**Meeting Minutes (Final)**
**Technical Guidelines Development Committee (TGDC) Meeting**
**September 29, 2005**
**National Institute of Standards and Technology (NIST)**
**Boulder, Colorado 80305**

**Members in Attendance:**

Dr. William Jeffrey – Chair
H. Stephen Berger
Paul Craft
James Elekes (By Conference Call)
Patrick Gannon
J.R. Harding
Alice Miller (By Conference Call)
Helen Purcell
Whitney Quesenbery
Ronald Rivest
Sharon Turner-Buie

**Committee Support Staff:**

Phil Greene, General Counsel Office, Department of Commerce
Mark Skall, Chief, Software Diagnostics and Conformance Testing, ITL, NIST
Barbara Guttman, Software Diagnostics and Conformance Testing, ITL, NIST
John Wack, Software Diagnostics and Conformance Testing (ITL), NIST
Alan Goldfine, Software Diagnostics and Conformance Testing (ITL), NIST
David Flater, Software Diagnostics and Conformance Testing (ITL), NIST
Wendy Cannon, Software Diagnostics and Conformance Testing (ITL), NIST
Lucy Salah, Software Diagnostics and Conformance Testing, ITL, NIST
Allan Eustis, Information Technology Laboratory (ITL), NIST
Sharon Laskowski, Information Technology Laboratory (ITL), NIST
John Cugini, Information Technology Laboratory (ITL), NIST
Nelson Hastings, Information Technology Laboratory (ITL), NIST

**September 29, 2005: Morning Session # 1**

Dr. William Jeffrey, TGDC Chair, called the fifth plenary session of the Technical Guidelines Development Committee to order at 9:00 a.m. He introduced himself as the Director of the National Institute of Standards and Technology and Chair of the Technical Guidelines Development Committee.

After the pledge of allegiance, the Chair recognized Mr. Phil Greene as the TGDC Parliamentarian and requested that he determine if a quorum of the Committee was present. Mr. Greene first noted and corrected a typographical error in the parliamentarian's letter to the Committee. Mr. Greene then called the roll (See Table 1.).

Twelve TGDC members answered "present." Mr. Greene notified the Chair that a quorum (simple majority) of the Committee was present either in person or via conference call connection. (Note: There were periodic audio and communications malfunctions during the course of the Boulder plenary sessions. During those times, the Committee members participating remotely were often able to listen to the proceedings and vote via teleconference and Internet connections. In several instances, determination of a quorum and resolution of vote totals were delayed until communication with Committee members was reestablished. There are instances in the transcription where it was difficult to determine the name of the TGDC member offering a motion or making a comment.)

Dr. Jeffrey recognized U.S. Election Assistance Commissioner Donetta Davidson, a former member of the Committee. He thanked her for the invitation to meet in her home state of Colorado, where she had served the community in numerous state and local positions including Secretary of State.

The Chair expressed his appreciation to the staff of the Boulder NIST facility for their hospitality and assistance in making the public meeting here possible. He also expressed his appreciation to the TGDC members for arranging their busy schedules to participate in this plenary session. "This takes a lot of time and a lot of effort. These are important issues and I really do appreciate, and I think everybody appreciates, the value of the time and effort you are putting into the recommendations to the EAC. So, thank you personally and also for the country."

Dr. Jeffrey noted that he had been recently sworn in as Director of NIST in July 2005. He thanked Dr. Hratch Semerjian who served as both Acting Director of NIST and TGDC Chair for the three previous plenary meetings, making possible the delivery of initial recommendations for voluntary voting systems standards to the Election Assistance Commission (EAC) in the nine months required by the Help America Vote Act (HAVA). "He did an excellent job of getting to where we are today. I look forward to hopefully filling his shoes and continuing the progress that he made."

The Chair welcomed a second new member to the TGDC, the Honorable John Gale, Secretary of State for Nebraska, who succeeds Commissioner Donetta Davidson as the Committee representative of the EAC's Standards Board. He then offered Secretary Gale the opportunity to make introductory remarks.

Secretary Gale thanked the Chair. "It is an honor to be serving on this Committee. I am looking forward to getting to know all of you better and to becoming more acquainted with the tremendous staff assistants that you have. I am Chief Election Officer for the State of Nebraska, Secretary of State since December 2000. I am very committed to election reform issues that we are addressing to bring public confidence back in our election process."

The Chair recognized the Commissioners and staff of the EAC in attendance today: Commissioners Hillman, DeGregorio, and Davidson; Executive Director Wilkey and

Special Projects Manager Paquette. He noted that Commissioner Martinez, not in attendance, had submitted written remarks which would be read into the record at a later time.

Dr. Jeffrey entertained a motion to adopt the September 29, 2005, meeting agenda for the Technical Guidelines Development Committee located in the Committee members' binders and distributed to the public in attendance. A motion was made by Dr. Harding and seconded by Ms. Quesenbery. Hearing no questions or discussion, the Chair requested a roll call vote. Mr. Green called the roll. The meeting agenda as published was adopted by a vote of 11 yes, 0 no.

The Chair then entertained a motion to approve the minutes of the April 20-21, 2005, plenary meeting of the Technical Guidelines Development Committee provided in the Committee members' binders and as public handouts. A motion was made and seconded. Mr. Green called the roll. The minutes were approved 10 yes, 1 Abstaining.

As a brief review for the public in attendance and viewing the web cast, Dr. Jeffrey summarized the sections of Public Law 107-252, the Help America Vote Act (HAVA) establishing the Technical Guidelines Development Committee and its charter. He noted that 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 voluntary voting system 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 2005. In the interim, the 2002 Voting Systems Standards adopted by the Federal Election Commission served as the first set of voluntary voting systems guidelines under HAVA. Since the last meeting of the TDGC in April 2005, the NIST staff, in coordination with the three working subcommittees of the TDGC, has 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, Dr. Jeffrey noted that the latest, revised Version of Robert's Rules of Order was adopted on July 9, 2004, to govern Technical Guidelines Development Committee and committee proceedings. He called on Mr. Greene to review the logistics of this fifth meeting of the TGDC.

Mr. Greene thanked the chair. Mr. Greene then reviewed the parliamentarian's memo describing the logistics for this meeting. (The memo was available in advance to the public and Committee.) He noted the review and approval process will be similar to that undertaken at previous TGDC meetings. NIST staff will provide a presentation followed by discussion and suggested supplementary instructions. "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."

The Chair thanked Mr. Greene. Dr. Jeffrey remarked that the agenda for the plenary meeting was ambitious. "Specifically, as a Committee, we will review, approve and, where appropriate, provide supplemental direction to NIST scientists."

Dr Jeffrey noted that the time required to complete the plenary agenda items means that the Committee cannot take public comment at this meeting. However, there continue to be opportunities for the public to comment on all relevant issues. Comments and position statements should be sent to voting@nist.gov, where they will be posted on the http://vote.nist.gov web site. The comments received to date have been posted and reviewed by NIST staff and TGDC members.

Dr. Jeffrey then invited EAC Chair Hillman and her fellow Commissioners to address the Committee. "We appreciate the Commissioners' offer to address the TDGC at this meeting, and we welcome their remarks."

Commissioner Hillman thanked Dr Jeffrey and congratulated him on his recent appointment and confirmation as Director of NIST. She congratulated the Committee members on their "fantastic work" over the last thirteen months. She then highlighted the challenges ahead.

"The Election Assistance Commission, in partnership with the Technical Guidelines Development Committee, has an awesome task ahead 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 is a formal process that has to be invoked to do careful study and development of the guidelines. Sometimes that process does not fit within the time lines of election dates. In our case, we have election days every other year that must be adhered to, including primary dates leading up to general election dates. So, it is commendable that the TGDC was able to produce the guidelines that are currently out for public comment in nine months time."

Commissioner Hillman explained that the EAC had expended all available resources to hold meetings across the country to obtain public comment on the guidelines. "We have held hearings in New York, California, and here in Colorado so that we could receive testimony. At our public meeting on Tuesday of this week (September 27, 2005), we were informed that as of that date, over four hundred comments had been received. We would expect that a significant number of comments will come in this week before the deadline. We have been encouraging people to do that, especially the vendors."

Looking to the future, Commissioner Hillman indicated that the EAC has been considering guideline items that will need further review. "We really are trying to figure out this balance between producing future guidelines in a 'timely fashion' and also taking

the time necessary to do a careful review and study of the components of the next guidelines." Commissioner Hillman noted a need to balance the three or four critical deliverables and deliverable dates identified by NIST as future work for the TGDC "against the needs of the election officials across the country by providing this information in a way that does not cause undue concern. Election officials need to feel that they have settled into the equipment that they have chosen and tested, and that they have trained their staff and poll workers on how to use that equipment."

Commissioner Hillman expressed the concerns of state and local election officials that guidelines issued in 2007 could alter their budgets and election planning. "However, as we did with this set of guidelines, I am reasonably sure that we will produce future iterations in a way that will be useful and that will offer the protection and assurances that the voters need. When I step back and think, it is indeed an awesome task in which we are involved. We are setting standards for voting systems that not only will address the technical components, including guidelines for the vendors who produce the equipment and standards for the EAC-certified laboratories recommended by NIST that will test the equipment, but also, at the end of the day, that will provide an assurance to the voting public that the election systems on which they will be voting offer the kind of protection and assurance that they deserve as voters."

In conclusion, Commissioner Hillman offered congratulations to the TGDC "on a fantastic job" and expressed appreciation on behalf of her EAC colleagues. "We look forward to working with you over the next, over the years. Thank you."

Commissioner Hillman, EAC Chairperson for 2005, introduced her fellow Commissioner, Vice Chairman DeGregorio. He thanked the Chair. "I have had the splendid opportunity to be here for the creation of the TGDC. I was the Federal Officer for the TGDC under the Federal Advisory Committee Act and was present for every meeting. I followed your progress very closely."

Commissioner DeGregorio expressed his appreciation for the work of NIST in support of the TGDC and the EAC since 2004. He indicated that he looked forward to the leadership of Dr. Jeffrey and he welcomed Secretary of State John Gale. "It is a pleasure to see you on the TGDC taking the place of my esteemed colleague Donetta Davidson. I know that you will do a great job as you represent the Secretaries of State of this nation."

Commissioner DeGregorio recognized the leadership of Dr. Hratch Semerjian as previous Chair of the Committee. "He served at a time when we really got to the meat of the first generation of guidelines, and it took a lot of perseverance to get through this process which was new to NIST and certainly new to the Federal Government. 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."

Commissioner DeGregorio then addressed the crossroads to which the EAC has come and the subsequent resolution passed in May 2005 continuing the work of the Committee (attachment 2). "You are going to have a lot of discussions about the next generation of

guidelines. I know that this standards development process has been transparent and public all along. Your comments were posted on the NIST web site for everyone to see. It is very important that the public understands that they can participate. We encourage everyone to submit their guideline comments by the end of the public comment period at the end of this week."

Commissioner DeGregorio brought to the attention of the Committee the written comments from EAC Commissioner Martinez (attachment 3) distributed to you and the public in attendance this morning. "He has followed the work of the Committee very closely and has attended every one of the public meetings. His comments are timely and important, so we want to make sure that you follow them. In his memo, he addresses independent dual verification (IDV) and other security issues. We want to bring your attention to that."

Commissioner DeGregorio next addressed the future generation of guidelines and associated timelines for requirements related to the Voter Verified Paper Audit Trail (VVPAT) and usability standards for voting systems. He asked the Committee to note the impact to state and local election officials of when new guidelines are issued especially if they are issued in an election year with federal primaries and elections. "We note that the next iteration of the VVSG, including a substantial reformatting of the document is due to be delivered to the EAC in July 2007. Recognizing the time period that it took the EAC to go through our Federal Register publications, our 90-day period of comments, and our public hearings that we had, it is likely to take us into the late fall of 2007 or early 2008 to adopt these new guidelines. Again, it is of concern to me and I know members of our Commission to adopt new guidelines early in a presidential election year. We recognize that if we take the same posture to which we are moving with the first guideline iteration that there will be an implementation period of perhaps a year or two. Also, there is a time period for the community to come into compliance. Certainly if that time table could be moved up in some way that would be helpful. We have discussed releasing components of the next iteration in modules and indeed I think that is contemplated in the time line that has been suggested by NIST. That is a good thing because it does help the vendors to move forward with some idea of what guidelines may be coming out. Also I think it helps us to move forward to adopt these new modules as guidelines. So we just want to encourage that kind of approach because I think the earlier the better. "

Commissioner DeGregorio indicated the importance of the NIST and TGDC work in the future. The EAC has requested $5 million in FY 2007, and he hopes that this amount will remain in the President's upcoming budget request. He also noted the international implications of the work of the TGDC. "Specifically, at a conference of elections officials a couple of weeks ago in Budapest, Hungary, I had someone from Germany come up to me to tell me how closely they were following the guidelines development process. 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, 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."

Commissioner DeGregorio introduced fellow Commissioner Davidson. She welcomed everyone to her home state of Colorado for this meeting." It was a great honor for me to be a member of the TGDC. I want to compliment everybody on the Committee and at NIST for the amount of work they have accomplished. Nine months is a short period of time to develop the recommendations, and I really appreciate all the hard work."

Commissioner Davidson congratulated Secretary Gale on his appointment to the TGDC. "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. So, thank you for serving. It does take time out of your official state duties, but it's very important."

Commissioner Davidson noted the value of transparency and inclusion in both the election process and the TGDC's standards development process." I also wanted to say that as we move forward, it is important to involve the independent testing authorities in the future work of the EAC's standards and advisory committees. I think that will produce guidelines in a timelier manner. I think we can accomplish a great deal by working together as a team. At the EAC, we look forward to seeking the TGDC's guidance as we go through this guideline development process. It is going to be an exciting time. Again, welcome to Colorado. Thank you very much."

The Chair then recognized the written remarks from Commissioner Martinez. "As I mentioned at the beginning, Commissioner Martinez was not able to make the meeting today, but he did provide some comments I would like to read into the record. Then I will ask EAC Executive Director Wilkey to make some comments if he would like. The memo reads as follows:

> 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. Thank you as well as to Nebraska's Secretary of State, John Gale.
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> 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 addressed, 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 analyses; 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 development of 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 ensure 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."

Dr. Jeffrey's then welcomed Mr. Tom Wilkey, Executive Director of the Election Assistance Commission and opened the floor for his remarks. Mr. Wilkey congratulated Dr. Jeffrey and welcomed Secretary Gale to the TGDC. "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."

Mr. Wilkey expressed his admiration for the level of work accomplished in nine months in comparison with the five-year unfunded effort to produce the first 1990 Federal Election Commission voting system standards." I want to echo also the comments made by my Commissioners that we are very pleased with the kind of working relationship that we have with the staff at NIST. I do believe and echo Commissioner Martinez's comments that we are hopeful we can find a way to streamline this standard's updating process. We have often said that this is a living, breathing document. It's going to go on for a long time, and we need to be able to work out a process where we can get iterations 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."

Dr. Jeffrey thanked the Commissioners and Mr. Wilkey for their remarks. The Chair then called on Mark Skall of NIST's Information Technology Laboratory to review NIST's summary of activities since April 2005; report on related voting research/recommendation efforts; and update the Committee on the upcoming NIST Threat Analysis for Voting Systems Workshop.

Mr. Skall thanked Dr. Jeffrey. "I would like to echo the comments that the EAC Commissioners and Mr. Wilkey made. I often speak about standards and testing. I 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, then the stool keels over. I think there is a similar parallel in the relationship among the EAC, NIST, and the TDGC. I think all three parties are partners. They form a second three-legged stool, and they are clearly all necessary to complete what we have to do."

Mr. Skall then reviewed relevant events that occurred after the April 2005 TGDC plenary meeting. "At that meeting, NIST was directed by the Committee to make final edits and deliver the final VVSG to the EAC. We made the changes according to the Committee's resolutions. We also reformatted the document. A tremendous amount of thanks go to TGDC member Whitney Quesenbery who assisted us. In her real life, she is a usability professional. She was very valuable to us in making the document more usable. So we did reformat the document, resulting in a more readable format and delivered the version to the EAC on May 9, 2005, within the nine-month statutory requirements of HAVA."

Mr. Skall reviewed NIST staff and TGDC member presentations at the meetings of the EAC's Standards and Advisory Boards. He noted the invaluable feedback from Secretaries of State and State Election Directors at the summer meetings of the National Association of Secretaries of State and the National Association of State Election Directors. "To be frank, in the first iteration, we were really constrained by time and could not do some of the outreach we would have liked to do. We really feel we absolutely need to do that in this next iteration of voting standards." Specifically, echoing the comments of the EAC Commissioners, Mr. Skall indicated the need to be inclusive of the laboratory testing community and the election vendors in the development of the next

iteration of standards. He also reviewed the need to work with John's Hopkins and their staff working on the NSF-funded voting research. In addition, NIST plans on coordinating with the State of Maryland and their independent verification study.

Mr. Skall indicated the intention of NIST to host a Threat Analysis Workshop in the early fall of 2005. "We are writing security requirements guidelines, and it is very difficult to write requirements unless you know what the problem is. In fact, I would say it is impossible. This workshop is really a way to further elucidate and enumerate the exact types of threats that the community perceives. We want to get everyone together. We have 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. 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."

Mr. Skall summarized a July 2005 EAC/NIST planning meeting that included TGDC members Schutzer, Rivest, and Quesenbery. "We were all in tremendous agreement that, even though we had delivered the first iteration of guideline recommendations, 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 wanted to find a way to make sure that the future work we do is incorporated into whatever standard we produce in a way that the community could use it as soon as possible. We came upon this philosophy of providing "modular chunks" to swap into the existing standard. Just one caveat, this sounds great and we would like to do it, but we have to be careful that we put things in that are not 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 before we swap modules in such as VVPAT and IDV as well as the human factors work. Again, the tentative agreement was to use July 7, 2007, as our final delivery date. I know there is some concern with that date, and we can certainly look at that but that was our initial thought."

Mr. Skall concluded with the issue of Internet voting and the HAVA responsibilities of the EAC. He indicated that the attendees at the July meeting agreed that this plenary would be an excellent opportunity for the Committee to explore this issue. Mr. Skall yielded the floor to questions from the TGDC members.

A TGDC member asked Mr. Skall to clarify how the chunk update strategy works with the July 2007 date. Mr.Skall replied that July 2007 represents 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 these chunks, when feasible, into the existing VVSG. They will then be incorporated with other new material into the completed next iteration in 2007."

Another TGDC member expressed his concern over two apparently diametrically opposing ideas. "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 guideline

product in a reasonable time as those ideas are vetted out and mature. I am 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 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." Mr. Craft referred to the comment by Mr. Wilkey that the VVSG is a living work product."

Mr. Skall replied that he appreciated hearing from TGDC members especially those who have experience in the area of voting standards. "We have worked with a lot of standards committees over the years, and there are often 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 is very difficult to get implementation when the standard keeps changing. So, there is really a trade-off, I think, between how often one can update the standard. That is 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."

Mr. Craft offered relevant issues here for the Committee to consider on updating the standards. "Certainly we will want to get new material out. We also do not want to create too much churn in the system. Ultimately of utmost concern is what happens with the standards delivered and used in the field. We want to make sure that test labs in the certification process have time to take in new requirements, and that we have a time to get the feedback to make sure that the standard's intent is actually being realized in practice. For those reasons, typically I think these updating processes are managed in phases. That way you have the opportunity to take in feedback and can make sure that the last version that you updated actually delivers the intended benefit. Then as you introduce new materials, you allow the whole system to digest how that set of requirements is tested and how voting equipment is designed to meet the requirements. In the real world as we roll out and certify the current edition of the standards, and as the labs and the users of the systems try to apply them, we are very quickly going to find pieces that are not measurable and that have no basis for testing. We are going to discover pieces of the standards that are clearly in error. There will be a panic call from the test lab that has encountered the error. Either this Committee or some other committee seated by the EAC will have to meet with the certifying labs to make decisions on the errors and then issue recommendations for upgrades to the standards reflecting those decisions. I think designing a review process and implementing it needs to take precedence over, once again, some date in the future for a major voting standards module rollout."

Mr. Skall agreed and commented on two issues raised here. "We are talking about updating a standard based on discovered errors, and there certainly needs to be a process for this. NIST is very much involved in many areas related to developing test suites. Test suites very often find errors in the standard because you have to interpret the words. You usually find errors even in good requirements. Standards organizations always implement a feedback process to cover this type of update: to officially correct the errors and put out

revisions. The second issue concerns providing new functionality. This is really a second issue because it sets a different yardstick for the implementers. They both have to be addressed, and they are both treated a little differently as far as the phase-in process."

Dr. Harding commented on the global issues presented here. He referred back to earlier comments by the EAC Commissioners on the current new federal voting standards groundbreaking efforts undertaken by NIST, the TGDC, and the Commission. "So, our path does not have a whole lot of road signs. At the same time, in my experience setting standards with the U.S. Access Board, I find that it does take a long time in a public review process to create standards, rules, and guidelines that are enforceable. We have nearly completed our first attempt down this road of setting national standards for voting systems. As Mr. Craft mentioned, there will be need for clarification and for modification with this first set of guidelines as we move forward. Between 1992 and 2004, the U.S. Access Board dealt with supplementary clarity items along the way. So, using a 2007 date for the second formal iteration of national guidelines could be an appropriate target perhaps. In the meantime, I think it would be very prudent for this group to be able to respond to what we have learned from our election officials and from the citizen who is actually participating in the voting process by creating a methodology or feedback process. This allows us to learn from each iteration of the guidelines and to incorporate them into future 2008 and 2010 national elections."

Ms. Quesenbery agreed with Dr. Harding. "I think one of the things that we deferred in the first standards-setting round was creating a restructured guidelines document that would be more readable and more usable by all the affected parties. I think it is important that we start that restructuring work and move it forward. It is not going to happen in the scope of a nine-month crash to a deadline. At the same time, I agree with everybody who said that we are going to learn things in the requirements that need to be fixed. I know that in the human factors and privacy arena, research work that is ongoing at NIST right now will produce either additional requirements or clarification of requirements. For instance, we will be able to publish the performance benchmarks and 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. We were only able to touch the surface. With issues of personal assistive technology, there are technical challenges about how assistive technology might securely connect to voting systems that we were not able to address in the first set of guidelines. So, I do think it is important that the Committee not put off starting the document restructuring work because it will simply never happen if we delay."

Mr. Berger highlighted a breadth of options available to the TGDC. "The standard, while it is a vital tool, is not the only tool at our disposal. Certainly, speaking in terms of all who were involved in the election process, we have communications, training, and testing suites. I think one of the things we want to consider carefully as we move forward is where in these options do we get the best effect. It may well be that refining the standard further on some point is not the most effective way to reach a goal. Training may be more effective, better communication may be more effective, or more efficient testing may be a better tool. So, I would just encourage the TGDC 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."

Hearing no further questions, the Chair thanked Mr. Skall.

A motion was made by Dr. Harding that Subcommittee Chairs report an action plan to the Chair outlining a process for fixing deficiencies found in the TGDC work product output.

The motion was seconded. Dr. Jeffrey asked for a roll call vote.

Mr. Greene took a roll call vote. (Note: Communication problems here delayed a full recording of the vote until teleconference connections were reestablished with TGDC members not in attendance in Boulder.) The measure passed 11 Yes, 0 No.

Mr. Green made a clarification to the Chair that addressed the Committee voting on resolutions when communication failures ensue. "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. If we have a majority without them due to communication difficulties, we can proceed with the resolution."

The Chair opened the floor to EAC Executive Director Tom Wilkey for his comments.

Mr. Wilkey first commented on the previous discussion. "I think it serves the election community well to get the updated pieces of future standards out into the marketplace, and I think that procedure is 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 2006, part of that process will be delineating an appeals procedure where we will be continually working with NIST on the issues that come up through testing and evaluation such as: 'What did this piece of the guideline mean?' This is going to be an ongoing process. Certainly we do not want to take away from the fact that there will be a reformatted guidelines version in July 2007, not at all. We look forward to that. We also feel that we would be very well served to get out any pieces or "chunks" into the marketplace when complete, if you will, both for our vendors, our ITAs, and the election community at large."

Mr. Wilkey then reviewed both the public comment process for the VVSG and the certification process for voting system laboratories. "As Commission DeGregorio mentioned, tomorrow at the close of business is the close of our ninety-day comment period for the current guidelines. We were very fortunate to be able to obtain the services of Kennesaw State University in Georgia to take over the whole process of collecting these public comments, putting them up on our web site, developing a protocol, and implementing a whole database structure. Merle King, Director of the Kennesaw State Center for Election Systems, did an excellent job of putting a report together. He delivered that report to the EAC this past week."

Mr. Wilkey went on to describe the process for posting all comments received on the web site. “By placing all comments online regardless of their form of submission, the public was able to confirm that their comments had been received and reviewed. 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.”

Mr. Wilkey addressed the handling of duplicate, extensive, and bundled comments as well as comments on the document’s glossary. “The EAC has requested Kennesaw State to further develop the glossary, 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.’ ‘Non-extensive’ comments include spelling and typographical errors, formatting errors, pagination, confirmation of glossary definitions to authoritative sources, and affirmation of the currency and correctness of references. There are the ‘extensive’ comments, which ‘will require more thorough research and may extend into the areas of law and policy. Examples of ‘extensive comments’ include changes from ‘should’ to ‘shall’ or visa versa, alteration of scope or the subject under consideration, technical specifications, and changes in performance of a component of a voting system. Resolving these kinds of comments will require some research and perhaps multiple passes through different reviewers. In summary, Kennesaw has implemented a system that tracks every comment from its origin to its resolution. The resolution categories will be (1) incorporated into the Voting System Guidelines as submitted, (2) incorporated into the guidelines after modification, or (3) unused.” Mr. Wilkey indicated that he expected many comments to be submitted just before the deadline from a number of organizations, vendors, and independent testing authorities who have not yet commented.

Mr. Wilkey then updated the TGDC 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 also carrying out the duties related to the testing, certification, decertification, and recertification of voting systems hardware and software. We look at our process twofold. First, as a national program, the primary concern of the EAC is that the voting 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 we decide the date that the VVSG goes into effect and that is still under discussion. 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 noncompliant units are delivered and what corrective actions they can take? Will election officials and poll workers use the system as intended? What are the established normative standards, which right now are the 2002

Voting System Standards, and what will become the final VVSG by the EAC?' And we know that no matter how well a standards document is proposed, accepted, and finally adopted, there will always be opportunities for looking at a piece of a standard or guideline and saying, 'Now, what exactly did they mean by that?' In those instances, we need to be able to make some necessary changes or corrections to rectify clarity issues. Certainly we are working closely with NIST and the National Voluntary Laboratory Accreditation Program (NVLAP) for the accreditation of laboratories. NIST's NVLAP has already begun the application process for ITAs and expects to submit to the EAC an accreditation "A" list of laboratories to be accredited sometime in mid-2007. In the meantime, the EAC has grandfathered the three ITAs that are currently accredited by NASED." Mr. Wilkey noted that the NASED qualified laboratories will need to re-apply under the NVLAP accreditation procedures.

Mr. Wilkey concluded, "We are looking at 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. The 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, as is reviewing the test reports and posting the test reports up on our web site for everyone to see. Certainly the process will include interpretations, petitions, appeals, and complaints. We are also looking at the processes for obtaining clarification, initiating change, and redressing grievances. I will assure the members of the TDGC that as our procedures become available and adopted by the Commission, they will be transmitted to you for your review and evaluation."

Mr. Wilkey thanked the Chair and agreed to take questions.

Dr. Rivest inquired whether the EAC envisioned a role for the TGDC in the comments resolution process. "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 indicated that a review of the deliberations of the Committee would be important in some instances. "We will be working with NIST staff. We will also be looking at the record of your discussions, what come out of them, and how the decisions were made. Certainly, if need be, we will be reaching out to the chairs of the TGDC subcommittees to get, perhaps, their view of what happened during discussions. So, I see it as very broad-based role and certainly for the most part, I think we intend to work very closely with the NIST staff, looking at the record as it evolved from your Committee meetings."

Ms. Quesenbery asked a question regarding the process for comment disposition. Specifically, will the EAC label comments as accepted, rejected, or changed as is often done in a standards development process? Mr. Wilkey indicated that all comments would

be so researched, and the outcome of each comment resolution would be made publicly available at the end of the process.

The Chair thanked Mr. Wilkey and adjourned the meeting for a twenty-minute break.

**September 29, 2005: Morning Session # 2**

The Chair apologized to the TGDC members participating via teleconference who were experiencing audio difficulties. He indicated that technicians would continue to work on the problem, and that hopefully by the afternoon, the problem would be remedied. Dr. Jeffrey then asked Mr. Greene to call the roll.

Mr. Greene reported to the Chair that 11 members were participating at this time.

The Chair then called on Mr. John Wack and Ms. Barbara Guttman of NIST's Information Technology Laboratory to present a preliminary report on NIST's outline and timeline strategy for the next VVSG iterations.

Mr. Wack and Ms. Guttman made the following points in their presentations:

- The VVSG 2007 document would be completely restructured and include a more usable design.
- There will be expanded requirements for human factors, security, and core areas.
- The requirements will reference their corresponding test methods or test cases.
- A Terminology Standard will provide common vocabulary for all terms and definitions based on the current voting systems glossary.
- NIST will collect current usage election-related terminology and combine it with common language guidelines.
- A Product Standard will provide human factors, security, and various core requirements for voting systems.
- Product Standard requirements will be organized by voting system activity (e.g., pre-election, casting, counting, and organized by voting system profiles).
- The Product Standard will contain a conformance clause and reference models.
- The voting system testing laboratories (VSTLs) will have standards on data to be provided.
- The general work plan involves the TGDC working groups developing chapters.
- The chapters will be sent to the TGDC as a whole for comment.
- The TGDC will provide formal guidance/approval at plenary meetings,
- The final VVSG 2007 will be delivered in July 2007.
- A complete testing standard will not be included in July 2007 deliverable.

Ms. Guttman briefly discussed the strategy behind the document's work plan. "This strategy we are presenting to you, the TGDC, needs to be your strategy. This is a proposal to the Committee that you can modify and then adopt or reject. The VVSG document that will be delivered in July 2007, if you decide on that date, is a document that will come from the TGDC." She noted that updates on the document's progress

would be reviewed during publicly accessible TGDC subcommittee teleconferences. Formal approval of preliminary VVSG documents and the final draft will take place at public plenary sessions of the TGDC. Ms. Guttman concluded noting that the development of test suites will require further work beyond July 2007. Thus, a complete testing standard will not be available with this version of the VVSG.

The Chair thanked Mr. Wack and Ms. Guttman. He opened the floor for discussion.

Mr. Craft addressed the question of the testing standard, specifically, useful work already done by states such as Florida. "My concern is that there is a lot of 'prior art' that is out there now that has really not been published in the current draft of the standards. The existing testing labs and some the states have been testing to the current standards for some time. We have standard test suites that we run with valid approaches. In the areas of system security and system validation, there is some testing work that has not been published which a lot of states could use in the short run. As regards accessibility, in Florida and I am sure other states, we have very specific functional requirements for an audio ballot. We have very specific layouts for test screen ballots and paper ballots which are intended to make them usable. So there is a lot of good work out there. It obviously needs more research and it needs to be expanded by July 2007. However, I think there is a lot of related work product there that could be added to the existing standards in 2006 rather than waiting until July 2007."

Ms. Turner-Buie commented on compliance concerns for state and local election officials. "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 and subsequently the next VVSG to be issued by the EAC. When these are completed with a deliverable on July 2007 and the EAC adopts it in early 2008, election officials want to be compliant for the primary and general election of 2008. Compliance will be extremely difficult, if not impossible, for them to meet with this timetable."

Ms. Guttman noted that the implementation strategy for this VVSG will come from the EAC. She noted the two-year implementation plans for the current VVSG out for public comment.

Secretary Gale had concerns with an implementation timetable as well. "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, particularly the EAC and NIST. Everybody is doing double and triple duty because we have state changes in election law we are trying to accommodate. The states also have new voter registration systems that we are trying to implement. We are trying to accommodate provisional balloting changes. If we have too many ongoing changes in election equipment requirements, the vendors will have difficulty with the challenge. Even in Nebraska, we have 12,000 volunteers who have to be trained to run these elections. If we over compound the difficulties just to meet an arbitrary deadline, and then throw it into a presidential election year, it seems like we

really are compounding the problems for election officials who want to have accurate and trustworthy elections. They want people to feel comfortable when they come to vote. They want people to know that their vote is going to be cast and is going to be counted. At the same time, there is only so much in an election official's budget to conduct training or to spend time understanding and implementing changes in the VVSG. I think it could cause almost a deflation in the election industry because it is a fragile enterprise. It is not like the banking industry or the insurance industry. It depends on a lot of volunteers and a lot of officials with very limited budgets. I am concerned about the deadline unless there is something in the statutes that mandate it."

Ms. Guttman noted that the deadline for this next version of the VVSG is not statutorily mandated. "The TGDC should feel free to propose a different one."

Dr. Harding commented on some realities from his perspective. He was concerned with the one-time infusion of federal dollars to the states from HAVA. "It is the hope of the disabled community that the EAC, in their wisdom, will set the standards bar as high as they reasonably can go in 2006 because the states may never be able to buy equipment again. We could signal to the industry that the expectations for the disability components of voting equipment can easily be modified and can easily be upgraded without any threats to security or any threats to peoples' dignity. Having said that, I have no particular heartburn with the timetable except that I think it gets back to the fact that we are changing this stuff radically without the prospect of future funding. I would like to urge the TGDC and the EAC Commissioners to really set that bar as high as we can, and that the modular updates to the standards could be natural fixes or improvements in clarity of the standards to get us through the upcoming elections." He offered to make a motion to this effect after further discussion by the Committee.

The Chair noted the two issues here, one being the modular update approach and the second being the deadline date of July 2007.

Mr. Berger indicated he shared the concerns expressed by his colleagues, especially with respect to the fragility of the election system, the issue of unintended consequences, and the inclusion of all voters. "I think a question very much is before us for the 2005 VVSG when it's 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 standards work so that we are moving consciously towards higher confidence in a desired end result. My second issue centers on the uniformity of evaluation. What is our judgment that the standards address the same equipment coming into different testing labs will get the same evaluation or even coming into the same lab at different times? My third issue concerns whether we have created a mechanism to raise unforeseen issues for which we may not have the ability yet to even write specifications. I think it may be important that we be able to afford ourselves the ability to call out 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."

Dr Rivest commented on the timetable. “I think that the timeline as proposed here looks very plausible to me. I think we need to decouple the issue of whether this a reasonable timeline for the work that is proposed versus how this timeline interfaces with the rolling out of elections. I look to the EAC commissioners to give us guidance on the latter matter, particularly in terms of the work proposed and the amount of time allocated for doing it.”

Mr. Gannon drew attention to the disposition of TGDC resolutions. He noted that it was important to ascertain that the work plan addresses each resolution. “Completion time should be allocated in the delivery schedules for the tasks in the resolutions to be sure we cover them and do not get lost in the specific detailed activities.”

Ms. Quesenbery commented on the issues raised by Mr. Berger and the importance of the structure of the standards document with high-level goal requirements and specific requirements under them. “I think it’s very important that we continue to structure our work so that it just does not become a laundry list of technical requirements but does, in fact, point toward the goal of improving elections, especially if we are going to do this a little bit piecemeal with the modular or ‘chunk’ approach. We can then say we are replacing this module because we now can address the goals we could not address in the past, for example.”

Hearing no further discussion, the Chair asked for unanimous consent to accept the modular or “chunk” strategy for delivering updates to the VVSG.

Ms. Quesenbery asked that we ensure that the TGDC members on teleconference are in agreement with the resolution.

The Chair ascertained that all teleconference members were participating. He so noted that the resolution passed by unanimous consent.

The Chair noted that after discussion with the EAC Commissioners, he would offer the following motion related to the deadline for the delivery of the next iteration of the VVSG. “The TGDC asks the NIST staff working with the EAC to come back with a proposed delivery time for the next version of the VVSG that would meet the needs of the EAC commissioners, working backwards to allow the states to adopt and incorporate the technologies as well as assuring a technically viable product. Is there a second?”

The motion was seconded, and the floor was opened for discussion.

Dr. Harding noted the advisability of determining a time for NIST and the EAC to report back to the TGDC on the deadline date.

Dr. Jeffrey agreed and amended his motion to read, “The TGDC asks the NIST staff working with the EAC to report within 60 days to the TGDC subcommittee chairs, a proposed delivery date for the next version of the VVSG that would meet the needs of the

EAC commissioners, working backwards to allow the states to adopt and incorporate the technologies as well as assuring a technically viable product."

The motion was seconded.

The Chair asked for unanimous consent. Hearing no disagreements, the motion was passed.

The Chair then moved to accept the outline for the next VVSG. "NIST believes the preceding Preliminary Report of technical support titled, "An Outline and Timeline Strategy" for the next VVSG iterations, responds to all relevant adopted resolutions by the Committee. Unless there are supplemental directions or corrections, the technical support and related work product will continue to be developed consistent with this Preliminary Report. Are there any questions, further directions, or corrections?"

The motion was seconded for discussion.

A TGDC member requested that the outline slides be displayed once more for clarity.

Dr. Harding noted the advisability of a checklist that would address the comments of Mr. Gannon and Ms. Quesenbery. The checklist would map the TGDC resolutions to the outline and ensure that the intent of the TGDC was met in the final document.

The Chair agreed to deal with the checklist as a separate motion. He asked for a motion to accept the outline by unanimous consent.

The motion was moved and seconded.

Hearing no disagreement, the outline report was adopted by unanimous consent. The Chair entertained a motion for NIST to provide a checklist that maps the TGDC resolutions into the document outline.

Dr. Harding so moved. The motion was seconded.

The Chair asked for unanimous consent. Hearing no disagreement, the motion was passed by unanimous consent.

At this time, I call on Dr. Alan Goldfine and Dr. David Flater of NIST's Information Technology Laboratory to present the Core Requirements and Testing Subcommittee Preliminary Reports for the next VVSG iterations.

Dr. Goldfine and Dr. Flater reviewed the following core requirements issues in their presentations:

- Prior core requirements VVSG 2005 deliverables to the TGDC including:
  - Glossary

  - Conformance Clause
  - Modified Mean Time Between Failure Test
- VVSG Standards architecture including:
  - profiles,
  - compliance points,
  - formalized implementation statements
- Software integrity and coding conventions
- Methods for conformity assessment including:
  - Logic verification
  - Test protocols
- Casting, counting, and reporting requirements
- Process model
- Performance and workmanship requirements
- Research papers on VVSG maintenance and information sharing.

Several Committee members had questions concerning the term profiles and its use in section 4.2. Ms. Quesenbery asked if they were organized by voting activity. Dr. Flater responded that these profiles were meant to represent optional functionality of the voting system. Most of them support in-person voting and are not organized by who will use them (i.e., limited English proficiency, etc.)

Mr. Craft inquired as to the term 'profile.' Does it have 'prior art'?

Dr. Flater responded that profile is a term used by a number of standards organizations. "The 'prior art' for the use of the word 'profiles' comes primarily from ISA. There is a definition. It is also used in various other standard organizations to refer to specializations or subsets of a standard. No, it is not a new term that has just been invented. It is, however, a word that may have been used too broadly."

Mr. Gannon agreed with Mr. Flater. "It is used in many standards communities including W3C. In general, profiles are, like David says, a subsection of the standard intended for a specific constituency."

Ms. Quesenbery asked a further clarification as to audio ballots. "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."

Dr. Flater responded to the basis for the use of the term profile here. "The profile 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 checked his understanding of the use of the term profile. "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 then be standards for that particular profile."

Dr. Flater replied that this was a correct interpretation. He agreed with both Ms. Quesenbery and Mr. Craft that the use of the term profile needed to be more clearly defined here. Otherwise confusion will extend to the general public.

Dr. Rivest suggested the use of examples here. "Perhaps the use of some examples when we get to issues like this will make it very clear what we mean and what we don't mean. It might help in facilitating the conversation."

Mr. Berger had a final question on the issue. "Thinking of the testing lab that receives an innovative product that perhaps in some way we did not envision, it blends two profiles. Do you have some mechanism, comparable to a technical construction file, where the test lab can appropriately develop a test plan blending profiles for this product?"

Dr. Flater indicated that he had additional informational materials that covered the blended systems. He will circulate those materials after the meeting. "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 that 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: that is, those systems that conform to the requirements in both profiles, and you get the union of the requirements."

Dr. Harding asked Dr. Flater to elaborate on the use of the phrase 'published, reviewed, and industry-accepted coding conventions.'

Dr. Flater indicated that these coding conventions refer to commonly accepted industry conventions. "What this phrase refers to is the use of the coding conventions that are in the standard but also allows for the use of some which are considered published, reviewed, and industry-accepted. Those terms are not defined in the standard. It's just supposed to be commonsensical. We are looking at coding conventions that the marketplace or whoever finds to be acceptable."

Mr. Kraft provided an illustrative example here. "We had a voting system come through ITA testing that was using an uncommon programming 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. That's how they were evaluated."

The discussion of coding conventions continued. Mr. Craft had a suggestion here. "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 goal. I think

probably the risks we are fighting in source code reviews affect those vendors who have a lot of ad hoc approaches to building code. You get code that has not been built with a consistent standard. That is, when we find variables that aren't properly defined producing system errors that bite us when we get in the middle of an election. I'm wondering also, if this does not circle back around to profiles and having each language in common use categorized as a profile, and then developing a process for vendors who use either a language or a standard that does not fit the established profiles. Then there is a process for accepting their coding conventions and perhaps retiring them as well."

Mr. Berger asked a question dealing with software qualification. "With respect to voting software, 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?"

Dr. Flater responded with the three-legged stool analogy. "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 certainly resolves the whole issue of what constitutes credible."

The Chair noted that it was 12:30 p.m. and time for lunch. He adjourned the meeting until 1:30 p.m.

**September 29, 2005: Afternoon Session #1**

The Chair convened the afternoon session of the plenary meeting. He asked Mr. Green to call the roll. Mr. Green reported that a quorum of nine was present. (One additional member on the teleconference connected to the meeting after the roll call was completed.)

The Chair opened the floor again to Drs. Flater and Goldfine.

During the discussion of logic verification, a TGDC member inquired which profiles require verification. Dr. Flater answered that he believed logic verification applied to all parts of the voting system that have tabulation functionality.

Mr. Berger indicated that the verification could apply beyond the tabulation software. "Basically your election definition system is the part of the system. It creates the data base in which results are going to be dumped and creates the links between candidate positions and their associated data fields. Even though its not tabulation software, it's a very important part of the system. It certainly should come under this kind of review."

Dr. Flater agreed that this and other parts of the voting system as defined are part of the scope of such a review.

A TGDC member inquired as to how typical test cases could be submitted. Dr. Flater suggested that since this development of test cases would be public, they could be submitted as public comments to vote@nist.gov.

Mr. Kraft had a question concerning the determination of a risk assessment. "We all know testing is a sampling methodology. We who have been testing these systems for a number of years took our knowledge of the strengths and weaknesses of particular voting 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 created 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."

Dr. Flater noted that this issue of risk assessment is delineated currently in the VVSG. "What you described falls in the category of implementation dependent, white box testing which is currently specified in the VVSG. I am not proposing to change that in any way except possibly to clarify the text. 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. By no means am I suggesting eliminating what you just described."

Dr. Flater and Mr. Craft agreed that the assessment of test suites is an area that could be expanded in the VVSG as to what the appropriate method is for assessing those risks and for documenting that they have been properly assessed.

Mr. Craft initiated a discussion of casting and counting requirements. "What we actually need here 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. Obviously with a mark 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 it is an election procedural issue but it is something that one way or another the voting system has to give the administrator some tools to execute that procedure."

During a discussion of unofficial versus official election reports, Mr. Craft offered some clarification. "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 that you take in from the precincts and you publish on election night. Different jurisdictions have different standards as to how tightly those results are reviewed before they are released. Obviously you do not want to release results with

gross errors in them. Official results are those results issued after the entire canvas process is through. These results are issued after your provisional ballots and all of your write in ballots have been through the review and appeals process the state sets out. 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. That is the work product which, at the end of that process, the judge and the canvassing board signs. Frequently the official result as described is a different result from the unofficial result."

During Dr. Goldfine's presentation, TGDC members expressed confusion on the legality of punch card systems under HAVA. Mr. Craft indicated that if punch cards are legal, there is a body of 'prior art' that goes beyond the 2002 VSS requirements, some of it developed by IBM. He noted that if punch card systems are allowed under HAVA, they must prevent over votes. Considerable discussion ensued on what requirements would be particular to punch card systems and what issues fall into election administration.

Dr. Goldfine reviewed the two issue papers in the hand out materials dealing with VVSG maintenance and certification issues.

There being no further questions, the Chair noted "NIST believes the preceding Preliminary Reports of technical support titled: Core Requirements and Testing Subcommittee Preliminary Reports for next VVSG iterations responds to TGDC Resolutions 24-05, 25-05, 27-05, 29-05, 31-05, and 32-05. Unless there are supplemental directions or corrections, the technical support and related work product will continue to be developed consistent with this Preliminary Report. Are there any questions, further directions or corrections?"

The Chair opened the floor for a motion to accept the Report. A motion was made and seconded.

The Chair asked for unanimous consent on the motion. There were no objections. The motion passed.

At this time, the Chair called on Dr. Sharon Laskowski of NIST's Information Technology Laboratory to present the Human Factors and Privacy Subcommittee Preliminary Reports for the next VVSG iterations.

Dr. Laskowski reviewed the following issues in her presentation:

- Language in HAVA that guides the human factors and privacy standards work:
  - The system must be "accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters." -- 301 (a)(3)(A)
  - At least one voting system "equipped for individuals with disabilities" must be used at each polling place for federal elections held on or after January 1, 2006. --. 301 (a)(3)(B).

  - And "provide alternative language accessibility as already required by section 203 of the Voting Rights Act." -- 301 (a)(4).
- Resolutions on four key TGDC principles also guide the work on accessibility, usability and privacy (#03-05,#05-05,#06-05 and #08-05)
- Five additional TGDC resolutions direct the subcommittee's approach to human factors and privacy requirements(#02-05, #04-05, #09-05, #10-05, #11-05)
- Critical decisions were made in applying the resolutions to the initial VVSG guidelines including:
  - Primary focus on general equipment vs. election specific
  - Requirements should be testable
  - Deferred developing conformance tests for equipment
  - Performance vs. design guidelines
  - Performance guidelines preferred
  - Recognition of environment for deployment of equipment
  - Focus on guidance for ballot design, setup, instructions, etc. in next iteration
  - "Shoulds" will migrate to "shalls"
- The VVSG strengthens and further defines the accessibility and usability requirements in VSS 02
- Research is underway to further address resolutions in future VVSG iterations
- Advisory and Standards Boards as well as advocacy groups have pointed out additional issues in the draft VVSG
- Issues in the VVSG that are causing debate that need to be addressed include:
  - Should voters be able to connect personal assistive technology?
  - Are the requirements for non-written languages clearly noted?
  - Dexterity requirements are not as strong as those for visual disabilities
  - Should the low vision requirements be made more stringent?
  - Can the requirements for speech in the audio ballot be less production-specific and more quality-oriented?
  - To what extent should cognitive disabilities be addressed?
  - What are the issues surrounding "vote by phone" for those with disabilities?
  - How should "best practices for election officials" in using voting systems be communicated?
  - "Should" vs. "shall"?
  - How do to factor in the feasibility and cost
- Writing testable standards for comprehensive interoperability is a challenge
- Limited English Proficiency Requirements are in terms of voters not languages
- Requirements for dexterity disabilities and blindness are not equal
- Poor reading vision, especially for paper ballots, is not adequately addressed
- VVSG prefers human recorded speech over synthesized speed, but technology is improving
- Vote by phone as accessible voting station not researched for current VVSG
- Cognitive disabilities are not addressed in detail
- An "accessible" voting system can be deployed in a way that makes it inaccessible.

The TGDC engaged in considerable discussion regarding personal assistive devices. In response to a Committee members request for descriptions of personal assistive devices beyond head sets with audio jacks, Dr. Laskowski clarified with examples. "Sip and puff devices are an example of pneumatic switch technology, but there are a number of other different kinds of switch technology. However sip and puff devices are a good example of the inherent interoperability. You are not just providing output but you are also providing input to make selections from the DRE. The DRE has to be able to understand that particular switch technology and as Said, there are a number of different products. In order for us to research that issue we would, for example, do a workshop with vendors who build switch technology so we would understand what is out there in the field."

Mr. Craft noted that this gets to the crux of the issue with personal assistive devices because so much of this technology is not standardized. "For example with the sip and puff devices, I think we are going to have to consider personal assistive devices really on a case by case basis. I think we can all agree that the voting system should not be expected to allow you to vote with your eyeglasses on a video ballot. Although the voting system provides you with an audio ballot, it should not conflict with hearing aid devices. When we get into the technologies of Braille keyboard devices and sip and puff devices, I think we are going to have to bring those into the category of assistive devices that are allowed on a case by case basis."

Dr. Laskowski deferred to Ms. Quesenbery to read a recommendation on personal assistive technologies . "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." Ms Quesenbery noted that this is an instance where slight changes in wording can change the meaning of the requirement substantially and it needs to have careful technical review.

Mr. Elekes indicated that he concurred with the Subcommittee's recommendation.

Dr. Rivest agreed that this area requires further research. "I thought your 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 with everything else, it's research."

Dr. Jeffrey then noted that "NIST believes the preceding Preliminary Reports of technical support titled: The Human Factors and Privacy Subcommittee Preliminary Reports for the next VVSG iterations responds to all relevant TGDC resolutions. Unless there are supplemental directions or corrections, the technical support and related work product

will continue to be developed consistent with this Preliminary Report." He then opened the floor for further directions or corrections."

Dr. Rivest initiated a discussion of the standard with respect to voter interactions, specifically when a voter discovers that the equipment is not working properly. Ms. Quesenbery noted that the Human Factors and Privacy Sub Committee did not specifically address this issue. "I am 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. This seems like an intersection between a core requirement – such as how do you manage equipment failure, and some polling place requirements – such as how do you help the polling place workers manage equipment failure? So what we have a bit of a baseline. We are beginning to see issues come together like personal assistive technologies that have both security and usability implications. We need to do some cross committee work on issues like these to be able to resolve them. I think that work would fit well with our modular chunks approach as well."

Ms. Quesenbery then addressed the concerns of election officials in this area. " At the EAC 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 other instances where synthesized speech might work well. With respect to speech quality, the election officials asked for the standards to delineate the result that we want. In other words, could we please focus on that rather than dictating the technology? The minute we dictate technology, it eliminates entire systems from their consideration when they may have a way of solving the problem."

Mr. Berger referenced relevant work being done at NIST and at universities. "Let me say there is some excellent research being done about three corridors from here for the Department of Homeland Security for first responders. That is relatively new work. There is also some research that is just going to be wrapped up in the next couple of months at Gallaudet University on particular needs for people with hearing loss. I think some of this work can allow us to address better metrics than we may have been able to even six months ago."

There being no further question or discussion, the Chair entertained a motion to accept the human factors and privacy preliminary report. A motion was made and seconded.

The Chair asked for unanimous consent to adopt the motion. There being no objection, the motion was adopted by unanimous consent.

Dr. Jeffrey adjourned the meeting for a fifteen minute break.

**September 29, 2005: Afternoon Session #2**

At this time the Chair called on Mr. Nelson Hastings and Mr. John Wack of NIST's Information Technology Laboratory to present the Security and Transparency Subcommittee preliminary reports for the next VVSG iterations.

Mr. Hastings covered the following topics in his presentation:

- Approach & Methodology to the development of VVSG security requirements including:
  - Bases for requirements (VSS 2002, IEEE P1583)
  - Consolidated general security requirements (e.g. Cryptography) in a comprehensive security section
- Current security activities include threat analysis research, open ended testing vulnerability research and creating an access control role model
- Consolidate general security requirements (e.g. Cryptography) in a comprehensive security section
- Consolidate general security requirements (e.g. Cryptography) in a comprehensive security section
- Research for future VVSG 2007 security sections including:
  - Physical Security - April 2006
  - Communications - April 2006
  - System Integrity Management - July 2006
  - Hardware Security - July 2006
  - Independent Dual Verification (IDV) Profile - October 2006
  - Threat Analysis Appendix - January 2007

The Chair asked if the Committee had any questions for Mr. Hastings before moving on to Mr. Wack's presentation.

Secretary Gale inquired on the differences between these security standards and the 2002 VSS security standards. Mr. Hastings indicated that many of the security standards in the VVSG originated from the 2002 VSS. The requirements for 2007 VVSG will enhance and broaden the current requirements in the areas of software set up and validation as well as software distribution and add some additional requirements.

Secretary Gale asked if the standards will apply only to DRE systems or will the standards apply also to optical scan as well as emergent technologies. Mr. Hastings indicated that the requirements would likely apply relative to the particular profiles discussed earlier.

Secretary Gale inquired as to whether the VVSG requirements would apply to both networked and non-networked DRE systems. Mr. Hastings answered that it was his understanding that the requirements would apply to both systems.

Mr. Berger asked a question with reference to the scope of the upcoming Threat Analysis Workshop regarding protection profiles and the common criteria. Mr. Hastings answered that the objective of the workshop was not to develop protection profiles.

Mr. Berger inquired as to the assessment of appropriate solutions for security risks balancing equipment solutions with procedural solutions.

Mr. Hastings referred back to the earlier core requirements discussion. "I think, once again, we will go back to the profiles of the capabilities of a particular voting 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."

There being no further questions, the Chair asked Mr. Wack to continue with the security and transparency presentation.

Mr. Wack presented information on the following security issues:

- A review of IDV: independent dual verification
- The VVPAT requirements in the EAC VVSG are an instantiation of IDV
- IDV currently in the marketplace
- Current IDV issues including:
    - Usability of multiple representations in comparisons and audits
    - Usability for both voters and election officials
    - Accessibility of multiple representations
    - Interoperability of record formats to facilitate 3rd party audits, IDV add-ons (e.g., Witness devices)
- The State of Maryland Independent Verification Study
- Next steps related to IDV in future VVSG iterations including:
    - The EAC has requested that requirements for other types of IDV be developed in future VVSG iterations
    - Core IDV and Witness requirements are needed in near-term to guide marketplace development
    - More research on usability of multiple records for election officials required
    - Issues with accessibility in some IDV approaches need further study

There being not further questions or comments the Chair proceeded with the formal adoption of the report. "NIST believes the preceding Preliminary Reports of technical support titled: Security and Transparency Subcommittee (STS) preliminary reports for next VVSG iterations respond to TGDC Resolutions 12-05, 14-05, 15-05, 16-05, 17-05, 18-05, 21-05, 22-05, 23-05, 35-05, and 39-05. Unless there are supplemental directions or corrections, the technical support and related work product will continue to be developed consistent with this Preliminary Report."

There being no further directions or corrections, Dr. Jeffrey asked for a motion to adopt the report by unanimous consent.

A motion was made and seconded. The report was adopted by unanimous consent.

Dr. Jeffrey called on Ms. Carol Paquette of the EAC to provide a report on internet voting.

Ms. Paquette provided the following information to the TGDC in her presentation:

- FY05 National Defense Authorization Act Conference Report Language :
  - "The conferees encourage the Secretary to provide funding to the EAC and NIST to advance electronic absentee voting by U.S. voters located overseas and Uniformed Services voters."
- Need to Define Internet Voting System including:
  - Where are the system boundaries?
  - What are the interfaces to the Election Management System?
    - Voter registration data
    - Ballot style definitions
    - Tabulation
    - Audit logs
  - What are the functions of the system?
  - What is the voting device?
  - Who controls it?

- Voting-over-the-Internet architecture

Dr. Jeffrey opened the floor for comments from TGDC members.

Dr. Rivest noted that this authorization legislation under discussion pertained to the Department of Defense and it was not clear what activities could be undertaken by NIST or the EAC. He also had considerable concerns with Internet voting in general. "So if there are standards to be developed, then when one develops a standard, the presumption is that the goal is achievable. I personally do not believe that we have the technology to make Internet voting secure yet. That is at least a decade off . Trying to develop standards at this stage is premature and something that I would say is ill advised in spite of the worthwhile desire to support our troops with Internet voting. I think we need to look at a lot of different approaches. Internet voting may not be the best one just because of the security issues. So, I think we first need to have a discussion about security of Internet voting. I think developing the standard has the presumption that one can vote securely on the Internet. I do not think we are there yet."

Mr. Craft commented on an alternative voting method that accomplishes a similar goal. "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. Number two, I think there is a lot that we can do to help our overseas military and embassy personnel vote more easily. I think the solution that is

readily available uses a kiosk. The biggest problem right now with internet voting is securing the client in the hands of the voter and a kiosk allows you to do that."

Mr. Gannon inquired into the documentation from the Organization for the Advancement of Structured Information Standard's (OASIS) Election Voter Services Committee that contained, in fact, examples of on-line voting mechanisms in Europe. "There were some references to examples on-line voting occurring and I didn't know whether or not you had the advantage of analysis or feedback from that."

Ms. Paquette indicated that the EAC would touch base again with the OASIS group.

Dr. Jeffrey noted that the DOD legislation did not refer to appropriations and that the language 'encouraged' efforts rather than mandating them. The Chair asked if there were any further resolutions to be discussed.

Hearing no further questions or discussion, the Chair noted that the motions adopted at the meeting will provide further direction to NIST staff. There being no further clarifications, Dr. Jeffrey thanked the EAC Commissioners and the TGDC members for their participation. He also thanked the NIST staff for their substantial efforts.

Hearing no further discussion or additional issues, the Chair adjourned the September 29, 2005 plenary session of the TGDC.

**TGDC Resolution Voting** **Plenary meeting** **September 29, 2005**

| Resolution Number | Williams | Berger | Karmol | Craft | Gale | Elekes | Gannon | Harding | Miller | Purcell | Quesenbery | Rivest | Schutzer | Turner-Buie | Jeffrey | Tally Y-N-A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/29/05 Roll Call | * | Y | * | Y | Y | Y | Y | Y | Y | Y | Y | Y | * | Y | Y | 12 Present |
| Agenda | * | Y | * | Y | A | Y | Y | Y | Y | * | Y | Y | * | Y | Y | 10-0-1 |
| 4/20-21/05 Minutes | * | Y | * | Y | Y | Y | Y | Y | Y | * | Y | Y | * | Y | Y | 11-0 |
| Subcomms. Submit work plans | * | Y | * | Y | Y | Y | Y | Y | Y | * | Y | Y | * | Y | Y | 11-0 |
| 11 am Roll Call | * | Y | * | Y | Y | Y | Y | Y | * | Y | Y | Y | * | Y | Y | 11 Present |
| Mod. VVSG Delivery Strategy | * | | * | | | | | | * | | | | * | | | Unanimous Consent |
| VVSG 2007 Delivery Date (60 Days) | * | | * | | | | | | * | | | | * | | | Unanimous Consent |
| Adopt Outline | * | | * | | | | | | * | | | | * | | | Unanimous Consent |
| VVSG Checklist | * | | * | | | | | | * | | | | * | | | Unanimous Consent |
| 1:30 PM Roll Call | * | Y | * | * | Y | Y | Y | Y | * | * | Y | Y | * | Y | Y | 9 Present |
| Prelim Rpt: Core Require. | * | | * | | | | | | * | | | | * | | | Unanimous Consent |
| Prelim Rpt: Human Factors | * | | * | | | | | | * | | | | * | | | Unanimous Consent |
| Prelim Rpt: Security | * | | * | | | | | | * | | | | * | | | Unanimous Consent |

Table 1

Y=Yes N=No A=Abstain

*=Not Present for Vote

# UNITED STATES ELECTION ASSISTANCE COMMISSION

## RESOLUTION 2005-01

## CONTINUING AUTHORIZATION OF THE TECHNICAL GUIDELINES DEVELOPMENT COMMITTEE

**WHEREAS,** Section 221 of the Help America Vote Act of2002 authorized establishment of the Technical Guidelines Development Committee ("TGDC") of the United States Election Assistance Commission ("EAC"); and

**WHEREAS,** TGDC, with technical assistance from the National Institute of Standards and Technology ("NIST"), has been working diligently for the past nine months to develop its initial recommendations for the Voluntary Voting System Guidelines; and

**WHEREAS,** TGDC anticipates delivering its initial recommendations to EAC on or before May 9, 2005; and

**WHEREAS,** development of a completely revised set of Voluntary Voting System Guidelines is a paramount priority for EAC; and

**WHEREAS,** EAC recognizes that additional work by TGDC and NIST is needed to develop complete and encompassing Voluntary Voting System Guidelines; and

**WHEREAS,** the Help America Vote Act is silent as to the continued function of TGDC after the delivery of its initial recommendations.

**NOW, THEREFORE, BE IT RESOLVED** that EAC acknowledges and appreciates the tireless efforts of TGDC and the staff of NIST to provide initial recommendations for the Voluntary Voting System Guidelines; and

**BE IT FURTHER RESOLVED** that the work ofTGDC and NIST is an invaluable service to this country and to our democracy and that continued service is needed to develop final Voluntary Voting System Guidelines; and

**BE IT FURTHER RESOLVED** that EAC authorizes TGDC, with the assistance of NIST, to continue its work of developing subsequent recommendations and delivering such recommendations to EAC for consideration for adoption as final Voluntary Voting System Guidelines; and

**BE IT FURTHER RESOLVED** that this TGDC is authorized to continue its work through June 23, 2006 or until such time as it is subsequently authorized by EAC; and

**BE IT FURTHER RESOLVED** that TGDC will continue as a Federal Advisory Committee to EAC and as such its duly appointed members will continue to receive reimbursements and per diem as authorized by the Help America Vote Act.

Adopted by vote of the United States Election Assistance Commission, this __ day of May, 2005 in Washington, D.C.

Chair, Gracia Hillman

Vice Chairman, Paul DeGregorio

Commissioner Ray Martinez, III

# MEMORANDUM

**TO:** MEMBERS OF THE TECHNICAL GUIDELINES DEVELOPMENT COMMITTEE

**FROM:** COMMISSIONER RAY MARTINEZ

**SUBJECT:** FURTHER DEVELOPMENT OF VOLUNTARY VOTING SYSTEM GUIDELINES

**DATE:** SEPTEMBER 29, 2005

I would like to express my sincerest appreciation to all of the members of the Technical Guidelines Development Committee (TGDC) and staff at the National Institute of Standards and Technology (NIST) for your 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, as well as to Nebraska Secretary of State John A. Gale.

The development of performance standards for our Nation's voting systems is among the most significant responsibilities of the U.S. Election Assistance Commission (EAC). As a result of the tremendous work done by NIST and the TGDC to produce the initial draft of 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 system 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 System Guidelines (VVSG) in addressing several important security concerns, including the use of wireless technology in the voting environment and guidelines for voter verified paper audit trails (VVPAT). However, additional work in the area of voting system security must be addressed, 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 system threat analysis, further development of methods for Independent Dual Verification (IDV) and better procedures for Commercial Off-The-Shelf Software (COTS) 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 contain 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 to further develop 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. **TIMELINE FOR NEXT ITERATION OF VVSG**: Finally, as to the issue of when the next iteration of voluntary voting system guidelines should be delivered to the EAC, I believe that as work is completed in each respective area (i.e., 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(s) and ultimately, can ensure 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.