I can bring them up after we discuss the PAT issue.

Vote by phone. Vermont is experimenting with this so there's been some question arising from the implications to those with disabilities to vote by phone. So research for that needs to be looked into.

How should best practices for election officials in using voting systems be communicated. This is a disability standards issue. They were initially integrated into the VSG and they have been pulled out into an appendix. We need to revisit the usability of that.

Should versus shall questions come in and just the general overarching issue. How do we factor in feasibility
and cost. That’s always been an overarching concern.

Now I would like to talk more about the personal assistive technology issue. If you look at the voting system standard 2002, 2.7.1 and the current version of the VVSG, section 227.12 you see the wording has changed. Let me read the wording and what we’ve done is an analysis of why there’s been confusion and there’s really two concepts that we needed to pull out and clarify in order to understand what’s going on here and understand the ramifications of these two statements because each are goal statements and underneath the requirements would look much different depending on which one you used. In the 2002 VSS, “DRE voting systems shall provide, as part of their configuration, the capability to provide access to voters with a broad range of disabilities. This capability shall not require the voter to bring their own assistive technology to a polling place.” In other words this is a sufficiency clause. VVSG 22715 and accessible voting stations shall provide accessibility to voters using their own personal assistive devices.” This is an interoperability requirement. Sufficiency and interoperability are related but they are independent notions. Sufficiency is what access features, unrelated to personal
assistive technology that a voter brings with them, must a
voting system contain to meet the accessibility requirements
under the VVSG and HAVA? Interoperability really asks the
question of what these features must a voting system provide
to allow an accessible voting station to interact with
personal assistive technology that a voter brings to the
polling place. So, when you talk about allowing connection
of personal assistive technology to a voting station the
security is clearly an issue. I’m just going to go through
some of the finer points here. Any kind of connection ports,
especially standard IO ports create a security risk by opening
access to the voting system. We might look to section 508
of the Rehabilitation Act amendment which provides a useful
definition that guided the 508 standards development for
accessibility of electronic information technology developed
by the access board. They used the notion of self-contained
products. A self-contained product shall be used by people
with disabilities without requiring an end user to attach
assistive technology to the product. Personal headsets for
private listening are not assistive technology. One might
note also with personal headsets there is a standard foot
jack and it only takes output, it doesn’t allow the assistive
technology to do any input into the system. In fact, the VSS and the draft VSSG delivered on May 9th had underneath it this self-contained note at the recommendation of the access board. So, the current VVSG with respect to interoperability only includes requirements for this audio jack for personal assistive technology and, in fact, the access board says they don’t really consider audio jacks to be personal assistive technology.

VVSG also has some requirements to avoid interference with hearing aids. One might view that as assistive technology. It doesn’t interconnect directly. That is when a voting station utilizes a telephone style handset or headset, it needs to provide a T-coil coupling for assistive hearing devices and no voting stations shall cause electromagnetic interference with the assistive hearing devices. Now if you want to broaden that to other kinds of personal assistive technology writing testable standards for this kind of interoperability is challenging. So if we want to go down that route we have to realize there are some issues. You need standard communication protocols, standard ports. You need compatible software and there is technical and feasibility issues for implementation and, of course,
security issues. So, I am going to open it up to discussion. I can answer questions and I also refer you to the white paper, The Discussion of EVSG Requirements for Personal Assistive Technology. That is in your packet which has some additional verbiage but basically I’ve summarized what its about.

MALE SPEAKER 38: Sharon, let me ask you other than headsets and audio jacks what kind of assistive technology are you thinking about?

MS. LASKOWSKI: For example, switch technology, puff and sip, being an example of that but there are a number of other different kinds. That’s pneumatic technology. There are other kinds of switch technology. So, that’s a good example of the interoperability that you would talk about because you are also not just getting output but you are also doing input to make selections from the DRE and the DRE has to be able to understand that particular switch technology and there are a number of different products. In order for us to research that we would, for example, do a workshop with people that know, with vendors who build switch technology so we would understand what is out there in the field and –
MR. CRAFT: And I think, Sharon that takes you to where this probably has to go. Because so much of this stuff is not standardized, there are no industry standards, for example, sip and puff device output. I think we are going to have to bring in personal assistive devices really on a case by case basis. I think we can all agree that the system shouldn’t be expected to allow you to vote with your eyeglasses on a video ballot although it provides you with an audio ballot and it shouldn’t conflict with hearing aids or it should work consistent with hearing aids. When we get into the Braille keyboard devices and we get into sip and puffs, I think we are going to have to bring those into the fold of assistive devices that are allowed really on a case by case basis.

MS. LASKOWSKI: There is also the question, yeah, if we do it, it has to be case by case. I also know it brings in a lot of issues for poll workers to manage because there is additional kinds of equipment they have never seen before maybe. So, there is troubleshooting that have to do with the polls is very difficult for the poll workers.

MR. CRAFT: I still fall back to the theory that a person in a chair who is running his chair on a sip and puff is going
to allow a poll worker to unplug his sip and puff device from his chair and plug it into a voting system. I just don’t think that’s ever going to happen.

MS. LASKOWSKI: Yeah, so there’s that other aspect. That makes it difficult to --. The privacy subcommittee did come up with a recommendation based on the analysis that we did. Whitney do you want to read that?

MS. QUESENBERRY: I’d be happy to. Its actually something we talked about and voted on as a subcommittee because this is a particularly thorny problem because there is no question that we would love to be able to allow any assistive technology that anybody has to make it as easy as possible for people to vote. On the other hand, I don’t think that its feasible to allow an open USB port on the side of a voting machine or any other trends.

The other problem that we came up with when we asked the access board for assistance in identifying standard interoperability connections for these the answer was that there weren’t any. There were not good industry standards within the assistive technology world that we could draw on. They have, I should note, offered to help us should we want to pursue this. So the recommendation that we came up with
as a subcommittee is that “the human factors and privacy
subcommittee of the TGDC recognizes that innovation to
improve accessibility to larger segments of the disabled
population should be encouraged and addressed in future
versions of the VVSG. However, at the present time, the
committee recommends that the VVSG require general
sufficiency and a closed self-contained system with limited
interoperability exceptions done on a case by case basis.
The committee also recommends that the EAC and NIST together
review the final draft carefully to ensure that the VVSG
technical language accurately represents the intention of
the requirements.” I think this is one where slight changes
in wording can change the meaning of the requirement
substantially and it needs to have careful technical review.

MS. LASKOWSKI: Also if Jim Elekes is on the phone
patiently listening we can put him on mike and if he wants
to make comments because he is also a member of the human
factors and privacy subcommittee. Jim.

MR. ELEKES: You have covered it all very thoroughly.

MS. LASKOWSKI: You’ve covered it all very well. I
didn’t know if this was anything the full committee wanted
to vote on. I know that we all got these giant packets of
material and while I presume you would rush to read our material first, that’s probably not quite entirely true. We did spend a fair amount of subcommittee and staff time on it.

DR. JEFFREY: Do I take that that’s a motion for the TGDC to vote on then?

MS. LASKOWSKI: Well, I was actually asking for some discussion on whether we ought to have such a motion or whether this is just simply something that should --. We didn’t know quite how to proceed from here.

MR. CRAFT: I this committee needs to away and read what you guys wrote.

MALE SPEAKER 39: Now, a couple of observations. One is I think this may be an example of an important issue that we don’t have a solution. I like the way you put it, Whitney, I think you identified the issue. I’m aware of some what I find to be fascinating research by Neal Scott at Stanford in this area but I don’t think that industry, the assistive technology industry is to the place where we can implement anything.

MS. LASKOWSKI: Actually some of Neal Scott’s work, additional work, (undecipherable) subcommittee has been
working on some of these futuristic interoperability standards and I do have a staff member working on that. They are definitely not ready for prime time yet but we are aware of those.

MALE SPEAKER 39: So maybe this is one of those, we highlight the issue and follow the development of technology.

MS. LASKOWSKI: Well, I think we do have to clarify in the VVSG though what do we really mean for the current version of the VVSG.

MS. QUESENBERRY: We look for it to be more precise which would the EAC like to adopt? We can make recommendations but ultimately they adopt the requirements.

MALE SPEAKER 40: I thought you recommendation was a good one. I support that. Also the concerns about security are real. I consider this a research area. Maybe there are ways to mitigate all of the security concerns with the sort of narrowly defined interface standard with optical coupling and everything else but that’s research.

MS. QUESENBERRY: Perhaps I could offer this as an action item for the committee is that if people would, in fact, take some time to think about this issue and we’ve got our discussion list and I know in response to J.R.’s motion
this will be near the top of one of my potential additions
to the NIST workload.

MS. LASKOWSKI: I did have that other list of issues
which are nowhere near the scope of this one if you want me
to discuss any of those further in the next two or three
minutes, I can do so.

DR. JEFFREY: I think what I would like to do is make
it a little bit more generic right now and, again, have this
part of the discussion if someone wants to raise a specific
question on any of those.

So, at this point NIST believes again the preceding
preliminary report of technical support on human factors and
privacy subcommittee preliminary reports for the next VVSG
iteration responds to the TGDC resolutions, the relevant ones.
So, unless there is supplemental directions or corrections
or questions, the technical support and related work product
will continue to be developed consistent with this
preliminary report. At this point I would like to open it
up if there is a specific questions, comments, further
directions or corrections to this subcommittee.

MR. RIVEST: I’ve got a question. This is Ron Rivest.
Maybe we have covered this before but I just want to ask,
are there other aspects of the standard that deal with a voter
who discovers that the equipment is not working properly?
Do we have anything if the toner on the printer is not work
on the VPAT and so on? There is a range of interactions that
happen on machines.

MS. QUESENBERY: This isn’t something that we’ve
covered but – it isn’t something that human factors and
privacy has covered but I do think that one of the things
that I’m beginning to see as a trend is that as we progress
in our work overall as a committee and the three subcommittees
we are seeing more places where we need a little more
interconnection between the subcommittees because that seems
like an intersection between a core requirement – how do you
manage equipment failure and some polling place requirements
– how do you help the polling place workers manage equipment
failure? What is the most usable way for the voter to interact
with that? So, we’ve sort of got, you know, now that we have
a bit of a baseline, we are beginning to see things come
together like PAT having security implications and we need
to – maybe one solution would be to rather than kind of work
completely on separate tracks would be to take periods of
time where we look at some of those issues specifically and
do some cross committee work on them to be able to resolve them. I think that would fit well with our modular chunks approach as well.

MALE SPEAKER 41: I want to just comment specifically on the audio quality issue that you raised. I think there is some new work that is just reaching fruition and we are probably at a place where we can harvest some of that and put some good audio quality metrics on audio --.

MS. LASKOWSKI: Well, what we had in mind is and actually you can consult with Chris Vanderheim on some of this. Synthesized speech is much better than it was and we think there are three qualities here and that speech needs to be clear and intelligible and there’s ways to measure that. That you are able to control the rate of speech and that the candidates’ names are reproduced as the candidate wishes. Right now in the VVSG the requirement prefers a human recorded speech over synthesized speech and we probably think its better to use a quality metrics.

MS. QUESENBERY: Can I just share a little bit of what happened at the standards committee since we are having a little side bar here.

At the standards committee meeting we heard from a lot
of voting officials who said please don’t tell us how to do it. There are places where synthesized speech would never be able to be coded well enough to handle the pronunciation of names. There are places where they might work find for them. What they asked for was for quality, you know, what’s the result that we want and could we please focus on that rather than dictating technology because the minute we dictate technology, it eliminates entire systems from their consideration when they may have a way of solving the problem.

MR. CRAFT: Let me say there is some excellent research being done about three corridors from here for Homeland Defense and the particular audio needs and how to measure for first responders. That’s relatively new work. There is also some research that is just going to be wrapped up in the next couple of months out at Gallaudet University on a particular needs for people with hearing loss. I think some of this we can put better metrics on than we may have been able to maybe even six months ago.

MS. QUESENBERRY: And even more operationally, I think some of the work that’s being done at the Trace Center in Wisconsin which is a (undecipherable) rehabilitation, research center. They have been dealing with audio for
disabilities for a long, long time and have some good metrics as well.

DR. JEFFREY: Are there any additional comments, questions? Do I hear a motion to accept this preliminary report?

FEMALE SPEAKER 14: Second.

DR. JEFFREY: Okay. There is a motion to adopt and its been seconded to a preliminary report. Is there any additional discussion? Okay with that I will move for a unanimous consent. Any objection to unanimous consent? So moved. Thank you.

MS. LASKOWSKI: Thank you.

DR. JEFFREY: With that, I would like to take a quick fifteen minute break. Please do be back here by three o’clock so that we can try to stay on schedule. I appreciate it.

Thanks.

(END OF AUDIOTAPE 4, SIDE B)

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(START OF AUDIOTAPE 5, SIDE A)

MR. HASTINGS: --- that being integrated into the next version. The current activity that we have ongoing and we’ll take a little about some activities targeted for initial
completion in January of 06 as well as April of 06 and beyond. 
So, we continue to look at the resolutions and make sure 
that we follow the spirit of those resolutions as we develop 
the security requirements. We also continue to look at the 
VSS 2002 as well as the work that I-EEE has done as well as, 
now that we have the VVSG, we use that as well and any other 
sources. As we identify new requirements that are needed 
we will develop those and we are going to use the results 
from the threat analysis work that’s going to be taking place 
here shortly as input to those requirements. One of the 
things that we are going to try and do is to consolidate a 
general security requirements such as cryptography into a 
general comprehensive security section and I’ll talk about 
that a little bit more in the next slide. We will look at 
specific security requirements that are needed and other 
sections such as the casting section and the counting and 
reporting section.

Just to recap some of the stuff that we delivered in 
April. We did the software distribution requirements that 
were to initially address Resolution 1505 - Software 
Distribution. What was imbedded in software distribution 
were general cryptographic requirements and we want to move
those into a general cryptographic section within the
security section to that other parts of the standard can then
point to those if they need to use cryptography.

Validation set up requirements were developed to
initially address Resolution 1605 - Set Up Validation. What
we are going to do with that is we are going to take those
requirements and integrate those into a larger more
comprehensive system integrity management section.

We delivered some requirements on wireless to address
Resolution 3505. What we are going to do is we are going
to take those requirements and put those into a more
comprehensive overarching communications section that
includes wireless technology as well as wired technology.

We also developed independent dual verification
requirements to address Resolution 1205 - Voter Verifiability
(sic) 1 that included requirements for VVPAT and details on
that work is going to be discussed by John Wack in the next
presentation.

Some of our current activities - we are going to hold
a threat analysis workshop next Friday, October 7th in
Gaithersburg to address the possibility of different key
threats such as Trojan Horses and software to see how
plausible they are and hopefully get some priority on those
so that as we develop requirements we can say these
requirements are to mitigate the risk by threat acts. Like
the last bullet says, those results will be fed into
developmental security requirements.

We are also in the process of researching and developing
a white paper to address Resolution 1705 on testing and that’s
open-ended testing as opposed to just a check list of things
that the testing laboratories would look at. Hopefully we
will have that completed, a draft of that completed in January
of 06 and those results will be incorporated into the testing
standard section.

We are also starting to cross pollinate with the other
subcommittees. Core requirements and testing subcommittees
have asked us to look into creating an access control model
as well as developing some requirements for security related
documentation as well as looking at the security requirement
for transmission of results. Just a note on this we have
also had some interaction with the human factors and
performance committee in the work related to VVPAT.

So, some of the sections that we are looking at to
initially delivering in January of 2006, we are trying to
start with some core security requirements that can then be
built upon so that we have a nice foundation. One of the
sections is cryptography, another section is software
distribution and installation, access control and system and
event logging.

Further out we are going to look at physical security
and communications, security requirements in the April 06
time frame and in July 06 time frame we are looking at system
integrity management section and hardware security sections.
In the October time frame we are looking at the IDV profile
to be completed and then in January of 07 the threat analysis,
a comprehensive threat analysis appendix to be added. As
always, these dates are subject to change. That’s really
all I have to say on the subject.

DR. JEFFREY: Any questions, comments before John
talks.

MALE SPEAKER 42: I just have a couple of questions
being a new member on the committee. With our security
standards in 2002 or is this a whole new area that’s being
developed?

MR. HASTINGS: There was security standards in 2002
in what we delivered in VVSG1. The specific areas of set
up validation, software distribution, those types of things. This is going to just kind of extend and enhance some of those as well as add some additional requirements.

MALE SPEAKER 42: Do these standards apply to all types of equipment or is it just DRE or does it optical scan as well as other new emergent technologies or is it just a DRE source code issue that we are dealing with?

MR. HASTINGS: I think that that’s one of those issues that would be looked at in terms of the profiles that we were discussing earlier. What requirements would apply to a given system based on its profile. I guess, maybe, to answer your question, I’m looking at this as requirements for not just DRE systems. Maybe I’m talking way too much here.

MALE SPEAKER 42: Then the other question I had is with regard to DRE equipment, it is my understanding that some states have networked their DRE equipment so it is subject to maybe potential hacking or viruses. Others are all stand alone equipment, each is an independent unit. Do these apply to the independent units or does it also apply to a networking of equipment?

MR. HASTINGS: I think it would apply to both.

MALE SPEAKER 42: To both.
MR. HASTINGS: Yeah.

MALE SPEAKER 42: Thank you.

DR. JEFFREY: Any other questions?

MALE SPEAKER 43: A couple of quick questions. On the threat analysis workshop you are going to do, are you basically going in the direction of a protection profile and the common criteria type evaluation or is this going to be sort of different from that?

MR. HASTINGS: Okay, so when you ask about common criteria are you talking about like the common, the protection profile part where it talks about the threat for that? The objective of the threat analysis workshop isn’t to develop protection profiles if that is your question.

MALE SPEAKER 43: That was. The other question I had is, where a security risk could have an equipment solution or alternatively have an administrative procedural solution how are you going to balance that kind of assessment?

MR. HASTINGS: I think that that’s, once again, we will go back to the profiles on what are the capabilities in that system. If the capability isn’t built into that system, you will have to have some type of best practices that guide you on how to overcome that.
DR. JEFFREY: Any other comments or questions? Thank you very much Nelson. John.

MR. WACK: Hi, folks, if I can just take a second to find my presentation here. Oh, here it is. I apologize for that.

Well, if I had my druthers I would go through these slides just that quickly. Okay, I’m here to, I guess, kind of wrap it up and talk about independent dual verification which I learned at the break some people have some issues with. That’s sort of an understatement. Some people actually like it. I’m just going to talk a little bit about, you know, kind of a review of the concepts, how it looks in the EAC’s version of the VVSG, some research issues, talk a little bit about the State of Maryland study and some issues and next steps.

Okay, IDV, independent Dual Verification. It is getting back to David Flater’s talk a profile, it is a profile of types of voting systems and in essence a voting system. For example, a DRE that allows one to vote and records and electronic record. It produces a second record. It is possible for a voter to look at that record and verify that it is correct. There is a commitment on the part of the voting system to a different type of media that the voting system...
therefore cannot change. It is a record that would be very
difficult to change and you end up with two different types
of records, hopeful useful in recount comparisons.

VVPAT is really one example. It is really an
instantiation of IDV. Why is it important? The first line
there I say the second record is essential. I probably would
say the second record is a good idea for meaningful audits
and recounts. You can get meaningful audits other ways but
it’s a good idea to have this second record. From a security
point of view the main issue here is the voting systems are
computers and computers have problems. They don’t always
work. Voting system procedures vary widely across the United
States and just for basic integrity reasons, it’s a good idea
to have this second record.

How is it handled in the VVSG? Well, we talked a little
bit, well, actually, no, we didn’t, about the VVPAT
requirements that are in the VVSG so that’s an example of
an IDV system. Then in Appendix B we’ve got a larger
discussion. We’ve got core requirements for IDV. There
aren’t very many but then we go into different types of IDV
systems, crypto, optical scan, modified optical scan, witness
devices, split process and I’ll talk a little bit about those
and please interrupt me if you have questions.

IDV and the marketplace. At the time we were developing these requirements we were also noticing that the marketplace was responding with some different types of equipment and therefore we thought that it was a good idea to get requirements out there sooner rather than later. So, actually in the VVSG right now they are what we call as characteristics not firm requirements. Its an informative section. Right now these aren’t totally accurate figures. I came up with them about two weeks ago. It appears that we have two or possibly more witness systems on the market right now. At least four VVPAT systems and a number under development, two different types of VVPAT systems. At least one ballot marking op-scan system that is kind of a split process system and one or possibly more crypto systems available. Now, they don’t fit every single characteristic or requirement but they are in the ball park and they are going in the right direction.

Some issues with it. The first one, I think, is one familiar to all of you who have looked at the VVPAT requirements. That is, how usable is the second record? Can you easily use it to compare against the first record? That’s a big issue and witness systems, for example, like
a witness system that takes essentially a screen snapshot of the verification screen on a DRE. Is that going to be in a format that is easily usable to an election official, to an auditor to compare against the electronic records? Things of that sort.

So, really, I got to the second bullet there, Usability for both voters and election officials. A witness system, for example, you could probably say that’s a little bit more usable to the voter because the voter really doesn’t get involved in that. That’s basically a snapshot taken while the voter is voting and doesn’t have to do anything extra. But, as in VVPAT, you know, of course, there is this other paper record that you look at and so you do have some different voter behavior there.

The usability for election officials though has to be studied because its really not worth building these systems, I think, if they are difficult to audit. It sort of defeats the whole purpose. That’s a huge part of it. There are some issues that we already know about, accessibility, multiple representations. Essentially paper is, you know, great in many ways but its just not very accessible and the same issue is going to come up with different types of media.
Interoperability of record formats to facilitate third party audits. If we are going to produce multiple records it eventually becomes important that the records be produced in standard ways using standard mechanisms so that commercial, off the shelf software can actually read it and do some analysis and things of that sort. We think that that’s another issue that needs more study and more work.

The State of Maryland came along and they call IDV, IV, independent verification. It's basically the same thing. Maryland basically purchased a number of DREs and then undertook a study to determine what types of add on equipment could provide this extra record. This other independent verification. So they are currently performing a study right now taking a look at, I think, five or possibly six, other technologies focusing on the usability of the record formats. Security issues that’s another thing that they are really wanting to take a look at and that is, is it really worth it in a sense, is the voting system and is the election going to be more secure if you actually, you know, go to this extra step with having independent verification? That kind of ties into this threat analysis workshop that we are going to be having.
So, we put out the VVPAT requirements and we’ve been hearing from the EAC that it would be a good idea to get out requirements for other types of systems that produce this independently verified record that aren’t necessarily VVPAT. I suspect that we will be looking at these other technologies more closely in the near future and, again, you know, I have listed a couple of other bullets that I really kind of gone over, issues with accessibility and things of that sort.

The threat analysis workshop, I think, will be very useful in the IDV area and I’m hoping, I’ll just put in an advertisement for it right now. If anybody can attend I think it’s a good thing. I did get the recent attendance figures and they are about eighty registered. We originally anticipated about ten or I anticipated about ten. So, it could be pretty lively and pretty interesting. With that are there any questions I can answer or comments or things that I glossed over or yeas or nays?

DR. JEFFREY: Any comments or questions? With that let me read the similar statement and get it out of the way.

NIST believes the preceding preliminary report of technical support titled Security and Transparency Subcommittee Preliminary reports for the next VVSG iterations responds
to the relevant TGDC resolution. Unless there are supplemental directions or corrections the technical support related work product will continue to be developed consistent with this preliminary report. So, are there any questions, further directions or corrections that anybody wants to add to this? If not, do I hear a motion to adopt the preliminary report?

MALE SPEAKER 44: So moved.

DR. JEFFREY: Is there a second?

MALE SPEAKER 45: Second.

DR. JEFFREY: Is there any discussion? Okay, I’m feeling like a broken record. Without discussion on this I’ll go for a unanimous consent unless there is an objection. Okay. So, Phil, you got it? So, its been adopted. Thank you.

At this point I am going to ask Ms. Carol Paquette of the EAC to present her report on internet voting.

MS. PAQUETTE: Thank you. My NIST colleagues have set a very high standard of completing remarks within the allotted time frame so I will try to continue in that vein. Requirements for internet voting is a new requirement that EAC wishes to put on the table. Last year’s National
Defense Authorization Act, I would draw your attention to the last sentence in each of these two paragraphs that the Department of Defense should be doing, the gist is that the Department of Defense should be doing another electronic internet voting demonstration project but not until the EAC notifies the Secretary of Defense that we have guidelines and that we will assist in the project.

The second paragraph it says that perhaps the Defense Department might like to come forward with a little funding for this activity. We have had, the Commission has had an inquiry from the Department of Defense regarding our proposed time lines for developing said guidelines and we have responded that we will be coordinating with NIST and get back to them. So, here we are to talk about this subject.

I want to talk a little bit about what’s different about internet voting and make a few preliminary comments of things that you will need to consider in setting standards or guidelines for internet voting. I’ve had a little bit of experience in this realm having been the project manager for both of the Department of Defense internet projects and we needed to come up with testable requirements in order to get systems certified. So, here are some of the things that we
learned. This is extremely broad brush, very simplistic but
we have a very short period of time and I basically just want
to throw it out for consideration and discussion. The reason
I am using this title - Degrees of Separation - is that in
internet voting, I think one of the major differences is that
the voting process becomes much more distributed. When you
look at poll site voting everything is co-located. The voter,
the voting equipment, the ballot, the election official,
everybody is physically within the same space. So to go back
to some of David Flater’s comments, you have some questions
or some interactions between what the process does, meaning
the people and the procedures and what the system does.

So if you just go down this listing here, we also like
to start with the voter registers to vote. We should never
loose site of that fact. If the voter isn’t registered all
the rest of this discussion is moot. The voter appears in
person to vote at their polling place. The poll worker looks
at the poll book and says, yes, we have you on the books.
You are eligible to vote and the poll worker ensures that
the voter gets the correct ballot. In many instances that’s
a no brainer. There is only one ballot available at the
polling place so you are directed to the voting device
whatever that might be and you mark your ballot in whatever manner, electronically, op-scan, whatever, and, I’m just using this generic ballot place and the ballot box for discussion purposes here. Okay, the voter has now voted he’s done with the ballot. The ballot is in the hands and under the control of the election official.

Okay, let’s look at another model where the process starts to get a little distributed and that’s absentee by mail voting. Again, the voter registers to vote. They request an absentee ballot. That could be in person. It could be by mail. It depends on the procedures. You still have the election official looking at the voter registration data base to say this person is eligible to vote. They also figure out what ballot gets sent to the voter and they send that ballot to the voter. So, again, all the key steps are in the hands of a person who may be aided in some means by an electronic system. The voter makes their ballot selection. They have an extra step in this case in that they have to sign the ballot as a verification step and they return the ballot. When the ballot is received there is an extra step for the election official in that the signature has to be verified. Assuming that that is done satisfactorily, another step in that the
voter identification has to be separated from the ballot and the ballots placed in the ballot box. Again, very much a human mediated process. All the important, or most of the important steps are under the control of the election official. However, the voter is no longer in the presence of the election official and the ballot marking process is no longer within the control and supervision of the election official.

So let's go on to internet voting. Internet voting, depending on how it is developed, could be almost entirely a software mediated process. Let's just talk through some of the steps here. The voter registers to vote. They request a ballot electronically. The identity and eligibility could be checked by software rather than by an election official. The software could be collecting the correct ballots and that would require some interaction with the voter registration data base, both for the eligibility check and to determine the ballot style. The voter makes their ballot selections. They still have to give some indication of what their identity is. So in this case they are signing electronically with a digital signature or PIN, some other code as opposed to a wet signature and they return it. Similar steps to the absentee voting, the authentication, the
identification has to be verified again. Its probably going to be done by software and the voter identification is removed and the ballot is put in the ballot box.

So, where does this lead us in terms of thinking about standards for internet voting systems? We have a number of new voting process elements. I’m not trying to say this is a one hundred percent list but I think these are some significant new factors to consider. We have the identification and authentication of the voter by the voting system. Its not done by the election official. Identification means my name is Carol Paquette and authentication is I have some means of proving to you that I am the same Carol Paquette that you, election official, have on your voter registration data base.

Another little interesting wrinkle which is the authentication of the voting system by the voter. We heard about spoofing and other things going on on the internet so the voter also wants to make sure that they are connected to the right system and they are not off on some bogus web site where their ballots are going to be lost. Then you have the task of matching the voter to the correct ballot style. Again, not different from the other processes but if its
being done by software some different challenges. The task of ensuring ballot integrity. We now have a ballot that is moving around on the internet which is an inherently risky situation.

We have something new in communications. Security availability, reliability to communication links within the voting process. What I mean by that is the ballot gets sent to the voter electronically over the internet. The voter sends it back again over the internet. So the vote doesn’t get into the ballot box. It is not into the election official’s control until its returned. In contrast to some of the discussions that you’ve had about the use of communications, its been pretty much at the end of the process and sending around total information or account information. This is actually in the process of getting the ballot, voting the ballot and returning the ballot.

And then we have the question of security and reliability of the voting device and the question of what is the voting device? It could be the voter’s P.C. It could be a kiosk which is sort of a standard term for some type of a specialized computer system that might be under the control of the election official or it might be under the control of some
official. Again, depending on how it is established. There could be, obviously, many permutations and combinations of how internet voting systems are put together. I think all these comments here, to my mind at least, are very closely related to some of the comments that David Flater was making when he was trying to distinguish between what are the things that the voting system does meaning the people and the processes versus what are the things that the, I’m sorry, the things that the voting process does versus the things that the voting system does meaning the hardware and software. Again, we have to look at these elements in internet voting. So we need to define what we mean by an internet voting system and some of the salient questions I think are, again, very similar to some of those that David Flater was raising.

What are the system boundaries? What are the interfaces to election management? What are the functions that the system performs versus what the process performs? As I was just indicating what is the voting device and who controls it?

I have two examples in terms of very different ways in which voting systems can be done and again, I have to thank Mr. Flater for giving me a wonderful lead in line. He said something to the effect of we can only dream of the day when
a voting system will prevent the voters from casting more than one ballot. Well, let me say David, I can’t exactly see you out there in the audience, it’s actually been done twice. Oh, there you are, I’m too short. Once in a system that was actually used in a presidential election. So it can be done.

Voting over the internet was the DOD project for 2000. I’m not going to bore you with all this. The main point I wanted to make here is that this system was highly distributed. The servers were all in the hands of the election officials. The central processor in there with the Federal Voting Assistance Program was really just a communications router and the ballots used in this case were stored as objects. I know the computer scientists in the audience will know what I mean by that. I haven’t really come up with a good term for that for the layperson but it means basically, you have an electronic thing which is the ballot. You can sort of point to it like a file in a data base. That’s one way of doing it. Another way of doing it was the project in 2004. Very different architecture, highly centralized, a set of centralized servers, accessed by election officials remotely. The ballots were not objects. The ballots were built on
the fly from ballot definitions stored in the data base and matched to the voter registration records to determine the ballot style for the voter. Many other different kinds of features. I don’t want to dwell on this because I just wanted to give you some examples.

That concludes my presentation and I will open to questions and discussions. Thank you.

DR. JEFFREY: Thank you very much. Any questions?

MR. RIVEST: I have a comment and a question. I guess the first comment is, so this has been proposed in the DOD legislation. It wasn’t clear what activity the AC or TGDC maybe would be expected to undertake as part of this.

MS. PAQUETTE: Well, as I indicated, the DOD has communicated to the commission and asked what is the time line for developing these standards so that they can look at their time line for conducting said demonstrations. I would have to toss the question over to NIST in terms of what is the relationship of the TGDC to this tasking. I don’t really have the answer to that question.

MR. RIVEST: So if there are standards to be developed and I think that the presumption when one develops a standard is that the goal is achievable. I personally don’t
believe that we have the security technology to make secure internet voting yet. That’s at least a decade off and trying to develop standards at this stage is really premature and something that I would say is ill advised in spite of the desired need to support our troops voting and stuff like that. I think we need to look at a lot of different approaches. Internet voting may not be the best just because of the security issues. So, I think we need to have a discussion about security of internet voting and what to do in spite of the request to try to supply that. I think developing the standard has the presumption that one can do so securely. I don’t think we’re there yet.

MS. PAQUETTE: Okay.

MR. CRAFT: Number one I think it’s a fundamental mistake to categorize something as internet voting. It is a networked or a distributed voting system and whether or not you are using the internet is kind of irrelevant.

Second point is I think there is a lot that we can do to help our overseas military and embassy personnel vote easier and I think the solution that’s readily available is using a kiosk. The biggest problem right now with internet voting is to secure the client in the hands of the voter and
a kiosk allows you to do that.

DR. JEFFREY: Any other questions or comments?

MALE SPEAKER 46: Carol, there was some documentation provided to NIST early on in the process here that came from the Oasis Election Voter Services Committee that had, in fact, examples of on-line voting mechanism that were being done in Europe. Has any information been made available to you or your team?

MS. PAQUETTE: We are familiar with the Oasis work, yes.

MALE SPEAKER 46: There were some references to examples of where work is being done in terms of actual systems being, on-line voting occurring and I didn’t know whether or not you had the advantage of analysis or feedback from that.

MS. PAQUETTE: Well, we have not talked to the Oasis folks probably in more than a year. That would certainly merit some start up of that conversation again. I think part of the reason we are presenting this here is that the legislation specifically mentioned NIST by name in addition to the EAC so I think we need to get some resolution of is this a task that will be take on or not.
DR. JEFFREY: I believe that was authorization not appropriation.

MS. PAQUETTE: That is correct.

DR. JEFFREY: Also was encouraged, not mandated. So, with those two caveats.

MS. PAQUETTE: I understand but there has been follow up inquiries.

DR. JEFFREY: Any other comments or questions? Carol thank you very much. It was very good.

We now move into the next phase of this and given that this group has not been bashful, this phase of the introduction of resolutions and discussions by the TGDC. So at this time I will open up the floor for anyone to add any comments or propose any additional resolutions.

Is everyone happy, satisfied? Okay. Going once, twice. There were a number of resolutions that were adopted today and obviously those are now going to provide direction and policy to the NIST staff and to the subcommittees. I think there is a prioritization process that you go through to make sure how it fits into all of the other resolutions. I think also that some of the things that J.R. asked for in terms of a matrix that will help clarify exactly how all
these pieces fit together.

So, any other questions or clarifications on this? Okay. Well, what I would like to do is set the stage for the next meeting. I believe that everybody has been handed a sheet with some potential dates. I believe its appropriate that probably some time in the spring, maybe March time frame is the appropriate time for us to get together again and to check on the progress of where things are going. What I would suggest since I don’t expect everyone to have their calendars memorized that far in advance, is to think about what the appropriate dates would be given that sheet and to e-mail them back to Alan Eustis who will then coordinate all the appropriate dates and also check with the EAC to make sure that there aren’t any conflicting meetings going on during those dates that might cause some conflicts in schedules. So, any questions on the schedule, please e-mail back to Alan Eustis is probably the easiest unless you know today in which case just hand in the sheet today.

Well, one, I would very much like to thank again the EAC commissioners who came here and participated. I would also like to thank the EAC staff, the executive director for being here and again, providing very valuable insights and
dialogues to us. Obviously, I would very much like to thank the NIST staff who make me proud for many reasons. Again, thank you for the excellent work and the excellent presentations that you did today. I would very much like to thank my fellow TGDC members for again the amount of time and effort I know is going into trying to make this system as good as possible.

Along those lines, if I could ask a favor of my TGDC members that if there is comment to think about it in terms of lessons learned and best practices for ourselves if there are any suggestions that you might have for me in terms of format changes to how we present the data or anything else, please contact me, either by phone or by e-mail and again, this needs to be as useful a process as it can be in terms of information exchange and a form upon which you can have a discussion and debate. So, if you have any suggestions and best practices I’m all ears on that.

With that is there any other comments that anyone would like to make?

MALE SPEAKER 48: Welcome the committee and you did an excellent job.

DR. JEFFREY: Thank you very much. With that I adjourn
this meeting of the Technical Guidelines Development Committee and I look forward to the sixth plenary session. Thank you very much.

MALE SPEAKER 49: Do you need a motion to adjourn or just automatically adjourn?

DR. JEFFREY: Do I need a motion to adjourn? No, okay. Unanimous consent.

(END OF AUDIOTAPE 5, SIDE B)
CERTIFICATE OF AGENCY

I, Carol J. Schwartz, President of Carol J. Thomas Stenotype Reporting Services, Inc., do hereby certify we were authorized to transcribe the submitted cassette tapes, and that thereafter these proceedings were transcribed under our supervision, and I further certify that the forgoing transcription contains a full, true and correct transcription of the cassettes furnished, to the best of our ability.

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PRESIDENT