

1 NIST GAITHERSBURG, MARYLAND

2 TECHNICAL GUIDELINES DEVELOPMENT COMMITTEE

3 (TGDC) MEETING

4 MONDAY, MAY 21, 2007

5 (START OF AUDIOTAPE 1, SIDE A)

6 MR. EUSTIS: -- Over on the left hand side if you
7 walk out the door and take a right and go all the way
8 down, you'll see the glass doors. That's the quickest
9 exit from the employee lounge and should there be an
10 emergency, a fire drill or some other emergency you'll
11 hear the sounds of the lights here, the strobe lights
12 will go off and you'll be well warned.

13 Preliminary matters, as usual please turn off cell
14 phones and pagers. Everyone please wear your name
15 badges at all times, both in the public and the TGDC in
16 attendance.

17 Our signers are going to be up front here, stage
18 right if you will, over on the left should you need
19 them. Please come sit up front here and we will have
20 that capability for you.

21 All right, TGDC members, unlike voting I'm going to
22 ask you yet again to identify yourself early and often.

1 This is particularly important at this meeting because
2 we are going to be approving chapter and verse if you
3 will of this document or portions thereof, and it makes
4 it much easier for Thelma and I to keep track as well as
5 the captioners who are doing the closed captioning, and
6 eventually when we go down and get the formal if you
7 will minutes of the meeting and formal transcript done.

8 So that would be really helpful. And make sure you
9 push your button and all that sort of thing.

10 So with that we will move forward and I open the
11 meeting to Dr. Jeffrey.

12 DR. JEFFREY: Thank you very much. To try to get
13 us into the right mode, this is Bill Jeffrey. So
14 welcome to the 9th plenary TGDC meeting, and again we've
15 got a lot of work ahead of us today.

16 I'd like to begin by asking us to stand for the
17 pledge of allegiance.

18 **(PLEADGE OF ALLEGIANCE)**

19 At this point I would like to ask the
20 parliamentarian, Thelma Allen to conduct the roll call.

21 MS. ALLEN: Good morning. Brit Williams,
22 Williams not attending. Wagner?

1 MR. WAGNER: Here.

2 MS. ALLEN: Wagner is here. Paul Miller?

3 MR. MILLER: Here.

4 MS. ALLEN: Paul Miller is here. Gale? Gale is
5 not attending. Mason?

6 MS. MASON: Here.

7 MS. ALLEN: Mason is present. Gannon? Gannon
8 is not here. Pearce?

9 MR. PEARCE: Here.

10 MS. ALLEN: Pearce is here. Alice Miller?
11 Alice Miller is not here. Purcell?

12 MS. PURCELL: Here.

13 MS. ALLEN: Purcell is here. Quesenbery?

14 MS. QUESENBERY: Here.

15 MS. ALLEN: Quesenbery is here. Rivest?

16 MR. RIVEST: Here.

17 MS. ALLEN: Rivest is here. Schuster? Schuster
18 is not present. Jeffrey?

19 DR. JEFFREY: Here.

20 MS. ALLEN: Jeffrey is here. We have eight in
21 attendance. We have a quorum.

1 DR. JEFFREY: Thank you very much. Also I would
2 like to welcome some of our special guests. EAC
3 Commissioner, Denita Davidson, Executive Director Tom
4 Wilkey who I saw somewhere here this morning. There you
5 are. And Brian Hancock from the EAC. So thank you very
6 much. We will be hearing some comments from
7 Commissioner Davidson and Brian Hancock in a few
8 moments. You are always welcome so thank you for
9 attending.

10 MR. EUSTIS: Someone just joined us on line.
11 Could I see a member on the teleconference line?

12 MR. WILLIAMS: This is Brit Williams.

13 MR. EUSTIS: Brit, thank you. We just started.

14 DR. JEFFREY: So at this time I would like to
15 entertain a motion to adopt the agenda for today's
16 meeting. Is there a motion to adopt the agenda?

17 FEMALE SPEAKER: I move.

18 FEMALE SPEAKER: So moved.

19 DR. JEFFREY: Okay, there is a motion and move to
20 second and it's seconded. I'll ask for unanimous
21 consent. Any objections to adoption by unanimous

1 consent? Hearing no objection it is adopted by
2 unanimous consent.

3 Also I would like to entertain a motion to adopt
4 the minutes from the last meeting. Is there a motion to
5 adopt?

6 MALE SPEAKER: So moved.

7 DR. JEFFREY: Okay, there's a motion, Seconded?

8 MALE SPEAKER: Second.

9 DR. JEFFREY: Okay, any objections to the
10 unanimous consent? Hearing none the minutes from the
11 last meeting are adopted.

12 As I said we've got a lot of work ahead of us over
13 the next two days. We're going to be going through a
14 substantial amount of work that's been done. A lot of
15 the work has been done since the last meeting as well
16 and hopefully we will be adopting much of the material
17 and clearly identifying that material that is still to
18 be adopted for recommendation.

19 At this point I would like to introduce the EAC
20 Commissioner, Denita Davidson to the podium to say a few
21 words.

1 COMMISSIONER DAVIDSON: Thank you very much. I
2 will be very brief. I just want to say how much we
3 appreciate your being here, your willingness, your time,
4 and your commitment as we move further in this project.

5 So I want to say thanks again, and introduce Brian
6 Hancock. Many of you have shown interest in our
7 management guidelines so we're going to spend our time
8 this morning kind of bringing you up to date.

9 So Brian, all the time is yours. I'm turning it
10 over to you.

11 MR. HANCOCK: Thank you. Thank you Chair
12 Davidson, Dr. Jeffrey, TGDC members.

13 We're very happy to be able to share with you this
14 morning a very brief overview of our management
15 guideline documents that we've been working on for the
16 past year or so and will continue to work on for
17 probably at least another year.

18 The long term goal of this project is to provide a
19 complete set of election management guidelines, a
20 complement if you will to the VVSG, consolidating to one
21 document to assist state and local election

1 administrators to effectively manage and administer the
2 election process.

3 The EAC does expect the full and complete set of
4 management guidelines to be completed by the end of
5 2008.

6 Because of the urgency for resources to assist
7 election officials, the election management guidelines
8 has been divided into subject matter modules so that the
9 chapters on specific and particular topics can be
10 completed on a priority basis and distributed to the
11 election community at the time they're completed.

12 In addition, the project team has developed what
13 have become known as the Quick Start guides for each of
14 the major chapters of this document. These guides are
15 pamphlets that distil the crucial information and
16 concepts from the full document into an easy to carry
17 and easy to use format.

18 Last year we came out with four of the Quick Start
19 guides and I have these here for folks to look at if
20 they wish, and certainly they are all available, all of
21 this material is available on the EAC's website at

1 www.eac.gov or we can send hard copies to you just by
2 contacting the EAC at 202-566-3100.

3 Again, last year we came out with a Quick Start
4 guide for poll workers, one for ballot preparation and
5 logic and accuracy testing, one for voting system
6 physical security, and one on managing new voting
7 systems.

8 Just in the past several weeks, a binder containing
9 the first chapters of the full document has been sent to
10 all of the election officials throughout the country.
11 We're aware that they've gotten them and so far they
12 seem to be very pleased. We'll be adding probably ten
13 to 12 additional chapters to this document over the next
14 several years.

15 I should say that over the last 18 months or the
16 so, the EAC has had the privilege of working with our
17 project co-leaders, Connie Schmidt and Brit Williams, to
18 make these documents a reality.

19 The real authors of the documents however are the
20 election officials who educated and assisted us by
21 providing information and innovative and successful
22 election management practices.

1 The group includes at least 11 state level election
2 directors, over 35 local election officials from 19
3 different states, and representatives from NIST, NASED,
4 ACKRIOT, the election center, and the EAC Standards
5 Board and Board of Advisors.

6 Without the contributions of these individuals the
7 management guidelines could not have been produced.

8 These guidelines do not endorse one method of
9 election administration over another and they are not
10 intended as a one size fits all document.

11 In fact one of the challenges we have seen in
12 developing these things are to make the management
13 guidelines specific enough to be used and to be
14 effective in the jurisdictions but without being so
15 specific as to cause the election officials in the
16 states to have to change it drastically to fit with
17 their specific election law.

18 State and local jurisdictions are not required to
19 consider or implement the recommendations or practices
20 contained in the election management guidelines.

1 These guidelines are solely designed to serve as a
2 source of information for election officials and not as
3 requirements by which they must abide.

4 In 2007, the election management guidelines staff
5 will be working on developing the next chapters of the
6 document and new Quick Start management guides.

7 Topics for this year's chapters include military
8 and overseas voting, voting by mail and absentee voting,
9 contingency of disaster planning, ballot design,
10 developing an audit trail, acceptance testing and pre-
11 election logic and accuracy testing and parallel
12 testing, and polling place and vote center management.

13 The next series of the Quick Start pamphlets will
14 cover certification, developing an audit trail, public
15 relations and press relations, contingency and disaster
16 planning, and dealing with change of management in an
17 election office.

18 In addition to these topics, the election
19 management guidelines staff will work with the EAC's
20 language accessibility program staff to develop a
21 chapter and Quick Start guides on the use of languages

1 including non-written languages. This chapter in the
2 Quick Starts are in the queue for early next year.

3 Election management guidelines staff will once
4 again work with state and local officials in small
5 informal working groups to develop the upcoming chapters
6 and Quick Starts.

7 This format has greatly facilitated the development
8 of our materials by allowing exchange of election
9 practices across jurisdictions to incorporate best
10 practices and lessons learned in our final product.

11 The EAC has already conducted meetings on polling
12 place vote center management, and absentee and vote by
13 mail, and contingency and disaster planning.

14 And the next round of working group sessions will
15 take place in July of this year.

16 In addition to state and local election officials,
17 election management guidelines staff will closely work
18 with the EAC research department to incorporate
19 information gathered through its current collections of
20 information regarding uniform and overseas voters,
21 absentee and vote by mail practices, alternative voting
22 methods, and our ballot design project that is currently

1 up on our website, done by Design for Democracy. If you
2 have a chance, there's an interactive forum currently
3 taking place.

4 Our Standards Board members are being allowed to
5 comment on the Design for Democracy document and the
6 comments can be seen by the public. You can log in
7 there, and in addition the comments from the Standards
8 Board will be shown.

9 That is a very quick rundown on what we are doing
10 for our management guidelines project.

11 I thank you for allowing us to give you this very
12 short presentation and if you have any questions I'd be
13 happy to answer those.

14 DR. JEFFREY: Thank you, Brian. Any questions?

15 MR. PEARCE: Thank you, Brian. This is Philip
16 Pearce. One question I do have, as you went through the
17 list of people and organizations that are working with
18 you on these management guidelines, where have you
19 included the input about accessibility in the management
20 guidelines? It would seem to me that could be a pretty
21 important element to include in all of the areas that
22 you're working on.

1 MR. HANCOCK: Oh, absolutely. In fact we have
2 been talking with David Bokweiss and others at the
3 Access Board and we will be seeking their input for
4 those chapters that deal specifically with accessibility
5 issues, as well as the broader accessibility community
6 and not just election officials.

7 DR. JEFFREY: Anything else? Thank you Brian,
8 that's great.

9 MR. EUSTIS: Dr. Jeffrey, could we just check.
10 Someone came on line and I just want to see, do we have
11 another TGDC member on line who has joined us?

12 MS. MILLER: Good morning, this is Alice.

13 MR. EUSTIS: Thank you, Alice. It's Alice Miller
14 present.

15 DR. JEFFREY: Thank you. I would like to also
16 say, which I should have mentioned at the beginning,
17 that because of the timeframes for this meeting we're
18 not going to be opening up for public comments of this
19 meeting but all of the draft material is on the website,
20 vote.nist.gov and I strongly encourage you to look at
21 that material and to provide input and comments. We do
22 take those inputs very seriously.

1 At this point I would like to welcome Mr. Mark
2 Skall of NIST to discuss some of the activities since
3 the last meeting and where we stand. For the committee
4 members, you should have copies of the briefing in the
5 three ring binder. If not, we'll get that. Thanks.

6 MR. SKALL: Good morning. This morning I would
7 like to give you an update on the activities the NIST
8 team has been pursuing since the last TGDC meeting.

9 So since the March 22nd and 23rd meeting, we've of
10 course have done a lot of continued research and
11 drafting the VVSG, coordination with the TGDC. I'd like
12 to also speak about what the focus of the meeting as far
13 as we're concerned should be today and tomorrow, and
14 talk a little bit about the strategy for the meeting and
15 agenda.

16 So we've doing a lot research and development for
17 the next VVSG, of course divided up into three areas,
18 HFP, CRT and STS.

19 In HFP we've been doing some --

20 DR. JEFFREY: Mark, for some of our guests in the
21 audience, could you spell out some of the acronyms?

1 MR. SKALL: Is this a test? HFP is Human
2 Factors and Privacy. CRT is Core Requirements and
3 Testing, and STS is Security and Transparency
4 Subcommittee. So one has an S and one doesn't.

5 So for the HFP subcommittee, we've been doing
6 continued research and usability performance benchmarks,
7 continued updates to the usability and accessibility
8 requirements, and broadening of the read back
9 requirement language. This of course is the read back
10 of the paper records for people with disabilities.

11 Core requirement and testing, much research on
12 reliability and accuracy benchmarks. Those of you
13 recall from the last meeting, there was a vote to move
14 away from the mean time between failure benchmark for
15 reliability so we've come up with a new set of
16 benchmarks. You'll hear about that.

17 We've also been doing research on final updates to
18 EMC and quality requirements.

19 The STS committee has been very, very busy and
20 there are many chapters in the security area, updates to
21 access control audit, crypto electronic and paper
22 records, set up validation and logging.

1 There is also a bit of new material in STS. There
2 are four or five chapters on new requirements and
3 communications documentation, physical security and
4 system integrity management.

5 We've re-visited the previous decision. The STS
6 committee has really come upon a new strategy for
7 externally network e-poll books and you'll hear about
8 that, and continued discussion of open-ended
9 vulnerability testing.

10 So we have of course done this in very close
11 coordination with the TGDC. There have been 23 telecoms
12 since the last meeting, revisions and updates to much of
13 the draft material, and of course many individual
14 discussions with TGDC members.

15 The VVSG draft so far is over 750 pages. It is
16 formatted now. Of course the real value of a standard
17 is not the paper it's printed on but the implementation
18 of the standard.

19 The standard in essence is a means to an end.
20 What's very important is to get correct and unambiguous
21 implementations so we have to be very precise in writing

1 the standard. There has to be a lot of detailed
2 requirements.

3 That having been said, we also have worked with
4 experts in the field to try to make this as readable as
5 possible.

6 We know there's a wide audience of people that
7 really want to see this and read it besides
8 implementers. In fact just last week Bill Jeffrey was
9 testifying in an EAC public meeting and there were two
10 voting officials on the panel, the Chair of the
11 Standards Board and the Chair of the Advisory Board, and
12 they also were very much concerned in getting a VVSG
13 that is readable and as Bill so aptly said, we've really
14 tried to make this as readable as possible although I
15 think his quote was it's not going to read like great
16 literature and of course I guess that depends on one's
17 perspective and how much literature they've read.

18 So it has to be precise, it has to be detailed, but
19 we're really trying as much as possible to make it as
20 readable as possible as well.

21 We're waiting for usability performance benchmarks.
22 That's one of the things that we do not have right here

1 at this meeting. So material still needs to be
2 harmonized, some introductory and overview material
3 needs to be written, and final technical and editing
4 will probably require about three weeks. So we feel
5 we're about 95 percent complete right now.

6 So the aim of this meeting is really to get as much
7 approval of all the material that we and the TGDC feel
8 is complete as possible. At least we feel it's going to
9 be the last face to face meeting, so we need as much
10 approval of all the material that everyone agrees upon
11 as we possibly can get now so we can move ahead and try
12 to meet the July deadline.

13 So the overall aims again are to approve the
14 material and give final editing instructions to NIST,
15 and secondly to decide how to approve the remaining new
16 material.

17 So the strategy for the presentations, day one,
18 subcommittee presentations will provide summaries of all
19 materials by each subcommittee, discussion of new or
20 updated material, this is material that's changed since
21 the last TGDC meeting, and then final approval,
22 discussions, and resolutions.

1 Day two, the presentations will continue and next
2 steps will be discussed, future telecoms for discussing
3 and approving the material will be discussed, and again
4 steps toward the delivery of the draft VVSG to the EAC.

5 So the presentations you'll hear coming up and
6 first, an overview of the draft VVSG and final editing
7 issues by John Wack. Then the CRT presentations which
8 will include a summary, a discussion of the benchmarks
9 that have been developed, the review of the CRT changes
10 since the previous draft, and a vote to approve the CRT
11 section.

12 Human factors and privacy, a summary overview,
13 review of the HFP changes from the previous draft,
14 proposed change to resolution 01-07, which is the read
15 back resolution, update on usability performance
16 benchmarks numbers, and again a vote to approve that
17 material.

18 Tomorrow if we're on schedule, and right now we're
19 about a half hour ahead of schedule so maybe we'll
20 hopefully compress some of this agenda, but the way it's
21 scheduled now, tomorrow will be security transparency

1 subcommittee, a summary overview, discussion on e-poll
2 books and external connectivity.

3 Again review of the STS changes from the previous
4 draft and the new material that STS has developed,
5 presentation on that, and a vote to approve it, and then
6 finally editing instructions and discussion on the next
7 step.

8 So with that I'll conclude and introduce John Wack,
9 unless there are any questions. Okay, thank you. John.

10 MR. WACK: Good morning. Okay, we were ahead
11 of schedule.

12 **(LAUGHTER)**

13 Well, good morning again, and it's always a
14 privilege to be able to present and thank you all for
15 being here. I hope your flights were good coming in.

16 The pollen count is extremely high here. I don't
17 know if any of you are affected by that, but I don't
18 know if I'm woozy just because we're at the end of this
19 project, or it's just the incredible amount of pollen in
20 the air.

21 Okay, let me go over things here. I have kind of a
22 short presentation just to go over some basic issues of

1 where we are with the documents production, what's left
2 to do. Mark already mentioned a little bit about how
3 this meeting is supposed to flow but I thought I'd go
4 over that a little bit too.

5 Let me get to the next slide here. I'll start
6 right in with how we're going to do presentations. I'm
7 going to do a very high level overview of the document
8 and each subcommittee is going to go into more detail.

9 We'll start out with more of an overview of the
10 material and really the most significant material, and
11 not focus so much on the actual words written in the
12 VVSG but more what are the significant issues, what are
13 the big changes, things of that sort.

14 Then we will probably talk about some changes in
15 some areas and we'll ask for approval of the material,
16 you know, of course with edits probably. Those of you
17 who remember basically voting for VVSG 2005 or approving
18 VVSG 2005, remember that we had a number of edits but we
19 noted them down and we had to live up to them.

20 We have a lot of material really to go through and
21 if I had my way we could have kind of lubricated this
22 with some really fine champagne and really fine wine but

1 this being the government, I think we've got some
2 portable defibrillators over there. If you really have
3 trouble let us know.

4 But anyway, we've got all this material and I'd
5 like to end up with two stacks of material by the end of
6 the day and essentially one stack, hopefully it will
7 reach to the sky, will be all the approved material and
8 as I said, that may have edits, some changes, and then
9 we've also got some new material that we have yet to
10 discuss and we will likely discuss that in telecoms
11 between now and the end of our schedule.

12 We'll also ask for a resolution at the end to have
13 NIST go and make final changes to a lot of this
14 material.

15 What is and what is not in the draft, Mark went
16 over that. Usability requirements; need the final
17 numbers, otherwise HFP, that whole area is largely
18 complete and well done.

19 Some new security material, and I'll get into this
20 a little bit more in a minute, some requirements need
21 more technical editing and proper scoping.

1 What we don't really have so much yet is
2 introductory material, and I want to mention that the
3 VVSG doesn't need to have a ton of introductory
4 material.

5 It needs to have good solid introductory material
6 and overviews of how best one can use the document and
7 understand the document, but outside of the VVSG it
8 would be probably a good idea to have a good overview of
9 the significant issues in the VVSG, something that's
10 written more for all audiences. I think that would be a
11 useful thing.

12 At this point let me see if I can figure out how --
13 could you man the controls there and bring up the actual
14 PDF of the -- you see it down there on the task bar.
15 Great, and I think I can do a few things here. I'm not
16 sure why this isn't working real well but anyway, that's
17 largely the document there and I was just at the
18 introduction.

19 So we do have more introductory material to go but
20 right now we've started on -- I hope I don't make you
21 dizzy scrolling through this. We do have a number of
22 changes. Right now they're kind of plopped in there.

1 They'll be better organized. There's a lot of new
2 material, a lot of significance to new issues so we'll
3 go through that.

4 And then let me get to my next slide here. As you
5 know already, this introductory volume really is
6 basically for all readers but it's also a guide for how
7 to use the document, and then volume two of course is
8 definitions and glossary.

9 Volume three, the product standard is really where
10 the meat of most device requirements are. Most
11 equipment requirements are in volume three.

12 Volume four is standards on data to be provided. I
13 battled Acrobat and I couldn't get that bookmark to line
14 up properly, but anyway that's volume five, the testing
15 standard.

16 And I'll go here to introduction, to general
17 testing approaches, and basically each requirement has a
18 test reference field which points to the type of testing
19 that will be done to actually test the requirement.

20 And if I can move this around a little bit here,
21 the conformance clause is good reading actually. That's
22 really where you need to start with this document and

1 that talks about normative versus informative language,
2 what a voting system is, what an implementation
3 statement shall include, a number of things.

4 It gets to our infamous class structure and when I
5 talk about requirements still needing some final
6 scoping, that means that we have to essentially say in
7 the requirement what device does it apply to, and since
8 like an optical scanner inherence requirements from
9 program device and so on and so forth, that scoping is
10 important and in some cases still needs to be done.

11 We do need to do some technical editing just to
12 make the language more understandable. And we didn't
13 start off really being experts in plain language but
14 it's become increasingly obvious that it's extremely
15 important to have a very usable understandable document.

16 So putting down requirements that are good
17 requirements is important but also the way in which they
18 are communicated to the audience I think is perhaps
19 another 50 percent of the battle.

20 So we do have a good technical editor and we have
21 some good production people working with us, so with the
22 material that we get through today and tomorrow we'll

1 actually start doing some things with the language and
2 saying things in a more straight forward way in cases
3 where we don't right now.

4 I should say that we have taken pains already to
5 make the material understandable and do our best in that
6 area but we could always do better.

7 Anything else that's worth mentioning here? A
8 couple of other things briefly. We have the material
9 organized in this particular manner you see before you
10 right now, which is a number of security chapters. The
11 general requirements are really CRT requirements,
12 basically core requirements, requirements by voting
13 activity.

14 HFP is right up here, usability, accessibility and
15 privacy requirements. We may try to combine some of the
16 security chapters, at least those chapters that relate
17 more to each other and that will help in some way.

18 So once we're done with the meetings here, we'll be
19 doing some rewriting, making some edits. We'll be doing
20 our own end to end reviews within NIST and scoping the
21 requirements correctly, standardizing on glossary terms.

1 The document we end up with will have a lot of
2 cross-references. All glossary terms will be cross-
3 referenced and we'll make sure other references are done
4 properly.

5 And we want to produce a high quality PDF too. I
6 think it's important to produce something that's very
7 navigable, that people can get through fairly easily.
8 Even if you're not a vendor or a tester, if you don't
9 have much technical knowledge, at least if we have a
10 navigable PDF you'll be able to find what you need
11 rather quickly.

12 I don't think I have anything else to say at this
13 point about the document other than that we just
14 basically have document structure things to do at this
15 point and edits from today.

16 Are there any questions, any concerns or issues any
17 of you have over things? Nothing, nothing at all? Wow.

18 Well we're ahead of schedule and I think that's
19 probably a good thing because we do have a lot of
20 material. I'm not sure if the CRT folks were ready to
21 stand up and take charge but I'll hand it over to them
22 at this point. Let me see if I can cue that up for you.

1 Okay, well thank you very much. One final parting
2 shot is, what we're doing is we're ending up with a
3 document that we will deliver to the EAC. So this is
4 really stage one and it goes out for a public review.

5 And maybe a mistake I made along the way was I
6 thought this had to be a highly polished final product,
7 you know, with pristine language and everything, and to
8 the extent that we can make it that way, that's good,
9 but it still needs to go out for a public review.

10 And in a sense it's okay if it's tailored a little
11 bit for a public review, if it has the equivalent of
12 little yellow sticky notes in it that identify areas of
13 concern or areas that you want people to look at more
14 thoroughly, or if the TGDC has any instructions that
15 would assist in the public review, you know, it's okay
16 to do that.

17 I'm telling myself this, this doesn't have to be a
18 perfect document at this point. It's just the best job
19 we could do right now.

20 A year from now we may find out that there are some
21 advances in technology that change the way we think
22 about certain requirements now but I think we have to

1 put something out that is ready to be reviewed by the
2 general public. So we leave it at that.

3 DR. JEFFREY: John, if I can just echo some of
4 that. Obviously this is just the first step. The next
5 step is the public review, which will be a pretty
6 extensive public review, and though I'm sure we think
7 that we've got everything exactly perfect and made all
8 the right tradeoffs, we certainly would expect probably
9 a lot of public comment on this and we look forward to
10 that. So I echo that.

11 You made a statement at the beginning that you
12 thought it would benefit from having maybe another
13 introductory document, probably independent actually of
14 the VVSG that steri-strips all the technical and just
15 explains almost to the general public. Is that what you
16 were thinking of, what the changes are?

17 MR. WACK: I think so. I think that something
18 that would give a comprehensive statement of what's in
19 the document but do it in a way that's understandable to
20 most audiences, would talk about major differences
21 between this document and VVSG 2005 in certain areas.

1 This is where the TGDC could weigh in if there were
2 pros and cons to some issues and why one particular
3 approach was chosen.

4 There are a number of things that could go into
5 this introduction but I think it would be easier to do
6 this separate from the VVSG itself, but I think it's a
7 very good idea to do it.

8 MS. QUESENBERY: Hi, Whitney Quesenbery. You
9 said something just now that made me turn my light on,
10 which was it's okay for this to go out with notes and
11 comments and in-completions in the document.

12 MR. WACK: Oh, I probably wasn't clear there.
13 Not in-completions but it has to go out I think most
14 importantly such that it can be understood well enough
15 that if someone provides a comment, they're commenting
16 on the right thing and I think that the explanations of
17 things have to be right on.

18 If there were additional factors, and again why a
19 certain approach was taken, or if we want to put
20 additional language in there in the discussion fields
21 that says this really means this, or anything else that
22 would aid in the public review I think it's a good idea,

1 but I'm not suggesting that we do anything of the sort
2 of approving incomplete material or anything of that.

3 I just think that what I'm really saying is we
4 don't have to deliver kind of the final version of the
5 novel at this point. We do have to deliver something
6 though that will be clearly understood so that people
7 can accurately comment on it. I see now you're looking
8 a little troubled.

9 MS. QUESENBERRY: I am looking a little troubled.
10 I mean I must say that it's very easy when you read this
11 to see where the staff has been able to go back and
12 really work on clarifying the language, and it seems to
13 me that where that's been done, both the preamble
14 explanations and the discussion explanations are both
15 places where this material is already there.

16 So I just want to make sure that what you're
17 talking about is continuing that work and clarifying the
18 document as we're looking at it rather than some whole
19 new thing, and that if there's kind of, we'd like to
20 draw your attention to the following sections, that
21 would go in the document that's sort of outside of the

1 standard document that you just referred to. Just make
2 sure we're on the same page.

3 MR. WACK: Okay, sure.

4 DR. JEFFREY: This is Bill Jeffrey. I actually
5 agree with that, look for within the TGDC, within the
6 VVSG itself, be looking for comments outside of what's
7 been through the approval process.

8 But if there is some top level white paper that
9 comes with it that can reference both white papers that
10 were generated during this process to provide additional
11 background, or pointers, or areas of discussion that's
12 outside the detailed scope, I don't think you're
13 recommending that we're changing the format or structure
14 of this. And there is a positive affirmation by the
15 nodding of the head.

16 MR. WACK: Yeah, and also in a number of cases
17 with some requirements, we tried to provide references
18 to where the requirement came from so at least those
19 people who had been following the standards for a while
20 kind of know the genesis of the requirement.

21 Well with that, I thank you very much and I'll turn
22 the stage over David Flater.

1 MR. FLATER: Thank you, John. Good morning. I'm
2 going to dive right in to discussing where the changes
3 have occurred since the previous meeting, which is with
4 regards to the unfinished benchmark discussion.

5 To review what is a benchmark, a benchmark is a
6 quantitative point of reference to which the measure of
7 performance of a system was devised, may be compared.

8 What this means is we're talking about the numbers
9 that appear in the requirements for reliability, also
10 known as failure rate, accuracy, also known as error
11 rate, and the rate of miss-feeds.

12 Now one point that was confusing both during and
13 after the last meeting was what the expectations for the
14 benchmarking are.

15 Conformity assessment for these benchmarks target
16 random events, random failures, random errors, and
17 random miss-feeds. And although it may collect non-
18 random events, by which I mean those that are traceable
19 to design flaws and logic faults, those kind of faults
20 should be found first by other kinds of testing in the
21 test campaign, such as functional testing.

1 So if we have the kind of failure that is easily
2 repeatable and reproducible, you set up the following
3 ballot style and it fails every time, this is the sort
4 of thing we ought to find during functional testing. So
5 for the benchmarking the assumptions are different.
6 Although we may collect some of these non-random
7 failures by accident, this is really a defense in depth
8 approach to the testing.

9 Now the general guidance was received at the March
10 meeting. First was that yes indeed, the old benchmarks
11 deserved a review and revision, however the plan that
12 was being followed for determining new benchmarks was
13 not getting us there very quickly.

14 So we agreed to switch to plan B, which consisted
15 of getting some "back of napkin" estimates of volume
16 tolerance for failures, et cetera, use those to divide
17 benchmarks in the correct order of magnitude, and supply
18 a complete record of the reasoning that is used to
19 justify those new benchmarks.

20 Two specific items were also received. First of
21 all, that any failure that results in one ballot

1 becoming unrecoverable is unacceptable. We cannot
2 disenfranchise voters, no excuses.

3 The second was with regards to the one in ten
4 million benchmarks for accuracy, one of two benchmarks
5 for accuracy appearing in VVSG -05, generally there was
6 a thumbs down on that particular number because it
7 seemed arbitrary and possibly unattainable by paper
8 based systems.

9 Now the reliability benchmark is defined in terms
10 of failure rate and it's important to understand exactly
11 what is considered a failure and what is not.

12 There is a carefully written definition of failure
13 in the glossary but the requirement for that definition
14 was that it provide the ability to perform arbitration
15 during conformity assessment when there's an argument
16 about whether something is or is not a failure.

17 A more plain language description is given after
18 the normative text, which explains that failures are
19 equipment breakdowns, including software crashes such
20 that continued use without service or replacement is
21 worrisome to impossible.

1 Normal routine occurrences like running out of
2 paper are not considered failures, neither are miss-
3 feeds of ballots because there is a separate benchmark
4 specifically for miss-feeding paper into paper based
5 devices.

6 So for the revision of reliability benchmark, one
7 of our NASSID representatives, Paul Miller, provided
8 estimates of volume tolerance to failures et cetera,
9 based on a scenario involving a medium size county in a
10 western state.

11 These estimates were reviewed by other election
12 officials and then reliability benchmarks were derived
13 from them based on a one percent risk of exceeding the
14 tolerances.

15 There was however a special case made for the
16 unrecoverable ballots, also known as disenfranchisement.
17 This benchmark per the specific advice received was set
18 at zero.

19 There may be some testability concerns raised about
20 this on the grounds that it is not demonstrable, it
21 doesn't matter how long you test, you can never have any

1 more of the zero percent confidence that the requirement
2 is satisfied.

3 However it suffices that the requirement is
4 falsifiable, meaning if in fact you get one of these
5 failures during conformity assessment you can fail the
6 system. It's not an acceptable behavior. So the
7 requirement has value even though it is not
8 demonstrable, the higher level of testability.

9 Now the reasoning justifying the reliability
10 benchmark is incorporated in a draft in volume three, in
11 a section called hardware and software performance
12 general requirements, and it is followed by a subsection
13 that's more technical explaining the derivation using
14 the one percent risk.

15 I should also note that what was a single benchmark
16 for reliability expressed in terms of time has now been
17 broken down into a table of benchmarks expressed in
18 terms of volume and also in terms of the severity of the
19 failure. Generally they've been separated into user
20 serviceable failures versus non-user serviceable
21 failures to address some of the concerns that election

1 officials had trying to lump all these together into one
2 benchmark.

3 For accuracy, the metric being used for accuracy is
4 now report total error rate instead of a ballot position
5 error rate which essentially means that if a reported
6 total is wrong, it's a least one error has occurred.

7 Another point of confusion that occurred at the
8 last meeting was about the definition of accuracy with
9 respect to human factors. Accuracy here for this
10 benchmark is not using the human factor meaning of
11 accuracy. This is strictly a measure of mechanical
12 performance. It's not a measure of voter intent.

13 The point at which we start to get concerned with
14 this benchmark is when we have a good input to the
15 system, we want to insure that the output agrees with
16 the input. So bad inputs would be thrown out from this
17 benchmark.

18 Revised accuracy benchmark is derived from what was
19 called the maximum acceptable error rate. The lower
20 test benchmark in VVSG -05, which was a ballot position
21 error rate of one in half a million.

1 This was in fact the rate that the test in VVSG -05
2 attempted to demonstrate, whereas the one in ten million
3 rate was simply an artifact of the probability ratio
4 sequential test, the need for an upper benchmark to
5 structure the test.

6 The previous benchmark was converted from a ballot
7 position error rate to report total error rate using the
8 "back of napkin" numbers that we acquired as part of the
9 scenario that I discussed earlier.

10 The last of the three benchmarks is for miss-feeds
11 and we have defined miss-feeds to include multiple feeds
12 of paper-based ballots, jams of paper ballots, and
13 rejections of paper ballots that meet all vendor
14 specifications.

15 In the previous standard different of these were
16 addressed in different places in the document and they
17 have now been combined into a single benchmark which are
18 treated collectively as miss-feeds.

19 This is separate from the reliability benchmark --
20 (Tape interrupted when changing sides)

21 **(END OF AUDIOTAPE 1, SIDE A)**

22 * * * * *

1 (START OF AUDIOTAPE 1, SIDE B)

2 MR. FLATER: -- And part of the input that we
3 received in this round of revisions, it has now been set
4 at one in 500.

5 A new issue was raised with this just this morning,
6 which is that as written the text only applies to paper
7 based tabulators.

8 In fact there is also the possibility to have miss-
9 feeds on an electronically assisted ballot marker. Even
10 though it's not counting the ballots, this is still a
11 mode of failure that you can have with an EBM that the
12 ballot jams every time you feed it into the EBM.

13 So the revision that I would suggest to address
14 that is to change the scope of the miss-feed requirement
15 to include EBMs, and I believe that that requirement
16 would also have to be moved into the general section
17 because it's no longer specifically during the counting
18 part of the process. I believe the effect of that
19 change would simply be to extend this miss-feed rate to
20 include the process of feeding paper ballots into EBMs.

21 MS. QUESENBERRY: David, this is Whitney. Just
22 to help us follow, when you guys know the section number

1 that we're talking about, could you just throw that in
2 as you go forward so that we can find it quickly in the
3 book? This is section 17.8.4.

4 MR. FLATER: I apologize. At the time that these
5 slides were finalized I had no idea what the section
6 would be.

7 **(LAUGHTER)**

8 MS. QUESENBERRY: I know.

9 MR. FLATER: David Wagner is looking at me
10 quizzedly.

11 MR. WAGNER: Is this a good time to ask a
12 question?

13 MR. FLATER: Sure.

14 MR. WAGNER: Dave Wagner. Question about the
15 accuracy. Can you just explain the intent of the
16 accuracy measure? I understand this isn't the human
17 factors, we're not trying to capture human factors here,
18 but for instance for a paper based system if you had a
19 marginal mark that was read one way by your mechanical
20 scanner but if the human were to review would say oh,
21 yes, the intent is something else, is that an error for
22 the purposes of the accuracy measure?

1 MR. FLATER: No, it is not because the behavior
2 with respect to marginal marks is a completely separate
3 issue. This applies to non-marginal marks, marginal
4 marks that while not perfect in the sense of completely
5 filled the oval instructions to voter, are still well
6 within the range of what vendors document as being
7 reliably readable.

8 MR. WAGNER: So the idea is, if what the vendor
9 documents as reliably readable, if you ever do find one
10 of these differing interpretations for a mark that the
11 vendor documents is reliably readable, then that is an
12 error, is that the idea?

13 MR. FLATER: If it is documented as being
14 reliably readable and it does not read in a repeatable
15 and reproducible fashion, that is a problem, that is an
16 error.

17 MR. WAGNER: Let me continue a little bit more
18 though. Repeatable and reproducible is different from
19 correct.

20 MR. FLATER: Okay, so we have two sorts of marks.
21 We have votes and non-votes. If something is within the
22 documented description for what constitutes reliably

1 readable vote, and it should repeatably and reproducibly
2 read as a vote and similar discussion for non-votes,
3 marks that are below the marginal range should reliably,
4 repeatably, and reproducibly count as non-votes.

5 And then the behavior in the marginal range is a
6 separate issue that in general wherever possible, i.e.
7 in the precinct count case, if the ballot is fed that
8 contains a marginal mark that is ambiguous, it should be
9 given back with advice to the voter that hey, you might
10 want to fix this because we don't know how it's going to
11 read or at least it's not going to repeatably and
12 reproducibly count the way you think it will.

13 MR. WAGNER: Thank you.

14 MALE SPEAKER: David I've got a question. If I
15 remember correctly from the discussion last time, part
16 of the reason of going back to the "back of the napkin"
17 calculation has to do with the implications on the
18 volume of the testing that would be required under the
19 one to ten million scenario that was in the old
20 versions.

21 Can you say something about what the implications
22 would be for how one would test to these new levels?

1 MR. FLATER: Okay, I'm forced to go to my extra
2 slide.

3 **(LAUGHTER)**

4 The accuracy test, closest thing to a volume test
5 that existed in VVSG-05 required that a minimum of
6 approximately one and a half million ballot positions be
7 counted, but allowing that this volume could be a
8 simulated volume on DRE, meaning that it isn't all being
9 entered through a ten finger interface.

10 Looking at the ramifications of the changes for
11 optical scanners, the volume that is required by a
12 volume test that is specified in volume 500, functional
13 testing requires a minimum of 75,000 ballots.

14 That adjustable perimeter did not come out of the
15 discussion of benchmarks but was in fact carried forward
16 from an acceptance test in 1990. Most of the other
17 perimeters for the volume test came from the California
18 volume reliability testing protocol but that protocol
19 did not address optical scanner volume.

20 So using that number of 75,000 ballots to make a
21 comparison with the amount of volume that was previously

1 tested, we somehow need to relate ballots to the number
2 of ballot positions.

3 Doing this, using our "back of napkin" estimates
4 for how many ballot positions for ballots et cetera, we
5 get one and a half million votes or six million ballot
6 positions.

7 So given our margin of error here, which is in
8 order of magnitude on our estimates, one could
9 humorously observe that these numbers are effectively
10 equal, that the old and new numbers, but our best
11 guesstimate here is that we will have at least as much
12 volume for optical scanners as was previously required
13 and probably more.

14 DREs are a different story. The notion that we
15 would be able to get one and a half million ballot
16 positions and do a ten finger interface is talking about
17 a very big test indeed with a lot of people.

18 The protocol that is specified is again from the
19 California volume reliability testing protocol which
20 means that we will have less volume but it will not be
21 simulated volume, and I can't recall the name exactly

1 but someone once said that one flight test is worth a
2 thousand simulations.

3 Here we'll be using less but more valid data as
4 opposed to a large amount of data in which we have less
5 confidence what it's doing, and test to the system. And
6 EBMs are tested like DREs.

7 Does that answer the question?

8 FEMALE SPEAKER: David, are EBMs tested only
9 like DREs or sort of like DREs plus opt scan, that is
10 are the ballots produced also tested?

11 MR. FLATER: Of course. I mean you have a system
12 that includes both the EBM and the optical scanner, but
13 the EBM devices themselves would be operated like DREs
14 in terms of the volume produced.

15 DR. JEFFREY: This is Bill Jeffrey. So in a
16 nutshell at least on the optical scan, the bottom line
17 is we ended up close to original within your error bars.
18 We ended up at the same result as existed in history but
19 now we can actually defend why that number makes sense
20 as opposed to what we previously had called an arbitrary
21 number. So a lot of work to get to the same spot, is
22 that a fair assessment?

1 MR. FLATER: I don't think we really are at the
2 same spot but you could view it that way.

3 **(LAUGHTER)**

4 It's half empty, not half full, right.

5 So now I'll go into the review of CRT changes
6 overall. Relative to the previous meeting, although
7 there were many edits, in my assessment these edits were
8 primarily to make the language more precise rather than
9 to change the intent of the requirements, and I will not
10 spend several hours it would require to review all
11 those.

12 One, you could call it an editorial change with
13 impact, something that I said would help a long time
14 ago. What has finally happened was that the
15 requirements of the form, election officials shall ...
16 that don't belong in the product standard have in fact
17 been changed to informative assumptions, explaining that
18 in fact what's happening here is we are explaining that
19 the product requirements, the requirements only
20 equipment, have been written on the assumption that
21 these procedures will be followed and if we couldn't

1 make that assumption, we couldn't make an effective
2 product standard.

3 So we no longer have the green text saying election
4 officials shall. It's explained in each place that
5 these are just assumptions that we've made.

6 Substantive changes that have been made recently
7 include adding a few more classes to the class diagrams
8 in the conformance clause and also there is a subsection
9 at the conformance clause regarding the innovation class
10 and that discussion would have to happen under the
11 auspices of the security and transparency presentation.

12 There is also one other notable change and in fact
13 requirement to address concerns about the durability of
14 paper. Concerns have been raised with the number of
15 paper records that are now being produced that if poor
16 quality paper is used it will not survive the amount of
17 handling that's required to conduct audit recounts, et
18 cetera.

19 So to address that there's now appointed a
20 government paper specification standard, which I believe
21 a great deal of the commercially available paper out
22 there now already conforms to these standards as a

1 matter of course, and it's simply the paper that isn't
2 going to withstand handling will now be excluded.

3 Finally for my part of the presentation, a summary
4 of the major changes that have been made since VVSG-05
5 across all of the CRT material.

6 Terminology standards have been refocused to
7 provide well-formed terminology for the VVSG.
8 Documentation requirements, which used to be mixed in
9 with the product standard have now been separated out
10 into volume four, standards on data to be provided.

11 Voting variations by which we mean things like
12 straight party voting, ranked order voting, et cetera
13 have been defined. There are classes in the conformance
14 clause for them. There are requirements saying what the
15 system must do if it is claimed that these voting
16 variations are supported.

17 Requirements now have identifiers attached to them
18 explicitly. In the previous standards you sort of had
19 to manufacture a requirement using the section number
20 and if there was an A, B, or C, you would cite that but
21 now each requirement actually has a number attached to
22 it.

1 The applicability of the requirements has been
2 specified when it applies to a field that cites specific
3 systems or device classes to which the requirement
4 applies.

5 The benchmarks and related test methods have been
6 revised as previously discussed.

7 The coding conventions have been refocused on
8 integrity, and transparency, and conventions that were
9 primarily stylistic in nature which were suffering rapid
10 obsolescence as the state of the art evolves, have been
11 taken out of the spec with simply a reference to the use
12 of published and credible coding conventions.

13 Concepts related to commercially off the shelf
14 software and things that operate like it, like widely
15 used open source software or freeware, have been better
16 defined and border cases software that is sort of like
17 (unintelligible), but is in fact customized on each
18 deployment. These borderline cases are now handled by
19 the new definitions.

20 The requirements on optical scanners have been
21 clarified and strengthened. The reporting requirements
22 that appeared slightly different in more than one place

1 in the old standard have now been put in one place and
2 clarified.

3 There is now a logic model giving definitions that
4 mathematically specify what an over vote is, what an
5 under vote is, et cetera, and these are used during the
6 logic verifications portion of conformity assessment to
7 insure that these fundamentals have been correctly
8 implemented.

9 There is now a volume test specified similar to
10 California volume reliability testing protocol.

11 Changes have been made as necessary to make the
12 standard consistent with current law, policy, and
13 technology such as the appearance of electronically
14 assisted ballot markers on the scene.

15 And finally redundant and problematic requirements
16 have simply been removed.

17 Now my colleague Alan Goldfine will be discussing
18 some additional portions of CRT work, covering what was
19 called environmental testing, and shake and bake testing
20 in the old standard.

21 But I can take any questions on this set of changes now
22 if there are any.

1 DR. JEFFREY: Any questions for David?

2 FEMALE SPEAKER: Where's the volume testing
3 requirement, because it really would help if someone
4 could follow along and get us section numbers so we can
5 look at this?

6 MR. FLATER: Volume five, chapter five I think.
7 It's the section that includes structural testing,
8 functional testing. The volume test is under functional
9 testing. Is it 5.2? 5.2.

10 DR. JEFFREY: If I could ask someone from NIST as
11 we go through the briefings to actually have a copy and
12 be able to identify the sections that would help. If
13 you don't have a copy I'll lend you mine. Okay, thanks
14 David.

15 MR. GOLDFINE: Thanks, I'm Alan Goldfine. I'm
16 going to complete the discussion or the review of the
17 CRT changes, in particular in the areas of quality
18 assurance, configuration management, and EMC,
19 electromagnetic compatibility.

20 Okay, reviewing once again the quality assurance
21 configuration management revision.

1 MALE SPEAKER: Alan, just for people to find, that
2 is volume four, chapter two.

3 MR. GOLDFINE: Yeah, as a matter of fact if I get
4 to the next slide I have it in there. Okay, that's
5 fine.

6 Okay, once again this is a response to the TGDC
7 resolution 3005 which mandated a reconsideration of
8 these areas, and the statement of direction at the
9 December 2006 TGDC plenary stating that the ISO 9000,
10 9001 standards really should provide the framework for
11 new VVSG requirements dealing with quality assurance and
12 in keeping with the current emphasis on pointing to
13 appropriate chapters.

14 What this means is that volume one, section eight
15 and nine, and volume two, section seven in the 2005 VVSG
16 is being replaced in the new VVSG by volume three,
17 section 16.4.2, at least that's what it was in what I
18 think was distributed to the TGDC. That's a bit of a
19 moving target, the particular section numbers. Volume
20 four, chapter two and volume five, section 4.4.

21 Now since the last plenary we revised the
22 requirement dealing with the timing of the vendor

1 deliverable of a quality manual per instructions from
2 the TGDC. There was a bit of a discussion on that.

3 That change or that decision was incorporated into
4 the requirement, and since then based on CRT comments,
5 we've clarified and sharpened the informative text
6 surrounding the requirements and finally as you see,
7 incorporated the requirements from the white paper into
8 the draft VVSG.

9 Now in the second area, electromagnetic
10 compatibility, the goal here was to update the 2005 VVSG
11 requirements to reflect the latest available
12 information, to reference applicable standards rather
13 than repeating or excerpting text from these standards,
14 and to clearly separate requirements from testing
15 specifications.

16 These were all based on observations of the 2005
17 text, which didn't totally do this in a clear fashion.
18 So the latest in what we've done, the latest standards
19 are referenced and so on.

20 Looking at it from the section perspective, within
21 the 2005 VVSG volume one, sections 4.1.2.4 through
22 4.1.2.12, and part of section 12 dealing with

1 telecommunications, and volume two, section 4.8 are now
2 replaced by what is in the new VVSG, volume three,
3 sections 16.3.3 through 16.3.5, and volume five,
4 sections 5.1.1 through 5.1.3.

5 Since the last plenary, you know, again, not a
6 whole lot is new under the sun, we've completed the
7 requirements in all of the three categories, conducted
8 immunity, radiated immunity, and telecommunications
9 immunity, discussed these requirements at CRT meetings,
10 made final edits to the informative text, and again,
11 incorporated the requirements into the draft VVSG from
12 the white papers.

13 Now at this point I should have a slide saying
14 discussion but somehow that got overlooked, but let's
15 picture a virtual slide saying discussion at this point.

16 **(LAUGHTER)**

17 DR. JEFFREY: Thank you. Any questions or
18 comments on the CRT? This is the final CRT briefing?

19 MALE SPEAKER: Yes.

20 DR. JEFFREY: Any questions or comments at all on
21 the CRT section?

1 MALE SPEAKER: Would it be possible to get a list
2 of the sections that have not yet been approved by the
3 TGDC or that have changed since they were approved the
4 TGDC to give us a chance to go review just specifically
5 those new or changed material?

6 MALE SPEAKER: Well there's sort of a mixed bag
7 here. For example, in the stuff that I have been
8 talking about, at the last TGDC meeting the material was
9 still in white paper form. It was in requirements. I
10 mean they were there. The text is the same as what it
11 is now but it was in white paper form and it was
12 approved in the context of white paper.

13 What's happened since then, you know, a few
14 additional things, is that that text has been
15 incorporated, physically stitched into the VVSG document
16 and I think it's summarized in the slides which sections
17 are those.

18 MR. WAGNER: Dave Wagner again. So that's great.
19 So taking all of the things that were approved as white
20 papers off the table, I could repeat my question. I
21 thought you did a great job of that in your talk of

1 doing that for the quality management parts. Do we have
2 a similar list for the other parts of the CRT work?

3 MALE SPEAKER: Dave, if you want to get up -- but I
4 believe that all the CRT material that David presented
5 has been discussed at previous meetings and has been
6 voted on, and if there are changes I think they are more
7 in presentation or minor wording but let me ask Dave to
8 --

9 FEMALE SPEAKER: John, actually can I ask a
10 slightly different question that might be easier to
11 answer which is just to be clear about which chapters of
12 which volumes are covered?

13 I know there are some cross fertilization among the
14 committees but just before Bill Jeffrey's asks the next
15 question he's going to ask --

16 DR. JEFFREY: I'm not going to ask that question.
17 What I am going to ask is that as we do a 15 minute
18 break, if the CRT folks could actually go back, identify
19 the actual sections, and before I ask the question that
20 Whitney thinks I'm going to ask, is that you then come
21 back right after the break and highlight -- for example
22 David, when you talked about -- you know, basically

1 David, you quickly go through your briefing again and
2 say, okay, this is section whatever. We got the
3 substance of the briefing but just saying this slide
4 refers to the following section.

5 MS. QUESENBERRY: For example, volume three,
6 chapter 16 and 17 are pretty much entirely CRT and I
7 think at that level, not at the detail requirement
8 level. We're talking about this chapter, and this
9 chapter, and this chapter and were we approving those so
10 we're clear on what we're doing.

11 MALE SPEAKER: The one thing that I'm not sure of
12 is you were previously talking about things that have
13 not been approved at previous TGDC meetings.

14 My belief was that at this point we want a blanket
15 approval as opposed to just approving the benchmarks
16 which was where the -- I mean in the sections I talked
17 about, the benchmarks are the only part where there is
18 something that was substantively changed since the last
19 TGDC meeting and needed to be reviewed by the whole
20 committee, but what we're doing here I believe is voting
21 on the whole pile of paper. So the direction I'm

1 getting during the break is to just list all the CRT
2 sections.

3 DR. JEFFREY: Actually I think for CRT sections,
4 let's be very explicit what it is, and so when we come
5 back after the break let's have up on the screen exactly
6 which sections, which chapters, whatever that we're
7 talking about and make it absolutely unambiguous.

8 Any other questions before we break? Okay, having
9 said that, let's come back at 10:30 a.m. on the dot.
10 Thanks.

11 **(BREAK)**

12 DR. JEFFREY: Okay, if I could everybody please
13 take your seats. We're about to get started. And for
14 the NIST folks, this will be part of your performance
15 plan if you don't sit down.

16 **(LAUGHTER)**

17 Okay, let me just review for a second the process
18 that we're going to follow. Because so many of the
19 sections that we're discussing are done by the
20 subcommittee and those subcommittee sections are
21 interspersed throughout the entire document, it's very
22 difficult to understand the tangled web of all of this

1 as we're going through that. So each of the speakers
2 will try to be more specific as to the sections that are
3 being referred to.

4 And what we're going to do is hold off any votes on
5 the approval of the document until tomorrow so that this
6 gives, and this is Secretary Gale's excellent
7 suggestion, so that we can tonight, once we've got all
8 of the briefings today, and hopefully we'll get through
9 the STS section today, we'll then see the whole thing
10 and that will give us the opportunity then to not worry
11 about which section is in which piece, and then discuss
12 the voting tomorrow on the approvals.

13 So unless there's any objections to that, I think
14 that it is a more coherent way for us to be looking at
15 the material.

16 Okay, with that if you could go back and look at
17 some of the sections.

18 MR. WACK: Okay, we're going to switch between
19 computers. The big screen is meant for you to see, the
20 navigation panel is for David to go through and we can
21 switch between PCs and we'll try to do it that way. Let
22 us know if that doesn't work or we can do it a different

1 way, but this is the way we'll try to identify the
2 material we're talking about.

3 MR. FLATER: We can do it either way. I think it
4 might be sufficient for me just to keep this one up and
5 walk through it.

6 I'm going to attempt to identify all of the CRT
7 sections for what that's worth.

8 First of all the entire of volume two terminology
9 standard, although this is overarching all of the
10 subgroups that have some input here, I have been the
11 point of contact for the maintenance of the terminology
12 standard so that is technically classified as CRT
13 material.

14 In volume three, chapter two, the conformance
15 clause also has a CRT point of contact.

16 Chapter 16, general requirements is maintained by
17 CRT. This chapter contains the benchmarks for
18 reliability and accuracy and will shortly contain the
19 benchmark for rate of NIST fees. And in fact I'll
20 highlight section 16.3 which is where the benchmarks
21 themselves are imbedded.

1 Chapter 17, requirements by voting activity also
2 contains CRT requirements that are organized according
3 to the voting process.

4 Finally Chapter 18, reference models, 18.1 through
5 18.3, specifically the process model, the vote capture
6 device state model and the logic model are maintained by
7 CRT. 18.4 role model is maintained by the security and
8 transparency subcommittee.

9 At present the entirety of volume four, standards
10 on data to be provided would be included under the CRT
11 umbrella, understanding that documentation requirements
12 from the other two subcommittees are likely to be
13 harmonized and integrated with this material as the
14 editorial process continues and concludes.

15 Volume five, testing standard is much the same.
16 There are a few subsections here that belong to other
17 subgroups but most of this is CRT material.

18 My understanding under chapter three, introduction
19 of general testing approaches, is that the section
20 currently labeled vulnerability testing is going to be
21 rewritten by the security and transparency subcommittee.

1 Under documentation and design review, there are
2 also some references to other subcommittee work that is
3 yet to be integrated.

4 Similarly under test methods, there is a reference
5 to performance based usability testing and open-ended
6 vulnerability testing to be integrated from other
7 subgroups.

8 There is a noteworthy omission from what the
9 material is in volume five here. The shake and bake
10 tests that were supposed to have been carried over with
11 only minor revisions from the previous standard were
12 dropped inadvertently from this volume, but there is a
13 series of tests like bench handling test, temperature
14 variation test, there's a non-operating test for
15 humidity that's specified in the old standard. We were
16 talking about adding an operating test for this batch of
17 material.

18 The intent is to carry it over with minor revisions
19 from VVSG-05 but it does not appear in the draft that
20 you have.

21 I believe that covers it. Volume six is overhead.
22 Volume six contains bibliographical references from CRT

1 sections and other sections that have yet to be edited
2 together. For what it's worth, the first section of
3 references here were contributed from CRT.

4 DR. JEFFREY: Thank you very much, David. That
5 really does help a lot so I appreciate that.

6 MR. FLATER: In case you haven't found it, at the
7 end of six if it's useful to you in reviewing, there's
8 also a summary of requirements organized by section. So
9 let's get to line three. Okay, so there you can start
10 to look at sections such as in the conformance clause,
11 there is the implementation statement in section 2.5 and
12 that is the requirement there. So if that's useful to
13 you as well, it's at the end of volume six.

14 DR. JEFFREY: Okay, thank you. Okay, with that
15 I'd like to actually get back on the agenda on the human
16 factors and privacy and ask Sharon Laskowski to come on
17 up.

18 MS. QUWSENBERRY: While Sharon is getting ready,
19 this is almost entirely in volume three, chapter three.

20 MS. LASKOWSKI: Good morning , everyone. So
21 I'm going to be talking about the progress since the

1 last meeting on the human factors and privacy, as
2 Whitney said, chapter three.

3 I'll review the HFP changes from the previous draft
4 that we saw. I've got a one-page summary of significant
5 changes from the VVSG 2005, and then I'll give you a
6 progress report on the usability benchmark development.

7 So there are 13 significant changes since the March
8 plenary and a whole bunch of little edits, which I
9 didn't feel we needed to go over.

10 We felt that it was important to emphasize privacy
11 because that's an overarching goal of these systems.
12 And it was kind of buried in the usability section so we
13 included privacy in the section title now so that its
14 usability, (unintelligible) and privacy requirements, to
15 call that out, and we moved the privacy section up to
16 3.2.3

17 Next item, we had been playing with possibly having
18 a human assistance performance, that is the ability to
19 vote without human assistance in the performance
20 requirements.

21 It's been there for a long time and as we thought
22 about it we said, well we are capturing as part of the

1 usability benchmark testing just in terms of number of
2 errors, ability to complete without assistance and we
3 felt in thinking about this further that there's a lot
4 of variability and that it would be difficult to
5 actually come up with a benchmark that would be
6 meaningful and so we dropped that particular benchmark.

7 We split the vendor test reporting into two
8 requirements, conducting the test and documenting the
9 results.

10 So for example, and recall that there is a bunch of
11 these under different conditions for both usability and
12 access ability. 3.2.1.2-A is usability testing by
13 vendor for general population and that now says in our
14 section, the vendor shall conduct substantive usability
15 tests on the voting system using individuals
16 representative of a general population. See the
17 requirement in volume four for the associated reporting
18 requirement.

19 Volume four is a technical data package, which
20 states all the requirements for the vendor to provide in
21 terms of documentation. So in volume four we have the
22 vendor's held document of the usability testing

1 performed as required in section three, and report the
2 test results using the common industry format, just to
3 be consistent with how all the documentation is being
4 reported.

5 Whitney, your light's on. Do you have a question?

6 MS. QUESENBERRY: No.

7 MS. LASKOWSKI: We added a past ballot
8 notification. This looks different than my slides. Did
9 you get the most recent versions of my slides on here?
10 Is this the one I sent Friday afternoon? So I hope the
11 rest are okay.

12 The past ballot notification is a moving target so
13 this has been undergoing some changes currently, but the
14 discussion with CRT is how much in terms of whether the
15 ballot was cast successfully or not would be included,
16 should be mandated in terms of error reporting.

17 So I'm not sure I'm prepared to discuss this in
18 detail because as I said it's a moving target. What
19 we're talking about is requirements such as okay, the
20 voter should be notified when their cast ballot is
21 accepted, but we also started talking about over the
22 weekend that perhaps the voter should be notified as to

1 what kind of message to expect when they hit the cast
2 ballot button, so that if they don't see that then they
3 know something is wrong.

4 This is partly to kind of reflect various casting
5 failures, but often if you've got a catastrophic failure
6 you wouldn't be able to get that reported so I think
7 that we're going to continue to iterate on this one.

8 MS. QUESENBERRY: This is Whitney. What you're
9 working on is clarifications for specific types of
10 systems that would go under here basically? So a D1 and
11 a D2.

12 MS. LASKOWSKI: Well, there are actually a
13 couple for a DRE. For example, we had some sample
14 wording. If the ballot's not cast successfully
15 including the storage of the ballot, (unintelligible) of
16 DRE shall notify the voter and provide instructions as
17 to the steps the voter should take to cast his or her
18 ballot. So we're working on stuff like this but it's a
19 moving target right now.

20 MS. QUESENBERRY: But it's clarification and
21 elaboration of the specific intent here.

1 MS. LASKOWSKI: Yes. Now I'm hoping that the
2 rest of my slides reflect the rest. Okay, that one
3 looks correct. Maybe I didn't hit save on that last one
4 when I sent it to you.

5 So once we started talking about voter
6 verifications and durable human records for software
7 independence, we then looked back at the scope visible
8 records that the voter sees because now not only is the
9 voter looking at the ballot, there may be another
10 durable human record that they're looking at.

11 So we revisited that and broadened the scope, and
12 the scope was broadened in four requirements. So for
13 visual privacy, the ballot and any other visible record
14 containing ballot information and any control shall be
15 visible only to the voter during the voting session.

16 General support for alternative languages, so that
17 was broadened, not just from the ballot but to vote
18 verification records.

19 For ballot submission and vote verification, if the
20 voting station supports ballot submission and we added
21 on vote certification for non-blind voters, then it

1 shall also provide features that enable voters who are
2 blind to perform these actions.

3 And finally for the dexterity ballot submission and
4 vote verification, we included in addition to ballot
5 submission, vote verification.

6 MALE SPEAKER: A question.

7 MS. LASKOWSKI: Yes.

8 MALE SPEAKER: Are these provisions for the
9 accessible voting station or for all voting stations?

10 MS. LASKOWSKI: ` Let's see, the first two, 3.2.3
11 and 3.27 are in the usability section, and the 3.33-E
12 and 4-C are in the accessibility section. We can tell
13 that because section 2 is usability and section 3.3 is
14 accessibility.

15 FEMALE SPEAKER: And we're sure you memorized
16 the entire book.

17 MS. LASKOWSKI: I'm sorry, I should have
18 pointed that out when I --

19 FEMALE SPEAKER: And just to clarify, one of the
20 points here was not to have to repeat all of this in the
21 VVPR section but simply to be able to pick up the

1 general statement of VVPR that all normal requirements
2 apply, and now we've been clear about it?

3 MS. LASKOWSKI: Yes, this is the more elegant
4 way to do it.

5 We clarified some wording in the requirement for
6 completeness of instructions. We changed voting system
7 to voting station, which shall provide instructions for
8 all its valid operations. That means that the station
9 itself has to in some way have those instructions right
10 at hand as the voter is voting.

11 I think I got the numbers right on this one. We
12 had a VVPAT requirement in the --

13 FEMALE SPEAKER: The last one was 324, not 323
14 in completeness of instructions, 324 not 323.

15 MS. LASKOWSKI: Oh, thank you. We moved some
16 sections around, right. Lots of numbers to juggle.
17 Thank you.

18 So the original VDPPAT and the usability section,
19 visual access to VVPAT is that when the voting system
20 asks a voter to compare two distinct records, those
21 records shall be positioned so as to be easily viewable
22 and legible from the same posture.

1 There's now a VVPR section, 6.3, so 6.3.4-B is ease
2 of record comparison which I believe is what the
3 original VVPAT, visual access amounts to, and that is
4 the format and presentation of the paper, and electronic
5 summaries of ballot selection shall be designated to
6 facilitate the voters rapid and accurate comparison.

7 Remove that question. You do have an older version
8 of the slides. There must have been a mix up.

9 I wasn't intending to talk about that. We like the
10 second wording and that was just a note to myself. Any
11 questions? My question may elicit some further
12 questions.

13 MALE SPEAKER: Well I think I've raised this before
14 but just to put this on the record, I like to make the
15 point that I think that probably what's more important
16 here is to enable the voter to compare what's on those
17 records to the voter's intent to make sure that is how
18 the voter intended rather than necessarily allowing
19 comparison of the paper and the electronic summary at
20 the same time.

21 MS. LASKOWSKI: Any discussion?

1 MS. QUENESBERY: This is Whitney. It seems to
2 me that if the VVPR is the ballot, then all that matters
3 is the voter's intent because that's the thing that will
4 be counted.

5 But if the first count is going to be made off the
6 electronic record, and the VVPR is a duplicate record of
7 that record, then you really do have to see not only
8 that what's on the VVPR is right, but that what's on the
9 VVPR matches because while we --

10 (Tape interrupted while changing tapes)

11 **(END OF AUDIOTAPE 1, SIDE B)**

12 * * * * *

13 **(START OF AUDIOTAPE 2, SIDE A)**

14 MR. WILLIAMS: This is Brit Williams. Can you hear
15 me?

16 DR. JEFFREY: Go ahead, Brit.

17 MR. WILLIAMS: I think we should leave the wording
18 the way it is. The important thing here is that the two
19 records agree. It's up to the voter to determine
20 whether or not they both reflect its intent and there's
21 no way in the standard we can determine what the voter's

1 intent is so I think the wording should stay the way it
2 is.

3 MR. WAGNER: Dave Wagner. I'm just going to
4 still disagree. I think that we should not have a
5 requirement in the standard that would forbid a system -
6 - if we had a voting system that made it easy to check
7 that the electronic record was correct and then
8 separately to check that the paper record was correct, I
9 think that should be satisfactory and should be allowed
10 to pass under -- shouldn't be prohibited .

11 So right now we have a little bit of strategic
12 ambiguity in the language and if the ambiguity was
13 intentional to permit flexibility in the system so that
14 kind of system should be permitted, then I think
15 sticking with the current language is fine.

16 On the other hand if this was a little bit of
17 strategic ambiguity that was intended to prohibit that
18 but to be a little subtle about the fact that we're
19 prohibiting it, then maybe that's not so great.

20 MS. QUESENBERRY: This is Whitney. I would say
21 that what we're interested in is there being able to
22 compare them. If they do that sequentially that's fine.

1 If they do them by having them side-by-side, that's
2 fine, but that they actually be able to tell the
3 difference between them if there are differences.

4 MR. WAGNER: Dave Wagner. So then I think that
5 would not match what I would recommend. I would
6 recommend that if we have a voting system that allows
7 the voter to in step one compare that the electronic
8 summary matches their intent, in step two, compare that
9 the paper summary matches their intent, but never to at
10 any point makes it particularly easy to compare the
11 electronic record against the paper record, that should
12 be acceptable.

13 MR. WILLIAMS: This is Brit again. Surely when the
14 voter looks at that record of his vote, he's going to
15 decide whether or not it matches his intent and if it
16 doesn't match his intent he's going to call the poll
17 worker over and point out that there's some error.

18 What they're talking about here is something that
19 has to do with later auditing. Those two records have
20 got to match or they're no good for later auditing
21 purposes.

1 MS. QUESENBERRY: I think I disagree with you
2 David. I mean if the whole point is to have a paper
3 record that allows us to do a kind of in line audit of
4 the operation of the electronic machine, at least on
5 screen, obviously we don't know what happens behind the
6 screen, but at least at the screen level, then its got
7 to be --

8 Also I'd point out that while it may be easy for
9 some people to read and scan something very quickly,
10 it's not easy for everyone to do that and that when we
11 start thinking about ranges of cognitive disabilities
12 that we're really kind of -- that one of the easiest
13 things to do is to compare two things if they're laid
14 out well as opposed to see one remember it, see another
15 one remember it.

16 MR. WAGNER: Well I'll let this be the last word
17 and then I'll allow us to continue.

18 I think there is a fundamental misunderstanding of
19 the intent of the voter verified paper record. The
20 intent of such a record is not to allow an in line audit
21 or do comparison during the day, and it's not a
22 particularly useful step to do. The intent I think

1 should be to allow audits after the election to insure
2 that we're counting the votes correctly.

3 So again, my response to Brit Williams would be to
4 say it is important that the machine be designed so that
5 if it's working correctly it prints the same thing on
6 the paper that it showed in the summary screen, no
7 question about that.

8 I would also say it's important that from a
9 usability perspective, the machine be designed to
10 facilitate rapid and accurate checking that each of
11 those records matches the voter intent.

12 But I don't think what we need is from a usability
13 point of view to make it -- I don't think it's crucial
14 to make it really easy and rapid to compare the paper
15 against the electronic summary screen because that is
16 just not necessary for the security or the reliability
17 benefits of the VVPR. It's sufficient for the machine
18 to be designed such that if it's working correctly, then
19 those two will always match. So thanks for the chance
20 to provide input.

21 DR. JEFFREY: Rather than having the issue dangle,
22 reach some closure there, if you had specific language

1 that you would like to see modified, I'd suggest a
2 resolution to that if you think there should be an
3 additional requirement that's not captured that we need
4 to think about that.

5 So again, we've got time today to think about that,
6 but either we should reach closure on the issue or not.
7 So I don't know if you're satisfied or backing off or
8 what, but at some point let's think about a resolution
9 if you want to actually put it on the table. Sharon.

10 MS. LASKOWSKI: And we can certainly think
11 about this a little bit more.

12 Dr. Jeffrey, I have a question for you. Given that
13 I've already found two indications that this is an
14 earlier version of my slides, I suspect that the end
15 slides as projected here are not going to be accurate.

16 So there are two options. When we get to that
17 point we can postpone say the usability benchmark
18 discussion until say after lunch and let security start,
19 or we can use the hard copy, which is accurate. I don't
20 have it with me. Oh, you have --

21 MALE SPEAKER: If you want to give me that I'll
22 replace it.

1 MS. LASKOWSKI: Let's do that, thank you.

2 DR. JEFFREY: Sounds like a good plan.

3 MS. LASKOWSKI: Hopefully that was the right
4 version too as well.

5 DR. JEFFREY: Were there hard copies? Are we the
6 only members that --

7 MALE SPEAKER: The hard copy and the version on the
8 Internet is correct.

9 DR. JEFFREY: Okay, but are there hard copies
10 available to the audience?

11 MALE SPEAKER: The audience does not have copies of
12 this presentation so they're going to take what's on the
13 screen. The Internet audience has the right
14 presentation.

15 MS. LASKOWSKI: And I apologize for the mix up.

16 MR. WILLIAMS: What do we have on our records?

17 MALE SPEAKER: Brit, I believe the ones you have, I
18 referred you to the Internet site and so you have the
19 correct version.

20 MR. WILLIAMS: Thank you.

21 MALE SPEAKER: Perhaps while we're playing with
22 files I could speak to the issue that David raised.

1 While I understand and sympathize with the motivational
2 -- I am actually comfortable with the language the way
3 HFP proposed it.

4 In terms of the architectures we've seen, I don't
5 see any architectures there where it seems like it would
6 be helpful to have a sequential kind of thing.

7 So if there was an architecture where it does seem
8 like this was a good idea and we really would like to
9 have those kind of sequential comparisons -- but the
10 architectures we have, the parallel comparison I think
11 is doable in most cases and really does help improve the
12 accuracy for the after the proposed audit so I would
13 support just leaving it the way HFP proposed it.

14 MALE SPEAKER: Actually I'll kind of follow up on
15 that with a question for you. How do you see the EBM
16 devices working in relationship to this requirement?

17 MALE SPEAKER: So this means you have to have the
18 screen and the paper available at the same time. Is
19 that problematic or --

20 MALE SPEAKER: I think that could potentially be
21 problematic. You could easily envision building an
22 electronic ballot marking system where what's showing on

1 the screen is only showing while the paper is inserted
2 to preserve the privacy of the voter so that once the
3 ballot has been printed and removed from the ballot
4 marking device it's no longer showing on the screen. So
5 this could actually have an impact.

6 MR. WILLIAMS: The way this has worked, I think
7 that would prohibit what you just described. It's going
8 to have to show on the screen while the voter has that
9 paper record in their hand otherwise you can't meet this
10 requirement.

11 MR. WAGNER: Dave Wagner. I would agree with you
12 there and I think I am arguing that it's not clear to me
13 that that is a positive impact of this requirement, that
14 that seems like it could be a negative consequence.

15 MS. QUESENBERRY: This is Whitney. I think one
16 possibility here is to say that if the system presents
17 the two at the same time, like you've got the paper
18 behind glass next to the screen, that they need to be
19 designed to facilitate comparison.

20 We've taken the words posture out because that
21 seemed very limiting, but one of the concerns was that

1 you could if you wanted to, go back and forth and it
2 would not prohibit you from doing that.

3 DR. JEFFREY: Bill Jeffrey. Again I see this
4 dangling issue out there. Okay, so I'll ask for
5 somebody to keep track of this issue so that we don't
6 drop it at the end. So that there may be a rewording or
7 clarification on this point.

8 Okay, with that, we're back up and technologically
9 ready here, so Sharon.

10 MS. LASKOWSKI: Yes, so this is the most recent
11 version. I apologize for the mix up, last minute, it
12 happens.

13 So we had talked about trying to include some
14 usability for poll workers as much as possible and so
15 the visual scope now includes poll workers.

16 So for a minimum font size, which is in the
17 usability section, we've added not just for voters but
18 for poll workers as well, and the contrast ratio for
19 anything the poll workers need to look at is the same as
20 for the voters.

21 We've clarified the accidental activation
22 requirement with a discussion. The requirement is that

1 input mechanisms shall be designed to minimize
2 accidental activation.

3 And by accidental activation there are at least two
4 kinds. One is when a voter is kind of brushing,
5 exploring across the screen and is overly sensitive to
6 touch so they accidentally make choices they didn't
7 intend to.

8 The second issue is the problem if you've got a
9 control in a location where it can easily be activated
10 unintentionally. For example, a voter might be holding
11 on to the bottom a DRE screen and there is a button
12 there and they accidentally activate it with their
13 thumb. So again, just added discussion to make that
14 clear.

15 In the intro to the accessibility subsection we
16 emphasized that the usability subsection applies to all
17 the accessible voting stations as well.

18 So I'll read this. This is the intro against the
19 accessibility and it covers only those features that are
20 unique to the accessible voting station. For instance,
21 an audio interface would be of interest mainly to those

1 with vision or other reading disabilities, not to those
2 who can use a visual interface.

3 The preceding subsection 3.2, general usability
4 requirements, covers the features that are applicable to
5 systems for both the general population and the voters
6 with disabilities.

7 Those requirements apply to all voting systems
8 including accessible voting systems. Therefore to
9 determine what features are required of the accessible
10 voting station one must examine both subsections.

11 So for example, two font sizes is a universally
12 usability requirement but it's certainly helpful for
13 people with visual disabilities so you've got to be
14 cognizant of that.

15 We clarified our end-to-end accessibility
16 requirement and had some suggested wording at the last
17 plenary. We've revised it.

18 The accessible voting system stations shall be
19 integrated into the vendors complete voting system so as
20 to support accessibility for disabled voters throughout
21 the voting session, and in particular a sub-requirement
22 is that the vendor shall supply documentation that's

1 with the recommended procedures that fully implement
2 accessibility for voters with disabilities and how their
3 station supports those procedures.

4 So we would imagine in the test methods, which we
5 haven't developed yet, is that there would be a
6 simulation part with users, a walk through for each of
7 the disabilities to see if indeed there was
8 accessibility throughout the voting session.

9 FEMALE SPEAKER: As specified by the vendor.

10 MS. LASKOWSKI: As the vendor specifies,
11 correct.

12 Okay, we've got proposed new wording for low
13 vision. It applies to all systems using paper. It's
14 currently a should. I guess I should magnify that a
15 little.

16 MS. QUESENBERRY: To be clear for everyone, this
17 is in the general usability section. It's moving from
18 section 33 to section 32.

19 MS. LASKOWSKI: Okay, we've got new wording for
20 legibility of paper ballots and verification records,
21 and let me point out that we've revisited this again,
22 partly because we were looking at the paper record, the

1 durable paper record again, but we realized that this is
2 sort of across the border.

3 We need to pay attention to low vision because it's
4 a very large population of people, most of which will
5 tend to be certainly the aging population who will tend
6 to use the regular voting station not the accessible
7 one.

8 We also have some requirements about legibility by
9 font size and legibility by magnification.

10 So let me go through the new wording. For
11 legibility, of paper ballots and verification records,
12 all voting systems using paper ballots or paper
13 verification records shall provide features that assist
14 in the reading of such ballots and records by voters
15 with low vision.

16 And we add in our discussion that while this
17 requirement is satisfied by one of its sub-requirements,
18 other innovative solutions are not precluded.

19 Sub-requirement legibility by font size. The
20 system may achieve legibility of paper records by
21 supporting the printing of those records in at least two
22 font sizes. This was a should previously because we

1 didn't want to necessarily mandate how paper ballots
2 might be supplied and we were looking at just the
3 equipment, but by raising up the requirement one level,
4 this allows us to then suggest ways you can achieve low
5 vision of paper.

6 And the other sub-requirement is legibility by
7 magnification, so this is new. The system may have --
8 because we didn't specifically call this out. We had it
9 in discussion as a suggested technique before.

10 The system may achieve legibility of paper records
11 by supporting magnification of those records. This
12 magnification may be done by optical or electronic
13 devices, the vendor may either provide the magnifier
14 itself as part of the system or provide the make and
15 model number of readily available magnifiers that are
16 compatible with the system.

17 The magnifiers either provided or cited. Most of
18 course provide legibility for the paper as actually
19 presented on the system. For example, if the paper
20 record is under a transparent cover to prevent the voter
21 from touching it, the means of magnification must be
22 compatible with this configuration.

1 MS. QUESENBERRY: Just to be really clear, our
2 goal here is to help specify the means by which a system
3 could provide the opportunity to provide -- the reason
4 why this is not a single requirement is that election
5 practices vary so an election official might or might
6 not have chosen to or be legally required to print
7 ballots in certain ways.

8 And the other important thing about this new
9 requirement is that it's not any old magnifier, it's a
10 magnifier that's appropriate to the physical design of
11 the device.

12 So if you've got a curved screen you need to
13 specify the magnifier that is appropriate for reading a
14 curved screen and so on. It doesn't say that the
15 magnifier has to be supplied by the vendor. It could be
16 supplied by the vendor, or it could be specified as a
17 externally available device that could be purchased
18 locally.

19 MS. LASKOWSKI: Okay, and the reason I chose to
20 talk about these requirements in this part of the talk
21 is because the next slide is going to talk about the
22 rewording of the accessibility for voter verification.

1 DR. JEFFREY: Any other questions on that section
2 before we move on to the next section?

3 MR. GALE: Dr. Jeffrey, I do have a question.
4 John Gale, Nebraska. I remember our subcommittee
5 discussions on this and my recollection was that we were
6 concerned about the impact of a larger font size on
7 reel-to-reel or roll-to-roll DRE printers.

8 If you jump to a higher font sizes it would in
9 effect preclude the use of such roll-to-roll printers,
10 if I'm using the right terminology. What is the impact
11 on this language? I guess I'm concerned about this in
12 some unintended --

13 MS. LASKOWSKI: We could read it and never make
14 a decision, but our goal was to allow that as an option
15 so that you can look at -- instead of spelling out every
16 possible configuration of systems and a requirement for
17 it, to simply say the vendor and the voting official
18 together can think about the configuration of their
19 system and can provide an -- if you're using a reel-to-
20 reel system with narrow paper for instance, you might
21 choose a magnifier as opposed to large font.

1 So these are sufficient techniques, either or both
2 can meet the requirement as long as one of them is
3 present to meet the requirement.

4 MR. GALE: So you read 3.2.5-G1 is not saying
5 that each particular piece of equipment has to provide
6 both options?

7 MS. QUESENBERRY: No, it's may require.

8 MS. LASKOWSKI: It's may.

9 MS. QUESENBERRY: It's may, correct me if I'm
10 wrong, standard writers, but may means it's an option
11 that may be used, not something that must be used.

12 MALE SPEAKER: That is correct.

13 MS. QUESENBERRY: Thank you.

14 MR. GALE: So we're saying this does not impede
15 the possibility of using the roll paper on printers?

16 MS. QUESENBERRY: That was not the intent. You
17 can decide whether you think it does but that was not
18 the intent.

19 MS. LASKOWSKI: Yeah, the intent was that we
20 want the paper to be readable, to be (unintelligible)
21 enough to be readable. There are several ways you may
22 achieve that. You may think of other better ways.

1 Okay, so as I said, we had to think about low
2 vision again when we talked about accessibility for the
3 voter verification and so that sort of caused us to
4 revisit this whole issue of legibility.

5 So I wanted to put this slide in just before the
6 new wording for the accessibility of voter verification
7 because it does tie in with those as well as some other
8 requirements.

9 So we've reworded the accessibility of paper based
10 vote verification to have a larger scope so that we're
11 not just talking about one disability, we're talking
12 about accessibility across the range of disabilities as
13 identified in section 3.3, the accessibility section.

14 And there are some sub-requirements to this
15 requirement on the next slide. The new wording is, if
16 the accessible voting station generates a paper record
17 or some other durable human readable record for the
18 purpose of allowing voters to verify their ballot
19 choices, then the system shall provide a means to insure
20 that the verification record is accessible to all voters
21 with disabilities as identified in section 3.3.

1 The discussion here is important. Verification,
2 and I've just listed the critical part of the discussion
3 here, verification is part of the voting process and all
4 the other general requirements apply to verification and
5 particularly those dealing with dexterity, blindness and
6 partial vision issues such as legibility issues that we
7 just talked about.

8 So rather than just talk about audio read back, we
9 brought this up a level. That's not necessarily
10 testable so we've got a sub-requirement that is the read
11 back requirement.

12 Audio read back for paper based vote verification
13 at the accessible voting station generates a paper
14 record or some other durable human readable record for
15 the purposes of allowing voters to verify their ballot
16 choices, then the system shall provide a mechanism that
17 can read that record and generate an audio
18 representation of its contents. That's more or less
19 similar to what we had originally.

20 So again this we think is a better version than the
21 wording that was suggested in the resolution as we
22 thought about this and address a number of comments that

1 we got from a lot of sources, which are posted actually
2 at the vote.nist site as public comments.

3 MALE SPEAKER: Do we know, is low vision defined
4 somewhere? We've talked about visual impairment, we've
5 talked about blindness, we've talked about legal
6 blindness. Is partial vision a new term that we're
7 using here that we haven't used previously?

8 MS. LASKOWSKI: No, we used it in the previous
9 sections when we talked about minimum font size for
10 example back in the --

11 MALE SPEAKER: Because I remember the discussion as
12 well. Most of us wear glasses and if I take my glass
13 off I may have low vision but that doesn't mean I'm not
14 capable of putting my glasses on and that replacing any
15 need for other magnification. So are we talking about a
16 form of impaired vision that can't be corrected easily
17 with --

18 MS. LASKOWSKI: It is a very broad term because
19 there's many different kinds of vision impairments, some
20 of which would require you to use audio, some of which
21 just having some magnification available is a help if

1 you can't get corrected with glasses alone or if you
2 forgot your glasses.

3 MS. QUESENBERRY: But we are talking not
4 corrected vision.

5 MS. LASKOWSKI: Yeah.

6 MS. QUESENBERRY: Right, so I'm the same way.
7 I'm very closely legally blind without my glasses, with
8 them not.

9 MR. WILLIAMS: This is Brit Williams again. I've
10 always looked at this as a matter of voter choice. If
11 the voter thinks they have impaired vision, they have
12 impaired vision, and if they want to use say the audio
13 then we don't argue with them about that. We say okay,
14 you can use the audio.

15 MS. QUESENBERRY: Thank you Brit, that's a good
16 point. This is Whitney again. I think the other is
17 that there are specific assisted technologies that we're
18 mandating for people who are completely blind, but there
19 are other things like large font that help people who
20 are not completely blind but nonetheless have a wide
21 variety of visual problems. So high contrast for
22 example --

1 MR. WILLIAMS: We have a lot of voters that will
2 use the large font as a matter of convenience although
3 their eyes are perfectly good.

4 MS. QUESENBERRY: And the others are things like
5 contrast ratio, color saturation. There are specific
6 kinds of visual problems where changing the color makes
7 a huge difference, or having high contrast makes a huge
8 difference, but these are still all in the accessible
9 voting system. The only thing we moved up to the
10 general usability is the two font sizes.

11 MS. LASKOWSKI: And the contrast has always --

12 MS. QUESENBERRY: And that was done partly
13 because what we're seeing in the field is that systems
14 are not supporting those as technology has moved forward
15 -- so have our voting systems technologies.

16 MR. GALE: This is John Gale. I guess that was
17 my point, whether this was somewhat of an ambiguity as
18 opposed to a little more of a definitive definition,
19 because some places we say low vision, some places we
20 say partial vision. Partial vision to me is a little
21 more specific than low vision and low vision --

1 MS. LASKOWSKI: That's a good point. We should
2 check to make sure we're consistent.

3 MS. QUESENBERRY: Let's do another trial check on
4 that please.

5 MS. LASKOWSKI: Any other discussion on this
6 new wording?

7 Okay, I'll go on to the next slide then. Okay, so
8 that completes my list of 13 significant changes since
9 the last plenary.

10 This is a list of the significant changes since
11 VDSGL5. So we've now improved the usability of a VVSG
12 document. We've added plain language guidance which
13 helps with cognitive impairments. We've added of course
14 as we just discussed, accessibility voter verification
15 requirements. We've addressed low vision more fully and
16 moved it to the general usability section as a shall.
17 So font size, and contrast, and paper legibility.

18 We've generalized adjustability of any of the
19 controls to apply throughout the voting session. And
20 adjustability implying that this can be changeable at
21 any time throughout the voting session.

22 MR. WILLIAMS: Of the voter?

1 DR. JEFFREY: I'm sorry, could you repeat that,
2 please?

3 MR. WILLIAMS: Who can change it, the voter, the
4 poll worker? What if the system requires that the poll
5 worker make the change during the voting session?

6 MS. LASKOWSKI: This is adjustability by the
7 voter.

8 MS. QUESENBERRY: This is Whitney, Brit. So a
9 voter can select large font on their own that they can
10 get back to that selection screen at any time.

11 MR. WILLIAMS: Right.

12 MS. LASKOWSKI: We looked over the entire
13 chapter and any place that we could add poll worker
14 usability and broaden the scope of our requirements we
15 did so. We looked at the end-to-end accessibility and
16 made sure there was a requirement that all these
17 accessible solutions were going to work together for the
18 whole session for the voter.

19 We haven't talked about timing requirements in a
20 while but this is the time to respond to the voter,
21 giving the voter cues, when to time out, when not to

1 time out. We've discussed this I believe at the last
2 plenary in detail. That was all new.

3 We've made some progress on the performance
4 benchmarks. I'll talk about that in a moment. And we
5 changed the safety requirement to refer to the
6 underwriter's laboratory 60950.

7 And most of the other work was editing and
8 clarifications that I didn't think were significant.

9 Okay, now I'd like to talk about the progress
10 report on performance benchmarks. So last time if you
11 recall I talked about validity.

12 We tested on two different systems with 47
13 participants and we believe our test protocol is valid
14 because it did detect differences between systems and it
15 produced errors that were expected based on expert
16 review of the systems.

17 So since that time we are now looking for
18 repeatability or sometimes it's called reliability of
19 the protocol. So we've done three tests on the same
20 system and got similar results. I've had our
21 statisticians at NIST look at them. They say there are
22 only marginal differences across the median results.

1 We've done three tests. The first one was 44
2 participants, the next one was 48, the third, 48
3 participants. Age range was 25 to 54. Some college,
4 college post grad. Mostly Virginia, some D.C. and
5 Maryland folks. 60 percent women, most had voted
6 before.

7 Let me remind everyone, because this is a concept
8 that's difficult to get our heads around, and that is
9 for such a benchmark test our variable is the machine.
10 We want to control as much as we can in the testing so
11 that we see differences among performance across
12 machines.

13 So we think we have a broader range of test then
14 what we did, a broader range of demographics. I think
15 the next question is how much -- or let me go to the
16 last bullet.

17 The next question that we're going to be working on
18 but we don't need that to set the benchmark, is it
19 reproducible by labs across the country? How much
20 variability can we allow across participants in
21 different geographic regions and still get
22 reproducibility?

1 And so when we develop further test method
2 development and outlining of how these tests are
3 actually going to be performed, we're going to some
4 further experiments across different geographic regions
5 to look at how much variability is still okay for this.

6 To set the benchmark we're going to be testing four
7 systems. We've done some of that testing over the
8 weekend, and June 1st and 2nd, those are scheduled.
9 We've got the systems up and running with the
10 appropriate test ballots and have recruited test
11 participants to do so.

12 So before I go on to the next slide, let me first
13 ask, are there any questions about the work thus far of
14 what I've described?

15 Okay, so let me talk a little bit about metrics.
16 Basically what we're most interested in here is success
17 rate. So how do we propose to count success rate? With
18 our test ballot we have 28 voting opportunities for each
19 test participant.

20 The simplest way to count that is if they've got --
21 and we provide them a ballot and we tell them how we

1 expect them to vote. We say do your best to vote this
2 way. We count one if correct, zero if wrong.

3 So for a multi party race, multi candidate race, if
4 they're told to select two and we tell them which two
5 candidates to select and they get those two right, they
6 get two points. If they get one wrong by choosing
7 something else or forgetting to choose, they get a zero
8 for that particular vote, et cetera.

9 And so the machines score then for a particular
10 test is simply the mean success rate. We could have
11 looked at other counting methods like if they -- since
12 they count voting for the wrong candidate as opposed to
13 not voting in a particular race, counting voting wrong
14 as an added penalty, et cetera, but we get pretty much
15 the same kind of spread of results so we thought the
16 simplest counting method was the best.

17 We also looked at the percent of perfectly cast
18 ballots, what percent of voters in this test voted all
19 28 voting opportunities correctly. So typical result
20 from one of our tests was a mean of 92.3 percent with a
21 standard deviation of 16.3. 40 percent of the ballots
22 were cast totally correctly.

1 So the question is, we're not getting normal
2 distributions and you've got a confidence in -- how can
3 we then set the benchmark?

4 So one of the NIST statisticians Nin Fanshang has
5 worked in developing what's called a process capability
6 index, has done a lot of research in this. And if you
7 don't have a normal distribution you can still use this
8 index if you look at more than 100 participants.

9 This capability index was designed for testing a
10 process against the specification so it sounds made to
11 order for what we're trying to do here.

12 It basically is a measure that combines the
13 accuracy using this average and the standard deviation
14 together with a lower specification level to get an
15 index.

16 So basically what we can do is look at the
17 performance across a number of our machines. We
18 calculate a capability index setting the competence rate
19 we want and then we do that test, calculate the index
20 and using the standard deviation, this formula, we get
21 an interval, a competence interval that indeed this

1 system performs at this capability index within this
2 range.

3 So then we just merely check to see the benchmark
4 capability index and ask does the system, given this
5 competence info, fall within this index or above. Then
6 you pass. If that range of values fall below the
7 capability index benchmark we set, you fail.

8 So what we need to do is the next step obviously,
9 is to write a white paper with all the formulas
10 explaining this but it's a pretty simple calculation.

11 So we're pretty happy with how this has turned out
12 so far.

13 FEMALE SPEAKER: So it sounds like one of the
14 implications of it is that for the test lab vendors, for
15 the test labs, that scoring this test will be quite
16 mechanical, which is good.

17 MS. LASKOWSKI: That's correct, and one thing
18 that we want to do when we work on test methods is to
19 just provide the spreadsheet or some other software so
20 that they can just put in the data and it spits out the
21 results.

1 The prime data appears to be repeatable. I want to
2 look at some of the additional results. Typically on
3 our test ballot 641 seconds to vote, standard deviation
4 of 180, but the question here is, is it a good measure
5 of usability performance.

6 It doesn't correlate to the error rate. You've got
7 people that can cast a perfect ballot but they're very
8 careful, and other people that are sloppy and spend a
9 lot of time still weren't able to achieve a good error
10 rate, or you've got people that are very quick and
11 accurate. So is this a measure of usability difference
12 between the machine? We're not sure.

13 We asked the question, is it slower but cheaper,
14 and how would we use the time data? We know a lot of
15 folks are very interested in it because it affects
16 (unintelligible).

17 If it's a slower machine but cheaper so you can put
18 more in the polling place, is that better or worse than
19 a faster, more expensive machine? A very slow machine
20 clearly is not good from the voter's perspective.
21 That's going to frustrate the voter.

1 So the question that we're going to be dealing with
2 in the next month is do we set an upper limit on time
3 that you must pass or fail, or do we just report time?
4 And so I think I want to look at the data a little bit
5 more to see if indeed we can set some reasonable upper
6 limit with confidence levels that aren't too large. But
7 at the very least I think we should report it because it
8 is of interest.

9 MS. QUESENBERRY: This is Whitney. I'd like to
10 hear any input from the committee on this. I'll hold my
11 opinion until after that.

12 DR. JEFFREY: Does anyone else have an opinion on
13 this?

14 **(LAUGHTER)**

15 MS. LASKOWSKI: You can tell this has been a
16 hot debate within us. My opinion is that we should have
17 a very tightly constrained accuracy requirement and a
18 very loose and sloppy time requirement because there are
19 some trade offs that might be made in the design about
20 how long things take.

21 But we can probably say, you know, this fast would
22 be really good and this slow would be very bad. And the

1 question is where in the middle should this fall, and I
2 think it should be a kind of failsafe metric so that
3 we're not trying to reach for the sky on perfect fast
4 use of the system but we're trying to make sure that
5 there's a kind of net in which a system that takes a
6 really, really unreasonably long time to vote would
7 fail.

8 MS. PURCELL: This is Helen Purcell. One of the
9 things that you might see here though is that you're
10 trying to set up a situation that is similar to election
11 day and to a number of different voters, and some of
12 them may take an unreasonably amount of time in order to
13 vote that ballot.

14 And it also would depend on whether you're
15 questions or whether your ballot issues are just
16 candidate issues or are they actual propositions, which
17 would of course take longer.

18 MS. QUESENBERRY: This is Whitney again. I think
19 what we're talking about is the average time to vote
20 this ballot so this isn't a realistic -- you can't take
21 that number and say this is how long it will take to
22 vote.

1 You can't really calculate through (unintelligible)
2 this because we're controlling a lot of things that are
3 not really controlled, and I think the question that the
4 statisticians are dealing with is, is the performance
5 that we're getting so variable that it's not possible.

6 But if you have some people voting very quickly and
7 some people voting very slowly, you're looking at where
8 that average is and the question is should we be
9 controlling for the average time to vote, this ballot in
10 this test situation.

11 MALE SPEAKER: Is there any indication in the data
12 that in fact some voting systems consistently take
13 people longer to vote than other voting systems?

14 MS. LASKOWSKI: The next set of tests -- so I
15 test four different systems so I can answer that then,
16 but right now for the repeatability we've only done one
17 system. So I don't know, but based on other people's
18 research it appears that there are differences in time.

19 DR. JEFFREY: As long as the statement that time
20 doesn't correlate to error rate is a true statement then
21 it would seem like the information on how long it takes
22 on a specific ballot for different machines is something

1 only relevant potentially for procurement for state and
2 local officials, in which case it becomes an interesting
3 number but not a requirement.

4 It becomes something that an election official may
5 want to know if they're trying to decide between
6 multiple vendors but the crux to me seems to be whether
7 or not time causes an error rate and if that's
8 uncorrelated then it's an interesting number but not
9 critical.

10 MS. LASKOWSKI: Would you want a machine that
11 took half an hour on average for 100 voters to vote?

12 DR. JEFFREY: This is Bill Jeffrey. If I was an
13 election official I would like to know that when I'm
14 making a procurement decision but I wouldn't necessarily
15 make that a requirement.

16 MR. RIVEST: It's Ron Rivest. It seems it's
17 primarily a matter of cost. If you're trying to handle
18 so many voters per hour, you can buy more machines if
19 they're twice as fast or something like that. That's
20 the cost from the election official's point of view.
21 From the voters point of view of course it's certainly a
22 lot preferable to have a faster voting experience.

1 MALE SPEAKER: I don't see where setting limit
2 comes in. I'm more curious about the accuracy. How do
3 you pick a threshold for accuracy? I didn't quite
4 understand the philosophy of what that -- we end up
5 picking a threshold for --

6 MS. LASKOWSKI: We're going to look across
7 systems and we're going to say what's kind of reasonable
8 for systems to achieve, and we'll pick a benchmark based
9 on that and now we have a methodology for computing
10 whether a system meets that benchmark or not.

11 FEMALE SPEAKER: Looking at accuracy metrics
12 across people, across systems?

13 MS. LASKOWSKI: Across systems in a tightly
14 controlled population.

15 FEMALE SPEAKER: An average performance across
16 systems.

17 MS. LASKOWSKI: Average, right.

18 MR. WILLIAMS: This is Brit. I have a question
19 about your design. When you were building these
20 experiments, did you instruct the voters on time? Did
21 you request them to vote as fast as they could or did

1 you give them any indication that time was being
2 measured?

3 MS. LASKOWSKI: I'd have to look back at the
4 instructions. I believe they were told to primarily try
5 their best to vote this ballot, and they're getting paid
6 a small amount so I'm sure most of them wanted to get
7 through quickly.

8 **(LAUGHTER)**

9 MR. WILLIAMS: I agree with both Whitney and Dr.
10 Jeffrey on this. Time is insignificant here only as it
11 relates to accuracy because you'll find tremendous
12 variability in voting time between voters, more so than
13 you would between voting systems.

14 MS. LASKOWSKI: Yes, so if we were to set an
15 upper limit on time it has got to be a very high limit
16 to just exclude systems that for some reason just do
17 horribly on time, maybe. But as I say, I want to see a
18 little bit more data.

19 MR. WILLIAMS: I would just -- setting a limit on
20 time -- in fact I would even discourage telling voters
21 to try to vote fast.

1 FEMALE SPEAKER: I don't have the instructions
2 but I believe that the emphasis was on voting
3 accurately.

4 MS. LASKOWSKI: Yeah, it was to vote this as
5 best you can correctly.

6 FEMALE SPEAKER: Well let's hear back from you
7 when we've got the data. I think that's some good input
8 going into it.

9 MS. LASKOWSKI: Right, but I think we've made a
10 lot of progress.

11 DR. JEFFREY: Sharon, this is Bill Jeffrey. Along
12 those lines you mentioned the next test site. I think
13 you said June 1st and 2nd. When do you think there
14 would an analysis?

15 MS. LASKOWSKI: I have a timeline coming up.

16 DR. JEFFREY: Thank you.

17 MS. LASKOWSKI: We have a subjective
18 satisfaction questionnaire that we also administered.
19 It's really not statistically significant, however
20 confidence appears to be meaningful so we're thinking
21 that we could use it to set a lower bound on average
22 confidence.

1 So what that would mean is we'd modify the
2 questionnaire to have one confidence, something like I
3 felt confident that I used this voting machine
4 correctly, preceded by a question like do you feel
5 confident that you were able to follow the instructions,
6 because sometimes you get test participants that didn't
7 really pay close attention to the instructions.

8 MS. QUESENBERRY: This is Whitney again. Just to
9 remind everybody, the reason why we were looking at
10 accuracy, time efficiency, and satisfaction is because
11 the ISO standard definition of usability is efficient,
12 effective, and satisfying.

13 We change effective to accurate because that's
14 what's appropriate here, time is simply time, and way
15 back in 2003 at the NIST symposium before we were even
16 on board, you had already proposed that confidence was
17 the important measure in the satisfaction arena.

18 So I'm not surprised that satisfaction was all over
19 the map. I agree that if we're looking for a subjective
20 measure from voters that confidence is the right one to
21 look at, and if that's the one you've actually gotten
22 some correlation on, that's sort of cool.

1 MS. LASKOWSKI: Well they're not necessarily
2 correlated either so we're going to be looking carefully
3 at that, and I think we do care about confidence,
4 perhaps more so then time, and we've just discussed why
5 time is sort of a different issue but you do want the
6 voter to feel they were able to follow instructions and
7 that they were able to use the system until --

8 (Tape interrupted while changing sides)

9 **(END OF AUDIOTAPE 2, SIDE A)**

10 * * * * *

11 **(START OF AUDIOTAPE 2, SIDE B)**

12 MALE SPEAKER: -- Subjective measures to reflect
13 not just copies about the system but also about general
14 attitudes of the population at large or --

15 MS. LASKOWSKI: Well we're not using the
16 population at large. It's a very controlled experiment
17 but you still might be able to get something.

18 MALE SPEAKER: You know, I could imagine that this
19 could be swayed by public opinion or general attitudes
20 so do you see this as where it's useful and important to
21 have a requirement as opposed to just reporting the
22 subjective satisfaction limit?

1 MS. LASKOWSKI: Well, the confidence question,
2 yes. The others, I mean what was in the news today,
3 we're the voters depressed because it was after the
4 Virginia Tech shooting, I mean for one of the tests --
5 you know, there's a lot of other variables that you
6 can't control for in your population.

7 MALE SPEAKER: Let me be a little more concrete and
8 elaborate a little bit.

9 So you could imagine someone coming up with a brand
10 new voting system that the public has never seen before.
11 It's actually very good and that after it was used for a
12 little while people would feel confident in, but because
13 no one has ever seen it before you're getting test
14 subjects who have never seen or heard of this.

15 Would we be putting those kinds of systems at a
16 disadvantage because those test subjects might say well
17 gee I wasn't confident in this because I've just never
18 seen anything like this before?

19 MS. LASKOWSKI: Well, in the tests we've done
20 so far some folks hadn't used this particular system
21 before so we didn't notice any anomalies with respect to
22 that, the (unintelligible).

1 MS, QUESENBERRY: This is Whitney. I have no
2 doubt that the data is worth collecting. I think we
3 have something of the same problem as we do with time,
4 which is how do we set a bound for it. And I would
5 assume that no election official would purchase a new
6 system without doing some sort of due diligence and
7 approval within their own jurisdiction that would sort
8 of supercede any of this.

9 I think in both this, and the time, and the
10 efficiency measures, we're really looking for a way to
11 say are there any egregious problems that aren't showing
12 up in simple tasks like 3.0 fonts, which is a very easy
13 thing to test for. Are there things that are showing up
14 here that show up in softer measures that we ought to be
15 considering?

16 And I think the big question here for me isn't
17 should we measure it but how do we handle the data once
18 gathered. Do we simply report it, do we set a bound for
19 it?

20 And I think for both time and confidence, one of
21 the questions that we can't answer yet until you've done
22 the benchmarking work, is it even possible to set a

1 bound besides the back of an envelope, let's just decide
2 this number and draw a line, and that I don't think is
3 acceptable to anybody.

4 So it may be that this whole discussion is moot
5 because we can't find a way to set a useable thing that
6 we could be confident in using. So if that's true then
7 none of this discussion matters. We can simply report
8 it and let election officials interpret it as they will.

9 MS. LASKOWSKI: My last slide is timeline since
10 deadlines are looming. So we're on a May 22nd, and the
11 analysis on the three tests have been checked by the
12 NIST statisticians.

13 I see that this week after this meeting we're going
14 to finalize the counting method, try to create a sample
15 benchmark.

16 We're going to have some additional data coming in
17 for the next two tests that were just conducted so we'd
18 kind of like to look at those, and the statistician
19 hasn't checked that yet because that data was just
20 collected over the weekend.

1 We'd like to try to finalize a decision on the time
2 and confidence metric so the input here has been very
3 helpful.

4 And we're going to try to get a short description
5 of the analysis for a light person from the NIST
6 statistician, and they've given me some write-ups
7 already. It needs another pass.

8 So we're hoping that by June 8th, we'll have
9 delivery of the data and the benchmark, a short write up
10 of the process analysis ready for discussions in HFP,
11 completed by June 17th, everything checked by the NIST
12 statisticians by June 29th, show to the TGDC by June
13 25th, and finalized by July 1st.

14 MS. QUESENBERY: Sharon, this is Whitney again.
15 This is a very aggressive schedule and I think one thing
16 I'd like to say is that we will be discussing these at
17 HFP meetings, which are Fridays at 11:00 a.m. usually.

18 We will circulate that notice through the TGDC, and
19 when the benchmarks are on the schedule we will put it
20 at the beginning of the agenda so you can join for that
21 part and drop off for the perhaps less immediately
22 interesting discussions.

1 But I know we're in sort of a race to the end here
2 but if people who are interested in this could
3 participate in those discussions so that we can have
4 that sort of live (unintelligible) reporting it would be
5 very helpful.

6 MS. LASKOWSKI: Any other questions,
7 clarifications, discussion?

8 MR. RIVEST: Ron Rivest. Just a question,
9 setting the benchmarks is of particular interest to me
10 and I do hope that we can have some more discussion
11 through your committee meetings on that. I would just
12 like to hear about those discussions, more of a
13 description of the philosophy for setting the benchmark.

14 If system A tends to cause voters to make two
15 percent more accuracy errors than system B, is that
16 enough to make it unacceptable or how do we pick numbers
17 here? That's the question I'm --

18 MS. QUESENBERRY: This is Whitney. I can't
19 answer that question entirely but I do know that one of
20 the discussion we've had on the subcommittee is that
21 we're not looking for fine distinctions. We're not

1 trying to cut off between four and five on a scale of
2 100, but looking for 20 or 30s on a scale of 100.

3 MS. LASKOWSKI: And the way to set the
4 benchmark is to look across the systems, but at some
5 point there is going to have to be a decision across the
6 systems, did one do really badly so should we set a
7 benchmark so they fail at that point, where do we set
8 it. And so yeah, it depends on what the data looks
9 like. Not easy.

10 MR. MILLER: This is Paul. I have a question
11 relating to clarifying how this proposed usability test
12 relates to the usability testing in the 2005 standards.

13 Now if I recall correctly, in the 2005 standards
14 the vendor was required to do the usability testing and
15 provide those reports as part of the certification
16 process. Will they continue to be required to do that
17 or have we taken on that role?

18 MS. LASKOWSKI: I believe our view was, but
19 I'll defer to Whitney, is that that was in there to
20 insure that the vendors think about doing their own
21 usability testing. We're not judging the results but in
22 order for them to pass the benchmark they need to have

1 been doing some in house usability testing and so they
2 ought to be able to supply that information. Not quite
3 as critical if we get these benchmarks in as it was for
4 VVSG-05.

5 MS. QUESENBERRY: We have discussed this at some
6 length and one of the things that we said was well,
7 let's not take it out until we know we've got a
8 replacement for it and how confident we are in that
9 replacement.

10 DR. JEFFREY: Okay, barring any other questions or
11 comments, what I would recommend is we've still got the
12 one issue dangling out there, is that we break for
13 lunch, come back at one o'clock for the TGDC and EAC --
14 join us for lunch in the dining room right next door.
15 Go across the hall to pick up lunch in the cafeteria and
16 then just bring it across to dining rooms A and B.

17 And right after lunch if people can think about
18 resolution -- this is primarily on page eight of the
19 presentation, looking at the ease of record comparison,
20 whether or not they should be any modifications based
21 upon voter intent, and also the issue of the
22 applicability of this to the electronic ballot markers,

1 I believe were the two dangling issues out there, and if
2 we're ready to discuss that after lunch that would be
3 great. So with that please be promptly back at one
4 o'clock. Thanks.

5 **(LUNCH BREAK)**

6 DR. JEFFREY: I'll call the TGDC to order and I'll
7 ask the parliamentarian to please call the roll.

8 MS. ALLEN: Good afternoon. Roll call, Brit
9 Williams, Williams. Williams is not attending. Wagner.

10 MR. WAGNER: Here.

11 MS. ALLEN: Wagner is present. Paul Miller.

12 MR. MILLER: Here.

13 MS. ALLEN: Paul Miller is present. Gale.

14 MR. GALE: Present.

15 MS. ALLEN: Gale is present. Mason.

16 MS. MASON: Mason is present.

17 MS. ALLEN: Gannon.

18 MR. GANNON: Present.

19 MS. ALLEN: Gannon is present. Pearce.

20 MR. PEARCE: Here.

21 MS. ALLEN: Pearce is present. Alice Miller.

22 Alice Miller is not attending. Purcell.

1 MS. PURCELL: Present.

2 MS. ALLEN: Purcell is present. Quesenbery.

3 MS. QUESENBERRY: Present.

4 MS. ALLEN: Quesenbery is present. Rivest.

5 MR. RIVEST: Here.

6 MS. ALLEN: Rivest is present. Schuster,

7 Schuster. Schuster is not attending. Jeffrey.

8 DR. JEFFREY: Here.

9 MR. ALLEN: Jeffrey is present. We have ten in
10 attendance so there is enough for a quorum. Thank you.

11 DR. JEFFREY: Thank you. With that I think we'd
12 like to continue the discussion that we had right before
13 lunch. So Sharon, if you wouldn't mind coming up, I'll
14 let you lead the discussion.

15 MS. LASKOWSKI: (Off microphone).

16 DR. JEFFREY: Sharon, could you check if your mic
17 is on? Thank you.

18 MS. LASKOWSKI: Sorry. So the general issue
19 was how strictly do we have a requirement that asks the
20 voter to compare two distinct records or is it just
21 verification, and in particular I guess EBMs because the
22 ballot is printed out after the choices are made. We

1 wouldn't want to rule those out in a requirement that
2 too strictly asks for that comparison.

3 So there is some suggested wording at the bottom of
4 this spot, ease of record comparison. If the voting
5 system asks the voter to compare two distinct records of
6 his or her vote, as in VVPAT systems. So it's an if,
7 then the format and presentation of these records shall
8 be designed to facilitate a rapid and accurate
9 comparison.

10 FEMALE SPEAKER: And maybe we can get rid of the
11 gender specified and just say ask voters to compare
12 their --

13 MS. LASKOWSKI: Yes.

14 FEMALE SPEAKER: Or the record of the vote.

15 MS. LASKOWSKI: Yes, yes, definitely. I will
16 take care of that later, but let's take care of it now.

17 FEMALE SPEAKER: Just say the, just put the
18 there. Thank you.

19 MS. LASKOWSKI: So this sort of maintains, if
20 the voting system is designed so that you can compare,
21 it's designed in a way that makes it easy to do the
22 comparison.

1 MALE SPEAKER: In talking to David Wagner I'm
2 convinced that his point is a good one, that the goal
3 for the voter really should be to make sure that the
4 records that they're presented with represent their
5 intent.

6 And so if this is meant to imply that the voter is
7 given a task, they compare the two rather, then does
8 this represent how you want to vote, that's a little bit
9 misleading for the voter. So it's a minor point, and
10 I'm happy with this language as it is.

11 FEMALE SPEAKER: I actually was going to
12 question the, asks the voter to, and I think presents
13 the opportunity for the voter to, would be more neutral
14 language.

15 MS. LASKOWSKI: Yes, because it doesn't really
16 ask the voter.

17 FEMALE SPEAKER: Right.

18 MS. LASKOWSKI: Offers the opportunity instead
19 of ask.

20 FEMALE SPEAKER: Right. I mean I think the
21 intent when we drafted this the first time was that in
22 systems where they are in fact presented simultaneously,

1 it's just like our synchronized audio and video, that
2 they be presented in a way that doesn't put big barriers
3 between the two and so on, and Jenny pointed out that
4 this if was in there in the original and got lost
5 somewhere along the way anyway.

6 DR. JEFFREY: So as we are getting the grammatical
7 errors corrected, if I could ask David, it still doesn't
8 quite get to the intent but are you satisfied that this
9 provides the opportunity and would satisfy the issue?

10 MR. WAGNER: Dave Wagner. I'm satisfied with the
11 language. I think maybe the wording could be a little
12 clearer so that this does not become too overly broad,
13 that maybe -- I was happy with the discussion that if
14 they're presented simultaneously, if the system was
15 designed for enabling them to provide this opportunity,
16 then it ought to make it easy to do so. I think that
17 intent is great.

18 MS. LASKOWSKI: I would say we've often found
19 that stuff that we draft here needs a little thought and
20 reflection to make sure it's clearly written so we may
21 come back in telecoms and say we have a slightly
22 different wording.

1 But I think if we can all agree that maybe just by
2 head nods that this is what we're after then hopefully
3 if there are any changes what we come back with won't
4 distort that.

5 DR. JEFFREY: The chair recognizes several head
6 nods.

7 **(LAUGHTER)**

8 If I could ask, are there any TGDC members on the
9 phone?

10 MR. WILLIAMS: Yeah, this is Brit.

11 DR. JEFFREY: Okay, Brit. Sharon, could you read
12 this one more time for Brit so that he's got the actual
13 language?

14 MR. WILLIAMS: (Unintelligible) I don't know who
15 they are.

16 MS. MILLER: This is Alice. I'm here as well.

17 DR. JEFFREY: Welcome.

18 MS. LASKOWSKI: So this was the slide that
19 described moving the VVPAT requirement to the VVPAT
20 section.

21 DR. JEFFREY: This was slide eight of the original
22 presentation.

1 MS. LASKOWSKI: So the new wording is, if the
2 voting system offers the opportunity for the voter to
3 compare two distinct records of the vote as in VVPAT
4 systems, the format and presentation of these records
5 shall be designed to facilitate a rapid and accurate
6 comparison.

7 And the motivation being that if say in EBM where a
8 system is not designed that way, we wouldn't want to
9 rule out the system from certification.

10 MR. WILLIAMS: That wording sounds good to me.

11 DR. JEFFREY: Any other questions or issues for
12 Sharon?

13 Okay, well thank you very much.

14 MS. LASKOWSKI: Did we have a second issue?
15 That was it, okay.

16 DR. JEFFREY: No, would you like additional
17 issues?

18 MS. LASKOWSKI: No, just double-checking.

19 **(LAUGHTER)**

20 DR. JEFFREY: Okay. With that I'd like to switch
21 gears now to the security and transparency subcommittee
22 and I think Nelson Hastings will present the first

1 briefing. Okay, actually then Bill Burr will be doing
2 the first briefing. Thanks.

3 MR. BURR: I was going to begin with just a
4 little introduction and then I'm going to go into the
5 voter verified paper security requirements that actually
6 John Kelsey did most of the work on, and it would be
7 better if John were doing this but unfortunately he's
8 off in Barcelona right now, which is tough work but
9 somebody has to do it.

10 Actually I promised him that if he got all of his
11 stuff in on voting, to encourage him to work hard on
12 voting, that he could go to (unintelligible) if he
13 didn't get a paper accepted. And this is the week of
14 (Unintelligible) so he's there and I'm here. The sad
15 part about all of this is that I love seafood and John
16 doesn't, and he's in Barcelona and I'm here.

17 In any event, so the basic voting security problem
18 is the apparent vulnerability of computerized voting
19 systems undetected fraud and people are worried about
20 malicious code.

21 We know that many different kinds of computer
22 systems have been successfully hacked one way or the

1 other and sometimes these have been very sophisticated
2 attacks, and the public sensitivity has been aroused
3 about such attacks on computer systems of various sorts.

4 The truth is I believe that security critical IT
5 systems usually rely on strong audit systems and I think
6 the salient problem with voting has been in the last few
7 years in that respect, is how do you meaningfully audit
8 a DRE.

9 So the general approach that we've adopted here,
10 first of all is to try to simplify everything we can.
11 This is something security people always want to do
12 right, complexity is the great enemy of security
13 analysts or I supposed the analysis of anything.

14 And so a couple of things that any security guy
15 instantly wants to do when presented with voting is to
16 keep it disconnected from the Internet as much as you
17 can and to get rid of the wireless, and we've pretty
18 much done that.

19 The general principle that we have adopted has gone
20 the label of software independence and that just
21 basically means that we want to detect fraud or error
22 even if their code has bugs or has been tampered, and a

1 pretty good metric for how good you've done this is just
2 the size of the conspiracy you would need to defeat the
3 audit system.

4 So we need a strong audit system and we've wound up
5 settling on paper trails, which is what we're going to
6 come to in a moment.

7 We think we know how to do these. The voters can
8 verify them and they have a certain simplicity that
9 makes them understandable to people and you're not
10 taking that much on faith, or at least you can envision
11 the procedures that make for secure elections.

12 We failed in a lot of our efforts to develop
13 standards that we were happy with for all electronic or
14 paper free voting systems but we do have the paper.

15 So when you look at what we've got on security, I
16 think you can look at the different sections and they
17 basically break into two categories.

18 You do the obvious which is to say we design and
19 configure the systems just to make it hard to attack
20 them and that includes the sections primarily on set up
21 validation, physical security, documentation, software
22 distribution, system integrity management, communication

1 requirements. Those are all just basically to make it a
2 little bit harder for somebody to launch a successful
3 attack.

4 And then the other leg of this then is to introduce
5 a strong and in this case paper centric audit regime,
6 and in this case we've got security and audit
7 architecture, electronic records, the voter verified
8 paper record section, the cryptography which is mainly
9 there to secure electronic records, and system about
10 logging and voter verifiable paper records. So that's
11 basically where we've fallen out here.

12 I'm going to talk now about VVPR and in that
13 category we include paper roll voter verified paper
14 audit trails, cut sheet VVPAT, hand marked B cast
15 ballots and machine marked P cast ballots.

16 So we've got four basic categories of stuff in
17 section six.

18 The sort of overall summary is that basically the
19 requirements in this chapter organize that support
20 auditing and address the attacks that were identified in
21 the threat work that we did earlier.

1 We want of course to have a human readable voter
2 verified paper record that is enough to count in votes
3 from. We want them also to be largely machine readable
4 and we've added some requirements in the section of the
5 contents, the error handling and some paper roll privacy
6 requirements.

7 We also to make it easier for auditing have added
8 some sort of should -- they aren't exactly requirements
9 but we suggest that you should be able to support
10 breaking ballots in some cases into batches to make it
11 easier to (unintelligible) things and reduce the total
12 number of pieces of paper that a hand auditor -- it
13 would have to be handled and counted.

14 So we've got some general requirements on VVPR.
15 The first one is that the human readable record contains
16 all the information you need to count the ballots and so
17 there is no hidden information that you need to count
18 the ballots such as a precinct or election district that
19 isn't also readable to the human being.

20 We want the paper record also to be machine
21 readable and this I suppose has really two purposes. In
22 many cases an accessibility purpose, but for the

1 security point of view, it makes it in many cases easier
2 and better to do recounts or audits on a larger scale,
3 and in particular when it comes to audits, they don't do
4 you a lot of good unless you actually do them and if
5 they're better automated and easier to do, they'll
6 undoubtedly be done more.

7 We had a lot of discussion about bar codes and it
8 was one of these things that went on and on and
9 sometimes you almost in listening to the discussion
10 wonder if we weren't arguing almost about how many
11 angels fit on the head of a pin.

12 But in the end there's a sort of suspicion of bar codes
13 is that they might not actually be necessary and they
14 might introduce maybe possibly a subliminal channel, but
15 there isn't actually a strong security reason to ban
16 them.

17 In any event, the draft now explicitly allows them.
18 It just says they have to be in a public standard format
19 and they should contain a copy of the human readable
20 part. They may also contain some other kinds of data.

1 So VVPAT is fairly new architecture. I don't think
2 people were using it ten years ago and it sort of grew
3 out of the DRE machines.

4 The goal is to make VVPR useful for audits that
5 detect attacks. We have in the section, a discussion of
6 the human readable content, the sequence of steps for
7 voting, and the interactions between the printer and the
8 voting machine, the DRE and the voter.

9 And this is drawn from a variety of materials
10 including the Brennan Center report, the various threat
11 workshops we've had, other workshops we've attended, and
12 what we can learn about state laws and proposed new laws
13 about VVPAT.

14 And we've tried to do this so that we support just
15 about any kind of variation that we think anybody is
16 actually doing, although if you know of variations that
17 we aren't allowing that we should be, or things that we
18 are allowing that we shouldn't be, why of course we need
19 to know.

20 So what is VVPAT? Well basically it's a DRE system
21 that you put a printer on and the votes are cast using
22 some kind of electronic interface. The printer produces

1 a summary of the voter's choices. The voter is able to
2 verify those choices and the voter can accept or reject
3 the ballot, and that's a fairly simple idea.

4 The first requirement on all of this in the section
5 is that we want a standardized documented interface. We
6 want the printer to be able to detect and handle common
7 kinds of errors, that it is out of paper. If any of
8 these printers have ribbons or ink or whatever, you
9 should be able to detect and handle that.

10 There should be a procedure for clearing paper jams
11 and that sort of thing, and when there is a problem with
12 the printer it's really important that the election
13 official can determine whether or not the vote has been
14 cast.

15 I suppose that there has got to be in many cases
16 some probable pathological case where that may be
17 impossible, but you certainly to minimize the chances
18 that you wind up when there's some problem with the
19 printer, knowing whether the vote actually was cast or
20 not.

21 And another general requirement, although in
22 looking at this myself, I puzzle exactly how this

1 translates into anything that a lab can easily verify,
2 is that the voter either by accident or on purpose
3 shouldn't be able to create a discrepancy between the
4 paper and the electronic records. This isn't a simple
5 easy thing to decide if it's possible or not, but that's
6 certainly the goal.

7 So we have a sort of a protocol of operation of how
8 this is supposed to go and we've just actually spent a
9 fair amount of time discussing the first bullet on this
10 slide, which is that the paper and electronic records
11 are visible side by side.

12 Now we've got some new wording on that. I'll have
13 to make sure that that is taken into account. You know,
14 when the paper record is accepted it's marked or
15 accepted in the voter's sight and that means that he can
16 see right there on the printer that it's been accepted,
17 the record has been written, he knows it has happened.

18 And we allow two options to support what we believe
19 are different procedures that various jurisdictions use.
20 One of them just allows the voter to revote if he
21 doesn't like his vote, to mark his ballot on the paper

1 record as rejected and vote again, perhaps to some
2 limit.

3 Or other jurisdictions I gather would prefer to
4 have to have an election official come and reset the
5 machine. And so we explicitly allow either one.

6 So the contents, each paper roll can contain
7 certain things. It contains the voting machine
8 identifier, the election itself, the precinct, a roll
9 number for the machine, and when the roll is closed out
10 a summary line that tells how many cast votes are on the
11 roll, cast vote records and poll number accepted.

12 In each vote we required that you say what ballot
13 is being voted including the precinct and the district,
14 the type of voting. It could be provisional, it could
15 be early voting, it could be a regular election day
16 voting.

17 We require that there be a summary of the votes
18 actually cast and that under votes are identified so
19 that the voter can see that he didn't vote and a clear
20 indication as to whether or not after all this was
21 printed out, whether the voter accepted or rejected the
22 vote.

1 Now we also require that vote summaries not be
2 split across rolls and that certainly puts some real
3 restrictions on the printers. That means the printers
4 have to have some idea how much paper is left and have
5 to say -- it's not acceptable to just run out of paper
6 in the middle of a ballot, but it certainly makes
7 auditing and handling the conditions that arise a whole
8 lot cleaner and simpler.

9 For cut sheets, and this is where we come to a
10 fairly I think significant discussion point, each vote
11 summary contains essentially the same sorts of things
12 and here we say the vote summary is not split across
13 sheets of paper and this certainly makes an interesting
14 requirement. It will certainly make auditing and
15 handling the paper simpler if you don't split things
16 across sheets of paper.

17 The question is does that meet all our needs, and
18 so we can discuss that I think probably either now or at
19 the end, or we can take inputs that people have on that
20 requirement.

1 It's the simple, clean thing and I think a security
2 guy wants to do a simple, clean thing but does it meet
3 our real requirements for conducting elections.

4 MS. QUESENBERRY: This is Whitney. I'm certainly
5 not an expert on some of these procedures but I do know
6 that there are certainly situations in which the paper
7 ballot extends across two pieces of paper, so perhaps
8 the real requirement is that it not extend across two
9 pieces of paper without somehow indicating that on the
10 first one.

11 I mean the danger is that you read the first half
12 and you miss the second half of that vote on the second
13 sheet of paper, I assume is the worry.

14 MR. BURR: I'm not sure what the worry would be
15 but it implies I guess that you have some way to
16 associate a complete ballot I think and --

17 MS. QUESENBERRY: Yeah, and so what you've got
18 here in 6351E is it has to be on a single sheet of paper
19 but is the requirement a single sheet of paper or the
20 requirement that you can tell where the beginning and
21 end of one cast vote record are, and that you know that
22 you have all the pieces of it when you go to read it.

1 MR. BURR: Well as it's written now, it's
2 written one sheet of paper. Now what are the underlying
3 requirements, the requirement that we should have is the
4 point.

5 MS. QUESENBERRY: I've seen (unintelligible)
6 evidence of paper ballots where there's more than one
7 sheet of paper on the ballot so if that's acceptable,
8 why wouldn't it be acceptable here?

9 MS. PURCELL: Helen Purcell. We might be running
10 into a problem here as Whitney suggested. Just for
11 instance in our last election, we had a two page ballot
12 which was actually four sides with 93 questions on it.
13 How are you going to put this on one sheet of paper? I
14 don't know what size the sheet of paper is going to be
15 but it just --

16 MR. BURR: Well, when you do that on paper
17 ballots you don't necessarily try to keep them together
18 or associate them together as a complete --

19 MS. PURCELL: We identify the ballots as number
20 one and number two so we can easily identify which
21 portion that ballot is. Some people may not vote the
22 entire ballot, the four pages, but --

1 MR. BURR: It's not important necessarily then
2 that you be able to identify after -- that this is
3 complete for one person. You can separate the pieces
4 and deal with them separately and lose any association
5 between them?

6 MS. PURCELL; The machinery that we use to count
7 the ballots understands that these are two separate
8 pages of ballots, however they're identified as page one
9 and page two.

10 As I said you may not always have both pages
11 returned to you either at the precinct or in the mail,
12 but what we're saying here is talking about the entire
13 ballot being on one page and I don't know how in the
14 2006 election I would have accomplished that.

15 MS. QUESENBERRY: This is Whitney again. Maybe
16 the requirement is that a race or a contest not be split
17 across two pieces of paper.

18 MS. PURCELL: Like the first 12, but I mean --

19 MR. BURR: Okay, maybe that's a regional
20 requirement. I don't bring any particular preconception
21 to this question.

1 FEMALE SPEAKER: It just sounds very narrow and
2 very specific and it makes me wonder whether there are
3 exceptions, and we've already heard about one.

4 MR. BURR: Well it sounds like we're hearing
5 from Helen that that would cause her real problems.

6 MR. MILLER: This is Paul. I'm not confident
7 that that specifically would create a real problem. The
8 reason that ballots become more than one page is because
9 the length of initiatives, the text that's on the
10 initiative.

11 We're talking about the verification record at this
12 point, in which case presumably what we're talking about
13 isn't printing out the entire text, measures and so
14 forth, but simply indicating which selection that they
15 made. So it would be more conceivable -- I mean I admit
16 to some nervousness about confining it to one page.

17 FEMALE SPEAKER: What about Illinois and
18 judicial retention. I mean that filled the entire side
19 of a 22 inch ballot.

20 MALE SPEAKER: It's VVPAT, it's not paper.

21 FEMALE SPEAKER: No, but I mean you still have
22 that many -- it was that many names --

1 MALE SPEAKER: But again, and this perhaps raises a
2 question that hasn't been discussed yet, I don't know,
3 but in general what I have seen on verification tapes
4 are not even the list of all of the candidates in a
5 contest but simply which candidate was selected.

6 So even if you had 20 -- now if these are judicial
7 rates that you're talking about, maybe you're talking
8 about --

9 FEMALE SPEAKER: No, it's each judicial
10 retention. Every judge is re-listed every election with
11 a yes/no vote, so each name is a contest.

12 DR. JEFFREY: David, then Philip.

13 MR. WAGNER: Dave Wagner. I think that my
14 recollection is I don't believe we discussed this at
15 great depth in STS so I think that one reasonable stance
16 might be for the committee to suggest that we take this
17 particular provision back for further discussion.

18 I'll mention my personal, the trade offs I can see
19 here in case this is helpful for discussion. I can see
20 some pros and some cons of this particular requirement.

21 On the one hand as Bill described, a requirement to
22 be on a single sheet simplifies various aspects of

1 design. One aspect that wasn't mentioned is if you have
2 multiple sheets with a VVPAT, then you have to decide
3 what happens if the voter accepts the first page and
4 rejects the second page for instance.

5 Do you now go back into the selection mode, which
6 allows you to change a subset of the selections but not
7 a different subset? So there are some complexities
8 there in supporting multi page.

9 Also if you support multi page VVPAT that may make
10 auditing more challenging. Not a show stopper just it
11 may make it a little bit less convenient.

12 On the other hand this requirement does reduce
13 flexibility for the vendors. It's not clear to me
14 whether it would be needed.

15 I think as this discussion is brought out there are
16 several reasons why the VVPAT record might be much
17 shorter than what you're seeing on your opt scan, both
18 because it doesn't have the contest information and also
19 because it only has the candidate you selected.

20 So it does not need to show all of the options you
21 can vote for. It only shows the one you selected which
22 might be much shorter. So given all these complexities

1 I think it might be reasonable to say that this needs
2 reconsideration and further (unintelligible).

3 MR. WILLIAMS: This is Brit. I'd like to make some
4 comments on this. You're only printing the candidate
5 that's selected, I don't think is accurate anymore
6 because you're requiring now that you list all the under
7 votes.

8 Be that as it may, I think that the germane thing
9 here is not whether or not you split it in two sheets or
10 a couple sheets, but that the sheets be identical, that
11 sheet number one contain a certain races and sheet
12 number two contain certain races, and that you do not
13 overlap one race on sheet number one on one ballot and
14 sheet number two on another ballot.

15 That would create a nightmare in trying to handle
16 these things after the election. But when you're
17 talking about the multiple ballot issues, those breaks
18 are not arbitrary.

19 You've got the same identical ballot races on each
20 sheet of the paper so if you had the requirement that
21 the sheets had to be internally consistent, that is that
22 the races that are on sheet number one are well defined

1 and are always on sheet number one, and the races on
2 sheet number two are well defined and are always on
3 sheet number two, that would solve the problem.

4 The concern about voter rejecting one and not the
5 other is not valid because if the voter rejects any it's
6 rejecting the entire ballot.

7 MR. WAGNER: Dave Wagner. Thanks for that point,
8 Brit. I think you're absolutely right, that the same
9 races -- if you're having multiples sheets about the
10 same races being on the first sheet.

11 The only reason I was bringing this up was a
12 different point. It's not clear to me that multiple
13 sheets are needed. I can't prove that they're unneeded
14 but it's not obvious that they're needed because the
15 amount of space needed per race on the verification is a
16 lot less than the amount needed on an opt scan paper
17 ballot.

18 MR. WILLIAMS: We don't have to sit here
19 (unintelligible) and determine whether or not they're
20 needed. All we've got to do is say that if they're
21 needed, here's how we want it done.

1 DR. JEFFREY: This is Bill Jeffrey. I would agree
2 with Brit's comment. I mean unless there's a reason to
3 forbid it, you'd want to provide that flexibility, plus
4 taking Brit's comments about making sure that each one
5 is identical, I know one of the options we discussed
6 earlier was for those with limited sight, you could have
7 a larger font in the print out as opposed to
8 magnification since there was that option. So we'd have
9 to make sure again that there's a tie in between those
10 two requirements that don't end up with an
11 inconsistency.

12 MS. QUESENBERRY: This is Whitney. Although it
13 probably doesn't apply given the brevity of the text, it
14 would be on a record dealing with language expansion
15 because some languages are longer than others.

16 MALE SPEAKER: If we were to have different size
17 fonts, okay, that would go against the principle I
18 thought I heard expressed earlier that the breaks
19 between pages should always be consistent.

20 DR. JEFFREY: It doesn't necessarily mean that
21 that's inconsistent.

1 FEMALE SPEAKER: It might mean there's more
2 white space on one version then on the other.

3 DR. JEFFREY: Right. It just has to be
4 considered, and again we have to check the consistency.
5 I think I heard David's recommendation that this is
6 something that there's enough of subtleties and details
7 yet to be worked that it probably -- to go back to the
8 STS with this one to iron out.

9 MS. QUESENBERY: This is Whitney. I have one
10 other point while you're in this area ironing things.
11 We might want to have a slightly more ability neutral
12 language then in view of the voter or in sight of the
13 voter. It might be something like in the presence of
14 the voter.

15 MR. BURR: I suppose it can.

16 MS. QUESENBERY: Well if you're listening to
17 this ballot as an audio ballot, is it in your sight?

18 MALE SPEAKER: We can take this back to the STS
19 committee, although it's not clear to me what the sense
20 of the TGDC is. Do you want to require if we loosen
21 this that the voting system support multi page also, or
22 just optionally support them for example?

1 MR. WAGNER: David Wagner. I can't speak for the
2 others. I hope others will speak up. The
3 recommendation I would make would be not to require that
4 all systems support multi sheet, but one option that
5 could be considered would be to require vendors to
6 specify whether or not they support multi sheet and if
7 they do support multi sheet, here are some of the
8 requirements that they must meet. That might be one
9 stance it could take.

10 MS. QUESENBERRY: This is Whitney. Or simply say
11 -- well why not require them to support multi sheets?
12 It sounds like you could be in a situation where years
13 could go by, you've never had to need a multi sheet,
14 suddenly you have a very complex election for some
15 reason. All of a sudden you spill off to a second
16 sheet, what happens now?

17 So why not simply say that you've have people to
18 handle it in some way. You're going to have to deal
19 with this -- if a vendor opted for large font, if
20 there's a low vision, partial vision requirement, they'd
21 have to deal with it in any event.

1 MR. WAGNER: David Wagner. Okay, I think this is
2 great to get this kind of feedback. I'll just let you
3 know what I see the trade off of requiring all systems
4 for a multi sheet is that you're now forcing a lot of
5 complexity on the systems.

6 Again, I mentioned this case of what happens if the
7 voter rejects the first one and accepts the second. The
8 logic of the voting machine now becomes quite complex to
9 tell the voter that you can change your selections on
10 the second half of the races but you can't change in the
11 first half. Do we want to force all vendors to add that
12 kind of complexity to their system?

13 MR. WILLIAMS: You can't do that, David. You have
14 to reject the first, reject the second sheet. Reject
15 the first sheet, rejecting the entire ballot, and when
16 you revote the ballot it will again reprint the first
17 and the second sheet.

18 MR. WAGNER: David Wagner. I think that the
19 example I gave was a little different. Accept the first
20 sheet and reject the second sheet. If you've accepted
21 the first sheet and accept it -- print stamped on it and
22 it has been deposited into the ballot box, it's now in

1 there. It's not coming back out and if you then go
2 reject the second sheet, now what do you do?

3 MR. WILLIAMS: I don't think you can allow that.
4 Somehow or another you've got to -- if the voter rejects
5 the ballot they're rejecting the entire ballot.

6 MR. RIVEST: Ron Rivest. That means you have to
7 hold the first one in abeyance --

8 (Tape interrupted while change tapes)

9 **(END OF AUDIOTAPE 2, SIDE B)**

10 * * * * *

11 **(START OF AUDIOTAPE 3, SIDE A)**

12 MR. BURR: -- Give it a little more thought and NIST
13 can try and come up with the appropriate requirements
14 for multi sheet and schedule it for an NIST call then
15 and discuss it there.

16 MS. QUESENBERRY: This is Whitney. Bu the other
17 possibility is to say nothing on the subject.

18 **(LAUGHTER)**

19 DR. JEFFREY: This is Bill Jeffrey. Although I
20 would think that Brit's comment is important, that if it
21 does exist, you want them to at least have the same

1 races on each page. That would make auditing much
2 easier.

3 Okay, it sounds like STS has an action item.

4 MR. BURR: Yes. So then the next thing that we
5 cover is linking paper and electronic records, and here
6 we have a situation where some states say you shall and
7 some states apparently say you shan't, and so we want to
8 be able to do either.

9 It's also a good idea to not give the voter
10 something very easy to copy down that he could use in a
11 scheme where he's selling his vote to somebody, and
12 possibly on the inside able to look at the cast ballots
13 and there's some language in the spec that you can look
14 at. It shouldn't be hard for the voter to read.

15 I don't find it's terrifically convincing. This is
16 a tough thing to write, how to exactly do that, so maybe
17 this is an area we might want to discuss a bit too.

18 It seems to me this is a bit of a tough question.
19 You're linking it to the electronic record, you need
20 some sort of a unique identifier and I'm not quite clear
21 how you put it on the page and make it invisible to the
22 voter either. In fact I think you don't want to make it

1 invisible to the voter and so this is kind of a tough
2 call I think.

3 DR. JEFFREY: Bill Jeffrey. Just a quick
4 question. For those states that require the linkage, do
5 you know what the rationale is for requiring the one to
6 one linkage?

7 MR. BURR: I'm only guessing here, all right.
8 It seems to me like you can certainly do a much more
9 efficient audit that way if you have that linkage
10 because basic sampling theory says now you can make your
11 sample individual ballot over the entire -- whereas if
12 you don't have that linkage then it's almost like the
13 entire records of one machine or a least a batch which
14 we introduced later in some -- so I think you can just
15 make a much more efficient audit is what it boils down
16 to if you do that.

17 And on the other hand, obviously the linkage is
18 perhaps a weakness in terms of a vote-buying scheme.

19 MR. WILLIAMS: Most states have a requirement that
20 you cannot have a unique identifier on the ballot.

21 MR. BURR: Well, I'm not sure which are which
22 and I'd have to talk to John to see where he found the

1 case where they actually required it, but he tells me
2 that some do and some don't.

3 DR. JEFFREY: Is there a recommendation from the
4 STS subcommittee?

5 MR. RIVEST: Well, my recommendation is that the
6 linkage be supported. I mean clearly the election
7 officials if they want to bite the bullet of having to
8 get linkage information there and run some potential
9 risk of voter privacy violation in return for the cost
10 savings, potential cost savings on audit, that would our
11 recommendation that we allow them that choice.

12 MR. WILLIAMS: Well Ron, it's easy to keep the
13 linking information on the electronic ballot visible to
14 the voter. What if you printed the linking information
15 on the paper ballot after the voter had voted and as it
16 was scrolling off where he couldn't see it?

17 MR. RIVEST: Yeah, that would be a good solution,
18 Brit. That kind of thing where it's either physically
19 impossible for the voter to see the number as it's
20 written on the paper, or it's written in some format
21 that the voter can't easily digest and memorize. Yeah,

1 either one of those I think would be reasonable
2 approaches.

3 MR. BURR: Okay, so then let's continue here.
4 So we try to address paper roll privacy and a lot of
5 this has to be procedural and we have to support what
6 would be required for good procedures, and so we're
7 calling for secure containers for rolls containing vote
8 summaries.

9 We're saying the container has to support locks and
10 tamper seals, that they're put in the containers
11 immediately after they're cast, that printer error
12 shouldn't compromise anything that's already been cast,
13 and that the documentation provides a means for
14 protecting the voter privacy.

15 Do we have anything else that people can think of
16 here, at this point? If not we've had the PCOS systems
17 for quite a while.

18 So actually I don't know if that's exactly a
19 logical statement, but because you'd think now we'd know
20 enough, that have written all the requirements down in
21 gory detail, but in general most of the VVPR general
22 requirements apply. Do we have any additional things?

1 The only thing that we've really got here is the
2 notion that it's a good idea if the PCOS systems can
3 separate ballots into bunches so that the basic sampling
4 unit doesn't have to be everything that went through the
5 counting machine.

6 And, you know, there's a trade off here in terms of
7 if you don't want the batch small enough that it
8 possibly tends to compromise the identify of the voter,
9 but again if you're doing these things by hand, you're
10 doing a hand audit, the smaller your basic sampling
11 unit, the fewer things you actually have to count by
12 hand.

13 And so this is written as a should at the moment,
14 and it seems like a good feature if you can do it
15 anyhow.

16 MR. WILLIAMS: If this is left as a should it will
17 never get done because it's quite complicated to build a
18 receptacle under an optical scan system that will keep
19 things in nice orderly batches. They can all go on a
20 few batches based on whether or not you need to hand
21 examine them.

1 Most of the existing systems run every ballot
2 through a standard big hopper unless there's a write in
3 vote on it and it diverts that into a separate hopper.
4 I don't know anybody that's got anything that approaches
5 to separate things into batches.

6 MALE SPEAKER: By the same token you wonder if it's
7 practical to require them to separate them into small
8 batches or if it's worth the --

9 FEMALE SPEAKER: No, it's not practical.

10 MALE SPEAZKER: Well okay. On the other hand
11 if somebody can figure out a way to do it, it's a real
12 convenience from the point of view of audits.

13 MR. WILLIAMS: Yeah, you can leave it as a should,
14 and that gets people thinking about it anyway.

15 MR. BURR: I'm sure it's within the realm of
16 possibility, but you could triple the cost of the voting
17 machine or something, right, and you wouldn't want that
18 either.

19 MALE SPEAKER: And there would even be counter
20 arguments as to whether or not this is a desirable
21 feature in that. One of the arguments for using cut
22 sheet type of ballots which the PCOS is, it's a cut

1 sheet ballot, is that when it drops in there, there is
2 some randomization that happens because they don't fall
3 in, in a perfect order and so you couldn't pull the
4 ballots out of there and know what order they were
5 supposed to be in.

6 I actually had a question on the previous one and
7 wasn't fast enough to get in. I don't understand the
8 applicability of the voter verified paper record to a
9 optical scan system that you're marking the ballot
10 yourself. I don't understand why we're even raising
11 this in the context of this type of a system.

12 MR. BURR: Well, I think the hand marked
13 optical scan ballot is a kind of voter verified paper
14 record, is the categorization that's -- you're marking
15 yourself, real easy, you liked what you did.

16 FEMALE SPEAKER: Well I look at section 64 and
17 basically -- there's one requirement that's not about
18 batching. If we simply eliminated all the material
19 about batching you're left with the scanner may add
20 markings to each paper ballot including identifiers, and
21 I wonder about allowing them to add markings to the
22 ballots.

1 MS. PURCELL: Helen Purcell. One of the things I
2 might mention here, as we stated, the ballots are
3 separated at the precinct, and regular ballots and
4 ballots that have write ins on them, those are separated
5 automatically by the machine itself, but we do batches
6 on our early ballots for later auditing. We can pick at
7 random various batches, which are run through the large
8 machines on the early ballots because we do so many of
9 them.

10 In the ballot that comes from the precincts, what
11 we look at and what the legislature has asked us to look
12 at is certain races, not necessarily certain ballots but
13 we take within those ballots certain races off the
14 ballots. So we might want to talk about the batches
15 just when we're talking about the absentee or early
16 ballots.

17 MR. WAGNER: Dave Wagner. I just wanted to
18 clarify one thing about this VVPR. We've made a
19 distinction between VVPR and VVPAT. VVPAT is the
20 printer attachment to a DRE. VVPR is the broader
21 category that includes both optical scan and the VVPAT.

1 And so there are some requirements that apply to
2 both and this is just saying that the precinct optical
3 scan inherits all those requirements that apply to all
4 VVPR systems.

5 DR. JEFFREY: This is Bill Jeffrey. Let me just
6 try to get a sense for the TGDC. I'm still hearing that
7 keeping this as a should, mitigates peoples concerns
8 that it may be too complex or too costly but may be a
9 good goal in some cases with the exceptions of the
10 automatic randomization that can occur in the current
11 systems.

12 Bottom line, do people still want this, want it in
13 there, and if it's in there it probably is a should is
14 my sense. Whitney.

15 MS. QUESENBERRY: I guess I'm reading the sub-
16 requirements, if it does it, shall it do it, and some of
17 them seem a bit random, like the minimum size of the
18 batch and I just wonder whether that's the best left
19 procedure. I'd be willing to be argued out of it, just
20 seeing it for the first time --

1 MR. BURR: The purpose of the minimum size
2 again was to make sure you don't get a small enough lot
3 to be helpful identifying individual voters.

4 MS. QUESENBERRY: But where did the number 50
5 come from?

6 MR. BURR: I guess that's the sense of what's a
7 large enough group. Frankly I think that John made it
8 up but --

9 MALE SPEAKER: He's in Barcelona. He can't defend
10 himself.

11 **(LAUGHTER)**

12 FEMALE SPEAKER: No, I mean I know we've done --
13 inevitably one does -- I just wondered whether the sub-
14 requirements are actually useful sub-requirements in
15 changing the behavior or whether they're sort of obvious
16 and don't need to be there at all. And I don't have an
17 answer and maybe it's something else to toss back for
18 more discussion.

19 DR. JEFFREY: These are all in section 64?

20 MR. BURR: I think that requirement in
21 particular could be moved into discussion reasonably and

1 just left up to more discretion on the election
2 officials.

3 DR. JEFFREY: So I sense the substantive TGDC is
4 that basically 64 goes back to STS. Good.

5 MR. BURR: So in summary, we've tried to
6 establish requirements that support auditing and address
7 the attacks that were identified in the threat work. We
8 want human readable VVPR that's enough that you can
9 count all the ballots from it or count the votes from
10 it.

11 We do allow machinery more information. We have
12 some new requirements on the contents and additional
13 requirements on error handling, and recovery, and some
14 paper roll privacy requirements, and we've introduced at
15 this point the concept of breaking into batches for
16 easier auditing.

17 We've now got a couple of points to go back on the
18 STS with and try and wrap this thing up.

19 I've got another slide for discussion if we need
20 more.

21 DR. JEFFREY: Any comments or questions for Bill?

1 MR. WILLIAMS: This is Brit. I've got several
2 questions.

3 DR. JEFFREY: Go for it, Brit.

4 MR. WILLIAMS: Go back to slide number three if you
5 will. Are you there?

6 MR. BURR: Yeah, we're here but we're trying to
7 get to the slide.

8 MR. WILLIAMS: It says that you're developing
9 standards that you were happy with for all the
10 electronic or paper (unintelligible) systems.

11 Now if you look at the (unintelligible), you still
12 have lever voting machines five years after Haver was
13 enacted, and it's reasonable to assume that we're going
14 to have electronic paper free voting systems for the
15 next two, three, four, five years while these wonderful
16 systems that we're defining are being developed.

17 Whereas you couldn't come up with any standards
18 you're happy with, could you come up with some that
19 you're sort of semi-happy with to get that new system
20 some kind of guidance? With all the security expertise
21 you've got you ought to be able to think of something
22 they could do.

1 **(LAUGHTER)**

2 MR. BURR: Okay. This is sort of reopening
3 Pandora's box here in a sense. From my perspective at
4 least, I think we could design relatively secure
5 electronic paper free voting systems here at NIST but
6 we're probably not the world's best voting system
7 designers.

8 FEMALE SPEAKER: Bill, if I could offer you a
9 way out, perhaps the answer is that there are
10 requirements in VVSG-05 and you could think
11 (unintelligible) would improve on that.

12 **(LAUGHTER)**

13 And what we might want to do in the period while
14 this is being enacted is to leave well enough alone.

15 MR. RIVEST: I'd like to support Whitney's
16 suggestion. I think that grandfathering systems that
17 were certified under the older standards would be the
18 appropriate approach here unless you've got a better
19 idea how to handle them, Brit. I don't know.

20 MR. WILLIAMS: Well I'm not on the security
21 committee. I was trusting in your alls ability.

22 **(LAUGHTER)**

1 That's a cop out, Ron.

2 **(LAUGHTER)**

3 Dr. Jeffrey: This is Bill Jeffrey. In addition,
4 I believe that the resolution that was passed in
5 software and (unintelligible) system actually echo's
6 Ron's sentiment.

7 In addition, I think that there's also procedural
8 things, best practices, that are outside the scope of
9 the systems but more in terms of the operations. They
10 are captured in I think some guidelines that the EAC has
11 put out.

12 MR. WILLIAMS: You're right. But I would like to
13 see at least a statement in the VVSG to that effect.
14 These systems can be effectively used as long as you
15 adhere to certain (unintelligible) by management
16 guidelines rather than just be silent on the whole issue
17 or even --

18 MR. RIVEST: Bill, are you suggesting that it
19 would be a procedure for certifying new systems that
20 aren't software independent?

21 MR. WILLIAMS: No, no, no, I'm not suggesting
22 certifying any new systems, Ron. I'm talking about

1 living with the reality that we're going to have some of
2 these systems for three to five years.

3 MR. RIVEST: I agree with that. That's certainly
4 the case and then they can be used. But does this
5 belong in the VVSG or where do you want to put them?

6 MR. WILLIAMS: Well, I hate to see the VVSG be
7 silent on the issue and I hate even worse for it to
8 imply that they can't be secured at all.

9 MR. WAGNER: David Wagner. I think we should
10 view the VVSG as designing a set of standards that
11 determine whether equipment will be compliant to the
12 next generation VVSG, and I think we shouldn't enter
13 into this debate in the text of the standards. It's
14 just a rat hole that we could spend endless time on.

15 MR. WILLIAMS: Okay, let's go up to slide five.
16 I've got an easier question.

17 **(LAUGHTER)**

18 We talked about VVCLR and VVPAT, and the VV just
19 rolls off of our tongues easily and sometimes we say
20 voter verified and sometimes we say voter verify. In
21 the interest of unambiguous definitions, what does V
22 stand for?

1 MR. BURR: I think verifiable is what we mean
2 to say.

3 MALE SPEAKER: Brit, it's not the expectation that
4 all the voters will take advantage of the opportunity to
5 verify their ballots. I mean verifiable is sort of a
6 testable requirement. Voter verified is something,
7 which may or may not happen at an individual election
8 session so I'm not sure what we say in our glossary.

9 MR. WILLIAMS: Okay.

10 FEMALE SPEAKER: Ron, in the terminology
11 definitions for both VVPAT and VVPR, it says voter
12 verified.

13 MR. WILLIAMS: That's wrong. It should be voter
14 verifiable.

15 FEMALE SPEAKER: Verifiable.

16 MALE SPEAKER: It should be changed.

17 MALE SPEAKER: The definition is clear. It says it
18 supports voter verification.

19 FEMALE SPEAKER: And do we think shall be
20 changed?

21 **(LAUGHTER)**

1 DR. JEFFREY: It shall be changed. I get the
2 sense of the TGDC that the definition, the second V in
3 VVPAT and VVPR will be verifiable.

4 MALE SPEAKER: I'm happy with that. I think it's
5 clear. I think it's a term with a lot of usage and
6 tradition outside of this group and I'm sure we'll get
7 lots of public comment whichever way we put it down.

8 MR. WILLIAMS: Okay. All right, my last question
9 is on page eight, 58. Where you say that the VVPR has
10 to be machine readable and human readable. Is the human
11 readable portion got to be machine readable, or the
12 machine readable be covered by say a bar code?

13 MALE SPEAKER: So the intent I think is that the
14 human readable also be machine readable. The NIST staff
15 did a lot of investigating of OCR technology and things
16 like this and it really seems to be having advanced
17 tremendously in the last few years so that having a
18 requirement that the human readable is also machine
19 readable is the intent here I believe.

20 MR. WILLIAMS: Okay, you're explicitly saying that
21 the unreadable portion is to be in a machine readable
22 font?

1 MR. WAGNER: David Wagner. Perhaps I could
2 interject here. I don't mean to be pedantic but I'd
3 like to go to the actual text of the standard. I don't
4 think these slides were written as carefully as the text
5 of the current draft of the standard.

6 And I'll read to what the current draft that I have
7 in front of me is. NIST staff can correct me if I've
8 got a misinterpretation.

9 MALE SPEAKER: Can you give us the number for the
10 record?

11 MR. WAGNER: Yes, section 6.2 requirement, I
12 guess it's supposed to be 6.2-B. It's actually numbered
13 as 12-B.

14 It says the paper record should be created in a
15 manner that is machine readable, and then lists sub-
16 requirements that apply to the machine readable
17 representations. But I'll note that it does not include
18 the word shall in the current form.

19 MR. WILLIAMS: Well I guess the question should be
20 a shall, because to me if the machine readable portion
21 is going to be that bar code, then you're reading
22 something that the voter was not able to verify. The

1 bar code is not voter verifiable. The only way this
2 requirement makes sense to me is that the human readable
3 portion be machine readable.

4 MR. RIVEST: I like what you're saying, Brit.
5 This is Ron Rivest again. And we had a lot of debate in
6 STS about this issue.

7 There's considerable sentiment, just eliminate any
8 bar code representation of voter choices whatsoever
9 because you end up with all kinds of complexity in terms
10 of trying to match the human readable -- you have to
11 audit the bar coded representation against the human
12 readable representation as well. It's a bit of a can of
13 worms.

14 On the other hand it seemed to be in principle a
15 manageable can of worms if you wanted to go that way.
16 It seemed much better to follow the advice you're giving
17 us Brit, which is just to stick with the human readable,
18 also the machine readable. I personally like that too.

19 MR. WILLIAMS: Well Ron, you know, the irony is
20 that you're saying that it's not going to do any kind of
21 official count with the bar code, you're saying you
22 don't trust the computer that wrote that bar code, but

1 now you're going to turn around and trust the computer
2 that's reading it.

3 MR. RIVEST: This is Ron Rivest again. The bar
4 coded reader could be supplied from an independent
5 manufacturer or something like that, yeah. It still
6 fits within the definition of software independence in
7 the sense you've got evidence that if there's software
8 during the vote capture stage that's acting improperly,
9 you can nail it with an appropriate reader.

10 The integrity of the audit mechanism is a separate
11 issue from software independence and then is only
12 subject to solutions such as alternative vendors and so
13 on. But you're absolutely right that there's a real
14 issue there with having (A), the voter not being able to
15 know what's in the bar coded representation, and then,
16 (B), having the necessity of checking that human
17 readable information corresponds to the bar coded
18 information.

19 That's a real problematic situation. It's one that
20 we in the end decided not to rule out explicitly, but I
21 think that considerable good argument can be made for

1 just ruling out any kind of ballot choice information in
2 the bar code.

3 MR. WILLIAMS: Yeah, I don't have a problem with
4 the bar code as long as you can machine read the human
5 readable portion.

6 DR. JEFFREY: This is Bill Jeffrey. I just want
7 to make sure should the requirement on machine
8 readability of paper records, and it's at the bottom of
9 page 63 which is normally 1.2-B, I'm sensing that the
10 should, be changed to shall. I think that's what I
11 heard you say Brit, and I think that's what I heard Ron
12 say. What's the sense of the TGDC?

13 So what this would now read is, the paper record
14 shall be created in a manner that is machine readable.

15 MR. WILLIAMS: Well you want it machine readable.
16 You know, I'm questioning how useful that is but --

17 MS. QUESENBERRY: Brit, this is Whitney. I mean
18 I agree, unless somebody tells me there is some other
19 good reason that it shouldn't be a shall, that I was one
20 of the few supporters of bar codes, and I was a
21 supporter of bar codes because I was looking to make

1 sure the paper record has as many hooks for
2 accessibility as possible.

3 And requiring that the text be formatted in a way
4 that's machine readable will not only facilitate audits
5 and so on, but will facilitate accessibility.

6 We felt the same way about bar codes. I think bar
7 codes are a well known easy and inexpensive technology.
8 OCR has come a long way but there's the possibility of
9 some reasons why bar codes might be helpful to
10 accessibility and we didn't want to see it ruled out,
11 but I do agree that if the main intent is to audit off
12 of the text, that that text ought to be machine readable
13 for both audits and accessibility.

14 MR. WILLIAMS: Well yeah, as you're defeating the
15 whole purpose of verifiable -- you're not reading what
16 the voter implied.

17 DR. JEFFREY: David, then Paul.

18 MR. WAGNER: David Wagner. I just want to make
19 sure that there's clarity on what the feedback we're
20 getting is. Director Jeffrey's has given us a very
21 specific proposal to change a should to a shall, so it

1 would say the paper records shall be created in a manner
2 that is machine readable.

3 So I believe what that effectively would require is
4 that -- would we be requiring effectively that the OCR
5 at least in principle, is that what is being proposed?

6 MALE SPEAKER: I think that's what is being
7 proposed, yes. It wouldn't be necessarily what's called
8 the standard OCR font. I think OCR has gotten better
9 then requiring that, so it just means that there are --

10 MR. WILLIAMS: I wouldn't specify Paul. I'd just
11 say --

12 MALE SPEAKER: No, you don't want to go there.

13 MALE SPEAKER: I also Whitney, was one of the
14 supporters and am a supporter of at least the option of
15 having bar codes on the verifiable record, and in
16 particular I think this impacts the EBM set of
17 technology because using the example of auto-market, it
18 would be very difficult I believe to make that truly OCR
19 available given the amount of text that would be on that
20 ballot and given that it would also have to be able to
21 read the location where the oval was filled in.

1 I don' t know how that would be done without -- so
2 it is my thinking this time with the knowledge I have of
3 the technology which may not be fully up to date, but
4 that the bar code would almost be necessary or required
5 there to be able to provide a feedback mechanism for
6 people with disabilities.

7 FEMALE SPEAKER: A feedback mechanism that
8 didn't require a ballot definition, right, because the
9 real -- if you had a whole separate standard, you have
10 now three things with ballot definition and that seems
11 unworkable.

12 Basically I'd like to say it's not closed doors
13 when there's not a real reason to do so and I think this
14 triple requirement which is that the human readable
15 information can be used to count the ballot, that the
16 paper record, that the human readable stuff is machine
17 readable, and that non-human readable in coding doesn't
18 add information besides a couple of very specified
19 things that we've allowed it to add, covers that and
20 leaves us the most flexibility moving forward.

21 MR. WAGNER: David Wagner. I guess now that I
22 hear what I'm hearing, I'm concerned because I think

1 what I'm hearing now is a little different then what I
2 thought the question was.

3 I think it's one thing to say that the human
4 readable content has to be created in a way that's OCR
5 able. That would be one kind of requirement to apply,
6 but now I think what you're saying, is talking about
7 requiring that all the systems print a bar code on the
8 VVPAT and I'd be very concerned about anything that has
9 that affect.

10 FEMALE SPEAKER: No, no.

11 MR. WAGNER: Okay, so where did the bar codes
12 come into this? Could someone help me understand?

13 FEMALE SPEAKER: Not banning them.

14 MR. WAGNER: As I understand Director Jeffrey's
15 proposal, his proposal does not affect the current
16 stance on bar codes. So the current stance on bar codes
17 would be they would not be banned and it would be
18 possible to turn them off, and this would not make any
19 changes to that current stances, is that the sense?

20 DR. JEFFREY: Yeah, and I actually don't have an
21 actual resolution on the table. I'm trying to summarize
22 where we are and seeing if anybody wants to make a

1 resolution such that the requirement that now says the
2 paper record should be created in a manner that is
3 machine readable, would say the paper record shall be
4 created in a manner that is machine readable.

5 And I will echo David's comment that this has
6 nothing to do with allowing or not allowing bar code.
7 Is there anybody who wants to make that -- Brit, was
8 that the recommendation you were trying to make?

9 MR. WILLIAMS: I wasn't so much making a resolution
10 as trying to get clarification.

11 DR. JEFFREY: Does anybody want to make this
12 shall?

13 MR. WILLIAMS: `I have no problem with that
14 recommendation.

15 DR. JEFFREY: Okay, Whitney wants us to vote.

16 **(LAUGHTER)**

17 MS QUESENBERRY: Sorry, I said do we need to
18 vote on it. We haven't voted on anything else today.
19 We've sort of been doing it on a (unintelligible).

20 DR. JEFFREY: Yeah, well I was actually going to
21 come back to the one on one, but I do want to get a
22 sense for this because I'm not sure where people stand

1 on this issue. So I'll actually make a proposal and see
2 if anyone -- not that I actually support the proposal
3 I'm about to make but no one else is making it.

4 The proposal that the requirement be changed to the
5 paper record shall be created in the manner that is
6 machine readable. Is there a second?

7 MALE SPEAKCER: Second.

8 DR. JEFFREY: Okay, its been seconded.

9 MALE SPEAKER: Let me question what this means
10 because we have two kinds of information representation
11 on paper right now. We typically have the textual
12 information, which are graphical symbols, A, B, C,
13 whatever and the graphical little circles that are
14 filled in. And so there's a qualitative difference
15 there.

16 And there's a question as to whether you need the
17 ballot style information or not, which is the point
18 Whitney raised or not.

19 So is it machine readable if it's little circles
20 are filled in with a ballot style, or is it that you
21 want something that's machine readable without that? I
22 think with the should, it's sufficiently ambiguous, we

1 don't care, but with the shall, we really need to be
2 very clear about what we're saying here.

3 FEMALE SPEAKER: I suspect that what we really
4 mean is that a VVPAT style record shall be, and it would
5 be nice if you could make a marked ballot and marked up
6 scan style ballot be, but I'm leery of that.

7 MR. WILLIAMS: Now you created a dilemma when you
8 locked (unintelligible) optical what's in the DRE ballot
9 then it's something required there. What we're really
10 talking about here is not the optical scan ballots.
11 They're okay. What we're talking about is the printed
12 ballot on direct recording device.

13 MR. WAGNER: David Wagner. Point of
14 clarification, what the proposal is currently on the
15 table applies to VVPAT ballot marker and
16 (unintelligible) optical scan. So if you want it to
17 apply only to the VVPAT, you should presumably make that
18 explicit or change that to make that explicit.

19 MR. WILLIAMS: Well, the dilemma that Ron's talking
20 about only occurs when you lump those two together.

21 FEMALE SPEAKER: Exactly. I guess I'd turn to
22 STS and say would you rather have something that's

1 explicit for one and should for another, or would you
2 rather have it be a should for both. I mean it's either
3 one requirement that's looser because it only applies
4 part way, or it's two requirements that are more
5 specific, and I'm okay either way.

6 MALE SPEAKER: I can't speak for the entire STS but
7 my personal opinion is that having any kind of textual
8 information does not (unintelligible) the up scan style
9 be machine readable as well having that be a shell, I
10 would be happy with that. So maybe split it in two.

11 FEMALE SPEAKER: So we change the scope and make
12 that VVPAT.

13 MALE SPEAKER: This would be splitting this into
14 two parts so leave the should for ballot marker and PCOS
15 and make it a shall for VVPAT.

16 FEMALE SPEAKER: So two requirements.

17 MALE SPEAKER: Yeah, that would be the --

18 DR. JEFFREY: Okay, I'd like to withdraw the
19 resolution and change it then. So that what's now -- on
20 the top of page 64 is where we're talking, so the
21 requirement will be the paper record should be created
22 in the manner that is machine readable, would apply to

1 ballot markers and PCOS, and then a separate
2 requirement, the paper record shall be created in a
3 manner that's machine readable, that will apply to
4 VVPAT. Is there a second?

5 MALE SPEAKER: Second.

6 DR. JEFFREY: Okay, there's a second. Any
7 additional discussion?

8 MR. MILLER: Yeah, this is Paul. I guess my
9 confusion lies in making a requirement that one sort of
10 system can be verified by people with disabilities and
11 another system can't be verified by people with
12 disabilities, and why have we made that distinction?

13 FEMALE SPEAKER: Can I suggest that we send this
14 back to the committee? And I think we're clear on what
15 we want, which is to make sure that the records we
16 produce are readable in as many unambiguous ways as
17 possible with creating divergence of the information,
18 but I think the wording of this is rather delicate and I
19 hate to have a resolution on the table that needs to --
20 something that maybe needs a little more thought.

1 MR. WILLIAMS: And what I'd like to see out of this
2 is if I want to do a machine count of VVPAT, then I want
3 to be able to machine count what the voter verified.

4 DR. JEFFREY: Right. The resolution that's on the
5 table due to the compelling arguments has been withdrawn
6 and STS gets another action item to sort through all of
7 this and to insure that the system is both ease of
8 auditability and ease of accessibility.

9 **(LAUGHTER)**

10 MALE SPEAEKR: Are we withdrawing the motion and
11 the second?

12 DR. JEFFREY: Yes, the motion and the second were
13 withdrawn. Okay, anything else? Brit, any other --
14 Okay, Bill, thank you very much. I think now it's
15 Nelson's time.

16 MR. HASTINGS: Good afternoon. I'm going to talk
17 about changes that have occurred to the STS material
18 since the March meeting and give a summary of that.

19 So I'll give a general update on what's really
20 happened throughout all of the different sections so
21 there's some commonality there of the activities that
22 we've been doing, and then I'll go into the specific

1 chapters or specific sections in volume three, beginning
2 with chapter seven going through to chapter 15.

3 The items on this slide that are marked new are
4 actually new sections or chapters that have been added
5 since to the VVSG build compared to the VVSG build that
6 was made in March.

7 So in general we've distributed the requirements to
8 STS for review and comment. The exceptions to that are
9 system integrity management and communications. Those
10 are still being finalized internally here at NIST before
11 we provide those to STS for review and comments.

12 We've received a fair amount of comments on all the
13 sections. In general, minor modifications. We've just
14 been going ahead and making those changes in line.
15 Major modifications are changes in directions we've been
16 discussing with STS and other subcommittees as needed
17 before those changes have been incorporated.

18 In addition, we've done some harmonization with
19 other parts of the guidelines. We will continue to do
20 that over the next X months. We've also modified the
21 applies to fields, the text reference fields, the source
22 as an impact field as well, and we will continue to

1 update those as those sections develop.

2 MR. GANNON: This is Patrick Gannon. Before you
3 go into the detailed requirements, you're discussing
4 your first idea, the general changes to the -- I'm
5 asking if the discussion of what has changed from
6 previous version to this version, is that what's being
7 included here?

8 MR. HASTINGS: In general, so in all the different
9 sections we've gone through and we've modified the
10 applies to the test reference, and sources and impact
11 field. We've done harmonization across all those
12 sections with other parts of the VVSG. That's what this
13 is saying.

14 MR. GANNON: Okay, what about other major
15 sections that have been added to the VVSG, is that just
16 part of this presentation?

17 MR. HASTINGS: That will be in the specific
18 sections, so we have the general overview and then we go
19 into each of the detailed ones and the ones that are
20 marked new are the sections that have been added since
21 the TGDC meeting.

1 MALE SPEAKER: Do any of those that are marked new
2 include the electronic record section? I didn't find
3 that in the details.

4 MR. HASTINGS: Okay, Bill Burr had touched on that
5 in his presentation. That's where those were covered.

6 MR. GANNON: In the slides Bill just gave?

7 MR. HASTINGS: Yes. Isn't that --

8 MR. GANNON: I didn't see any slide discussing
9 electronic records.

10 MR. HASTINGS: Okay, those didn't change?

11 FEMALE SPEAKER: Didn't change from the March
12 meeting.

13 MR. HASTINGS: I'm hearing that the electronic
14 record section that are included in this version of the
15 VVSG that you guys have hasn't changed since the last
16 TGDC meeting.

17 FEMALE SPEAKER: Why don't we push on and come
18 back.

19 MR. HASTINGS: So the cryptography requirements, we
20 made no modifications to that section since the last
21 meeting, that's chapter seven.

1 Just want to point out, during the last meeting we
2 talked about having a (unintelligible) 140 however,
3 cryptographic modules for each piece of voting equipment
4 so that means election manager systems would have
5 cryptographic modules imbedded in them as well as vote
6 capture devices. Essentially a device that creates an
7 electronic record would have an embedded cryptographic
8 module.

9 In terms of key management for that module, we'd
10 have a long term key associated with the piece equipment
11 so that you could identify the records that are made by
12 that piece of equipment as well as an election specific
13 key for each election.

14 Set up validation requirements have been modified,
15 specifically the use of an external device to do
16 software verification of the software that's installed
17 on the voting system.

18 At the last meeting the concern was the scoping of
19 that, what types of devices should have an external
20 device to check the software that's been installed on
21 it.

1 Election management systems, this was discussed in
2 the STS subcommittee and election management systems
3 were identified as systems that should support this
4 capability since most of those systems are run on PCs
5 that already have an external port to it. So you can
6 use an external device to connect that and check the
7 software on that.

8 Next we looked at vote capture devices and we
9 qualified that to network vote capture devices. And I
10 believe the text from the first bullet and second bullet
11 is in the discussion section of 8.3.2.2-D.

12 And basically defining what is a network vote
13 capture device and then defining a vote capture device
14 that's considered network if it communicates to more
15 than one election management system or other vote
16 capture device, and in that situation that type of vote
17 capture device that's consider network would be required
18 to have an external device to verify the software that's
19 installed on that system. So we'll talk a little bit
20 more of what this impacts on.

21 Two types of architectures. If you have stand
22 alone vote capture devices that say at the end of the

1 night you pull the memory cards from those devices to a
2 consolidation (unintelligible) device that then uploads
3 that data to the central election office, that device
4 that consolidates all that data can be transmitted up
5 would require an external device to verify that
6 software.

7 Another interesting architecture is if you have a
8 controller that controls several satellite devices in a
9 polling place, the controller itself would be required
10 to have this external device to verify the software on
11 that system, however the satellites devices connected to
12 that controller would not require that.

13 That said, the non-network vote capture devices
14 still must support the general requirement and actually
15 in the text of the document, there's a citation to that
16 general requirement of verifying software installed on
17 the voting device but it can use techniques that do not
18 require separate verification devices. So it doesn't
19 necessarily need to be an external device for that.

20 So that was pretty complicated there so if you have
21 any questions.

1 Okay, we'll continue on. Software distribution and
2 installation requirements, those have been modified
3 since the last TGDC meeting.

4 Requirement have been added for the build of
5 previously certified voting system software so there is
6 some requirements in there that describe how to do
7 witness build if you will for previously certified
8 voting system.

9 So if there is an update to that voting --
10 (Tape Interrupted while changing sides)

11 **(END OF AUDIOTAPE 3, SIDE A)**

12 * * * * *

13 **(START OF AUDIOTAPE 3, SIDE B)**

14 MR. HASTINGS: -- Certain pieces of software on
15 voting equipment are not going to change such as the
16 operating system if it has one, such as the general
17 voting application itself probably will not be required
18 to be changed however, but there are certain things such
19 as definition files that need to be changed.

20 So this discusses how one would replicate the
21 common pieces of software across the different pieces of
22 equipment.

1 Now as we were looking at these requirements, many
2 of these requirements are procedural in nature. They
3 have procedures on vendors, procedures on voting test
4 labs, as well as repositories, as well as some on
5 jurisdictions.

6 So the question I guess here is, we've captured
7 these requirements here but is the VVSG the appropriate
8 place for such procedural requirements, and I'm just
9 going to throw that out to you in terms of if some
10 procedural comments should be captured here, if so,
11 which ones.

12 MALE SPEAKER: Nelson, could you reference the
13 specific sections that these are tracking to?

14 MR. HASTINGS: What page was that again?

15 MALE SPEAKER: 9-16.

16 MR. HASTINGS: So let's take for example, the
17 requirements found in 9.3.3, which are requirements
18 related to building of the voting system software.

19 There are several requirements in there that apply
20 to viduals, what viduals should do, what vendors shall
21 do.

1 FEMALE SPEAKER: Doesn't what the test lab shall
2 do, sound like a test method rather than a requirement
3 on the system?

4 MR. HASTINGS: I meant that's the question. I have
5 captured that here. I don't know if this is really the
6 appropriate place for those types of requirements.

7 FEMALE SPEAKER: I think we've tried to be
8 pretty rigorous in other places that the requirements
9 and product specification are things that either the
10 product must be able to do or the vendor must supply as
11 a component of the product and then the test methods are
12 back --

13 MR. RIVEST: This is Ron Rivest. This is a
14 somewhat different situation where you want the STL to
15 participate in the authenticated build of the software
16 so it's not testing a capability that the vendor
17 supplied but
18 actually --

19 FEMALE SPEAKER: it's still a method.

20 MR. RIVEST: It's not testing anything. They're
21 just providing an authenticated piece of software in the
22 end.

1 FEMALE SPEAKER: But isn't that sort of the set
2 up for the test?

3 MR. RIVBEST: No, it's a service capability
4 they're providing to the election community.

5 MR. WAGNER: David Wagner. This is a core part.
6 I don't know whether it belongs in the standard because
7 I've had little experience in writing standards.

8 This describes the procedures that the test lab
9 will use to build an executable software that will then
10 be distributed to all of the jurisdictions. So this
11 procedure is needed to insure that what the
12 jurisdictions are using matches what the test labs
13 actually tested and inspected.

14 MR. HASTINGS: I just want to say one thing going
15 back to the requirements for the build of previous
16 certified software.

17 Those requirements are based on some of the
18 requirements found in the EAC testing and certification
19 program manual and we looked at that and saw how that
20 correlates to the requirements here in the standard.

1 In general the requirements that are here are a lot
2 more specific than the ones in that handbook, in that
3 manual.

4 MALE SPEAKER; So I think the question is whether
5 this is the right way to do things. I think it is the
6 right way. We want the system to work. The question is
7 which part of these fit in the VVSG, and in terms of
8 things that may talk about parties even outside of the
9 test lab or the vendor even like the jurisdictions,
10 where does that information, those sets of procedures --

11 MR. HASTINGS: Do those fit in the best practices
12 somehow?

13 FEMALE SPEAKER; It sure sounds like something
14 I'd want the NAVLAC program to weigh in on. I mean,
15 sorry, I hate to keep tossing stuff back to you guys but
16 I think there are two questions.

17 One is, do we all think this is good stuff, and the
18 other is how to best communicate it in the right place.
19 And for the second, I think we would turn to NIST, both
20 the NIST voting team and the NAVLAC team to make that
21 determination.

1 MR. HASTINGS: Mark, would you like to say
2 something?

3 MALE SPEAKER: Yes.

4 **(LAUGHTER)**

5 MARK SPEAKER: So let's not confuse now procedural
6 requirements for voting officials with procedural
7 requirements for testing because clearly we're not
8 putting procedural requirements for voting officials in
9 there, but it seems to me much of the instructions for
10 test labs are procedural in nature.

11 They shall supply this, they shall do this, so to
12 me it's perfectly appropriate to put it in the VVSG.
13 It's a requirement on a test lab so we have two sets of
14 requirements in the VVSG. Requirements on vendors which
15 are much more specific, and requirements on test labs
16 which are typically procedural because they're telling
17 them this is what they need to do in order to conform.
18 This is how they test. This by definition is a
19 procedural requirement so most of them are. So to me
20 it's perfectly appropriate to be in the VVSG.

21 FEMALE SPEAKER: Isn't that volume five or am I
22 just confused?

1 MALE SPEAKER: Oh, that's a different issue. I
2 thought the question was is it appropriate to include in
3 the VVSG. Where it goes is --

4 FEMALE SPEAKER: That's something I thought you
5 guys were the experts on and --

6 MR. RIVEST: Thanks, Mark. This is Ron Rivest.
7 I think I agree with most of the stuff will fit within
8 the VVSG but there's section 9.3.6 that does talk about
9 what the jurisdictions shall do too, which probably
10 belongs somewhere else.

11 I think we've got to think about -- it says the
12 jurisdiction, it's on page 9.43, it says the
13 jurisdiction shall create a software distribution
14 package, master copy containing election specific -- I
15 mean we could maybe make that an assumption -- on the
16 assumption that they're providing this, and the vendor
17 shall supply equipment that handles it properly or
18 something. But we can't say what the jurisdiction is
19 going to do.

20 MR. HASTINGS: I figured that section would be --

21 MR. RIVEST: Yeah, that's the one problematic
22 section perhaps.

1 DR. JEFFREY: Any other comments, questions on
2 this? Okay.

3 MR. HASTINGS: Okay, so this was recently
4 distributed to STS with these updates in it.

5 Access control requirements, let me get that.
6 There has been no modifications made to these
7 requirements, however they need to be updated based on
8 the feedback we've received from STS, specifically in
9 terms of requirements that limited operating systems may
10 not be capable of supporting.

11 So we're in the process of doing that updating
12 right now, so the requirements in here do not reflect
13 that work that's going on right now.

14 Two approaches that we're looking at, one approach
15 is to modify the applies to fields to limit the scope
16 appropriately. The other is to possibly put conditional
17 statements if blah, blah, blah, then the voting
18 equipment shall do. So we're investigating which would
19 be the most efficient.

20 System integrity management requirements, these are
21 new requirements. These requirements relate to
22 integrity checks at different points as the system comes

1 up. So you do an initiation check of the boot system
2 before actual booting the system. You do an initiation
3 of the operating system before you actually load it.
4 You do initiation of the voting application software
5 before loading it.

6 And when we talk about loading it here, we're
7 talking about loading it into memory for execution.
8 That's where the loading is coming from. It's not
9 loading it on the system in terms of just putting it
10 there and installing it.

11 So this diagram shows you the different stages. So
12 you have boot initiation. You do an integrity check.
13 That correlates to requirement of 1.2.2-C. The
14 numbering I believe is inconsistent with the chapter but
15 that number I think is in here.

16 So you check it, if it passes you continue to boot,
17 otherwise you terminate and you do the same type of
18 process to the OS as well as the applications itself.

19 In addition to those types of requirements we have
20 monitoring requirements on voting systems such as
21 restricting or watching the up processes that are

1 executing on the system if it's a multi threaded
2 operating system.

3 You do software integrity checks to make sure that
4 the software that's stored in mass storage hasn't been
5 modified, as well as having some requirements for
6 scanning of the software for malware and viruses.

7 Also there are requirements limiting the execution
8 of software stored on removal media. You don't want to
9 have a piece of removal media. You stick it in and
10 automatically execute that. We have requirements that
11 say you shouldn't do that. You also want to
12 authenticate the removal of the media when it's
13 installed on the piece of voting equipment.

14 We're currently working to scope the requirements
15 appropriate based on the concerns of equipment
16 capability again, such as if a voting system has a
17 general purpose operating system versus one that has a
18 limited operating system. And this to be distributed
19 for STS just for review.

20 Another new section that we have is the
21 communications requirements. It has the no wireless

1 requirement in there except for infrared when it has a
2 shield path.

3 We're introducing a level of communication model.
4 I have on here a three level communication model. The
5 one in the introduction is a four level communication
6 model and we're looking at possibly simplifying it to a
7 three level communication model.

8 The three levels will be physical levels so that
9 deals with the medium that's used in the communication,
10 the network level, the communication protocol used in an
11 application level communication between different
12 applications.

13 And what we're trying to do is to develop
14 requirements based on securing the different levels
15 within the communication model.

16 Most of the requirements revolve around the network
17 and application level itself, such as uniquely
18 identifying network interfaces, authentication of
19 network data packets, monitoring of in bound and out
20 bound network traffic, and once again we're looking at
21 how to scope these requirements appropriately based on

1 when that operating systems is used on a piece of voting
2 equipment.

3 And this is being worked on and will be distributed
4 to STS for comment and review shortly.

5 System event logging, no modifications have
6 occurred in that section. The requirements are being
7 updated to address scoping concerns basically based on
8 the capability of the underlying operating system. If
9 the operating system doesn't have a given capability,
10 does it make sense to have -- you can't allow that type
11 of an event.

12 So what we've done is we're looking at stratifying
13 the events to be logged. So general voting events must
14 be logged regardless of whether it's being logged
15 through the operating system itself or through some
16 manual means, things such as opening and closing the
17 polls, results of zero total checks, changes to
18 cryptographic keys. Those things probably should be
19 logged regardless of whether it's done through some
20 manual process or an automated process.

21 Then we have events that are based on the
22 capability of the voting equipment, so operating systems

1 are limited operating systems, authentication events or
2 database connection events.

3 So if an operating system is only a single user it
4 may not make sense to log all the events related to
5 authentication.

6 So the next one we'll look at is physical security
7 requirements. This is a new section. What we've tried
8 to do is develop requirements that result in tamper
9 evidence and disabling of the physical ports of voting
10 equipment.

11 This has been distributed to STS as well as some
12 other people on the TGDC and we've gotten feedback on
13 that specifically related to the lock requirements.

14 And if you want to turn to that, I can give you the
15 specific number here. It's in the physical security
16 section so it would be in volume three, chapter 14. The
17 UL requirement is 1.2.6-A.

18 And so this speaks to the strength of the lock
19 itself. So is it resistant to picking techniques, is it
20 resistant to forcing techniques in order to open it.

1 Then the other requirement that we have gotten
2 feedback from is related to 1.2.6-C, which has to do
3 with key management.

4 In general, the intent of this requirement is to
5 have vendors be able to provide unique keys for a given
6 jurisdiction or to state it another way, so that a
7 common key isn't used for all the locks produced by the
8 vendors -- how am I saying this?

9 FEMALE SPEAKER: You don't want someone to be
10 able to go from one jurisdiction to another carrying
11 their key with them and have it work.

12 MR. HASTINGS: Yes, exactly. So that's the intent
13 of that. Thank you. Must be running out of gas here.

14 What the requirement doesn't do, it doesn't require
15 a unique key for each piece of voting equipment. It
16 doesn't prohibit having say like a statewide level
17 common key as well.

18 At this point I'd like to open it up for a little
19 discussion, specifically on these two requirements
20 because the strength requirement has been questioned on
21 whether the lock is actually used to prevent -- what's

1 the purpose of that lock I guess is the question. Brit,
2 are you still on line?

3 MR. WILLIAMS: Yep.

4 MR. HASTINGS: Would you want to give your position
5 on this?

6 MR. WILLIAMS: Well, I think it's well known.
7 Well, what you're talking about, the thing that's
8 generally talked about here is the compartment where the
9 on and off switch, and the memory card, and things like
10 that are on the voting station.

11 And it's well known for instance that one key opens
12 all over the voting station. The hackers have made a
13 big deal about that.

14 Bu the point is that that lock is not a security
15 feature. It's a barrier. It's like putting a four foot
16 chain link fence around your backyard. You're not
17 telling yourself that you've secured your backyard. All
18 you're doing is keeping the neighbors dogs and cats out.
19 And that little lock is there to keep voters and voters
20 children from tampering with what's in that compartment
21 during an election.

1 So to treat that like a major security feature it's
2 (unintelligible).

3 DR. JEFFREY: I guess just for clarity for people
4 to look at, this is on page 14-6 and 14-7. These are
5 the two areas that he's talking about.

6 MR. WAGNER: David Wagner. Would it be helpful
7 to suggest that vendors specify for instance if they
8 have locks that are not a barrier security feature and
9 the security system does not rely upon the security of
10 that lock, to specify for their locks whether they're
11 relying upon that for security or not, and have the
12 testing lab check those claims.

13 So if the vendor says we're not relying upon the
14 security of this lock for the security of our system, to
15 then permit them to use some weak lock and to require
16 the testing lab to go double check, that indeed if that
17 lock is picked nothing bad happens.

18 MR. WILLIAMS: Yeah, I have no problems with that.
19 You know, the general uneasiness here is that everything
20 like this we do in standards adds a little bit of
21 incremental cost, a little bit of complexity to the
22 voting system and it's likely to infect -- a lot of

1 individual (unintelligible) aren't going to hurt you if
2 enough (unintelligible) you completely (unintelligible).

3 MS. PURCELL: One of the things I mentioned is
4 when we're talking about Nelson, a jurisdiction, and it
5 would be different for each jurisdiction, an election
6 might multiple jurisdictions on the say day in the same
7 locale.

8 Like I might have 24 plus jurisdictions all voting
9 on the same day in their own separate elections. It
10 would be difficult just because of the way the county is
11 set up and so forth to deal with those each individually
12 in that instance.

13 MR. HASTINGS: The term jurisdiction was used to
14 provide some delineation between at what granularity
15 should non-common keys be used or be available. It
16 doesn't necessarily say that across jurisdictions you
17 couldn't use it. It says that the equipment could be
18 configured such that at the jurisdiction level you could
19 do that.

20 Now if the jurisdiction level isn't the right level
21 of granularity, I'd like to know that and we can make
22 that modification.

1 MR. WILLIAMS: Jurisdiction is fine, along with
2 having the requirement that the vendor be able to have a
3 unique key if the customer wants it. But if you look at
4 the state of Georgia -- Helen says she's got 24
5 jurisdictions. We've got a 159 and trying to manage 159
6 keys would be a nightmare.

7 So think that this should be an optional -- that
8 the vendors should be required to furnish unique keys if
9 the purchaser in their purchase station requires it.

10 And another thing that unique keys do is they keep
11 you from sharing equipment between jurisdictions.

12 DR. JEFFREY: Nelson, this is Bill. And Brit, for
13 clarity, again the way I read this is if a state wants
14 one unique key for the entire state across all
15 jurisdictions that's consistent with this. It's up to
16 the state. It's just that the vendor needs to have the
17 ability to go down to the jurisdictional level if he
18 desires. And I think that's the way that it's written
19 now.

20 MR. WILLIAMS: Yeah, the way this is written now --
21 the way it initially came out, we had a lot of problems.

1 DR. JEFFREY: So let me just clarify. Brit. So
2 you're actually okay with the way that this is written
3 as is?

4 MR. WILLIAMS: Yeah.

5 MALE SPEAKER: I wanted to do a further
6 clarification because I read this. The state level
7 jurisdiction that we've discussed and I think clarified
8 here, then below that is the jurisdiction that's
9 responsible for conducting the election, which is what
10 Helen was referring to, within that jurisdiction that's
11 responsible for conducting that election, there are many
12 sub, much smaller jurisdictions within that.

13 I've read this to mean the granularity is at the
14 level of the jurisdiction that's responsible for
15 conducting the election. Is that correct?

16 MR. WILLIAMS: When election officials use the word
17 jurisdiction they're generally referring to a
18 jurisdiction that is conducting an election. The state
19 would not be a jurisdiction.

20 MALE SPEAKER: No, I wasn't referring to the state
21 but I was referring to -- for example in the state of
22 Washington, we have 39 counties that conduct the

1 elections. Within those 39 counties there are many
2 smaller jurisdictions, at least in Washington we do use
3 the term jurisdictions for them.

4 So we would have cities within the counties. We
5 would have water/sewer districts, we would have
6 (unintelligible) districts, we would have a variety of
7 districts within.

8 My initial interpretations of this language was in
9 my state the jurisdiction that you're referring to is
10 the county. So the county buys all the equipment,
11 deploys all the equipment, and the granularity that
12 you're asking for here is that if one county has this
13 vendor system and another county in this vendor has the
14 same vendor system, that those two counties be able to
15 have keys that are uniquely formed to each other.

16 MALE SPEAKER: If they want it.

17 MALE SPEAKER: Yes, thank you.

18 MR. WILLIAMS: Well, we want to be able to share
19 equipment, and borrow each other's equipment, and sell
20 equipment, so then they might want to have the same.

21 MR. HASTINGS: I need some clarity here. If there
22 are no questions, I have a question.

1 Back to the requirement on the strength of the
2 lock, where do we stand on that? Should that
3 requirement stand? I guess David you suggested that we
4 qualify that possibly. If the vendor views that lock as
5 a security feature then this requirement should be in
6 effect.

7 MR. WILLIAMS: But otherwise I think that's an
8 overkill.

9 FEMALE SPEAKER: Actually I thought he said
10 something even simpler, which is that the vendor should
11 simply specify whether it's a security feature or not,
12 and if it is then its fair game to attack.

13 MR. HASTINGS: Okay, Ill let David speak --

14 MR. WAGNER: David Wagner. If you think we
15 should take this back to STS or to leave this to NIST --
16 I would just add that there was a second clause to what
17 I was proposing which was if the vendor specifies,
18 claims that it's not security relevant then the testing
19 lab should check that.

20 MR. HASTINGS: Okay, I think that provides me a
21 little clarity on that.

1 MR. WILLIAMS: But the jurisdiction in this is
2 whoever owns and is responsible for the equipment.

3 MALE SPEAKER: That's what I was asking to be clear
4 on because the way I understood Helen to be talking, she
5 was referring to her sub-jurisdictions and not the
6 jurisdiction that owned and operated the software.

7 MR. HASTINGS: What we could do is we could go back
8 and make that clarification in the discussion section
9 that talks to what is the jurisdiction, or put in a
10 clause there that says the jurisdiction that owns and
11 operates the voting equipment for perfect clarity.

12 DR. JEFFREY: Nelson, this is Bill. Either
13 clarify that, or I checked, its not define up front, so
14 either make a definition that defines jurisdiction or
15 clarify it referring to the discussion.

16 Let me just seek some clarity myself then. Brit,
17 as it stands now on page 14-6, the physical and casing
18 lock requirement that references underwriter lab 437,
19 are you wanting that to now go back to STS to be
20 potentially modified to go along David's suggestion?

21 MR. WILLIAMS: If the vendor says that this lock is
22 a security lock then it should be at that level.

1 Otherwise you don't have to put that (unintelligible) on
2 there.

3 DR. JEFFERY: Right. So it sounds like there
4 should be an if then clause.

5 MR. WILLIAMS: And with the understanding that this
6 puts some burden on the jurisdiction that owns that
7 equipment. They've got to put in place other procedures
8 to protect the security of the equipment.

9 DR. JEFFREY: This is Bill again. The one thing
10 I'm concerned about on David's suggestion is that if we
11 have the clause then that the testing labs need to
12 verify, if they said it's not a security feature, the
13 testing lab needs to verify that. I'm not sure what the
14 testable piece is, and we put the burden on the test
15 labs without the ability to test.

16 MR. RIVEST: This is Ron Rivest. Presumably that
17 would fit well within the OAVT portion of the testing so
18 the testing could say we can assume that this lock is a
19 meaningless barrier or trivial barrier in terms of
20 testing, and if they can launch an attack that presumes
21 that that lock be picked or actually pick it in the lab,
22 I don't care. Then that would be one way of testing it.

1 The question is what attack can you mount given that
2 that lock can be picked easily.

3 DR. JEFFREY: This is Bill. That's a good point,
4 Ron. If that's the case when STS goes back and revisits
5 this if they could capture that, and that may need to be
6 made explicit in OAVT section that includes the physical
7 vulnerability and not just suffer vulnerability.

8 MR. HASTINGS: Okay, I'm going to move on now to
9 the security documentation requirements. This is new
10 section that was created. It has two general high level
11 requirements which we will look at on the next couple of
12 slides and then it has -- what we did is we pulled in
13 the access control documentation requirements to kind of
14 show you what the low level requirement documentation
15 requirements would look like in this section, and we've
16 put in a placeholder for other sections.

17 So that the next thing to do would be to bring in
18 all of the low level security documentation requirements
19 into this section and then move this section into I
20 believe its volume four, chapters three and four
21 appropriately the user documentation in the TDP
22 documentation.

1 So here's the first high level requirement that
2 basically -- it says vendor shall document in the TDP
3 all aspects of system design development and proper
4 usage that are relevant to system security.

5 This includes but is not limited to system security
6 objectives, all hardware and software security
7 mechanism, development procedure employed to insure the
8 absence of malicious code, initialization usage and
9 maintenance procedures necessary to secure operation,
10 and all attacks the system is designed to resist and
11 detect any vulnerabilities known to the vendor. So
12 that's kind of like the overarching documentation
13 requirement.

14 Then we have kind of a second high level
15 documentation requirement that says vendors shall
16 provide at minimum the high level documents listed in
17 table one, and I've just put these into a bulleted list
18 here as part of the TDP so in your document it has the
19 table there.

20 The documents include the security threat control
21 document that identifies the threats and maps to that

1 security controls that are used to address those
2 threats.

3 Then you have a security document that provides an
4 architectural level view of how the security
5 requirements of the VVSG itself from that. This
6 document is where you get that mapping of the security
7 requirement of the VVSG to the actual architecture of
8 the system that's being investigated or put up for
9 testing.

10 Testing and security vulnerability analysis,
11 documents that describe security test performed, and
12 this would be security tests that are performed by the
13 vendors before the system is provided to the labs for
14 testing. So it's just additional documentation provided
15 by the vendor as help to the test lab.

16 The next three documents I believe overlap with
17 general documentation requirements that already exist so
18 we need to do some harmonization with these.

19 There's an interface specification document,
20 there's a design specification document, and then
21 there's a development environment specification
22 document, and like I said I believe that there are other

1 requirements in volume four that if not totally cover
2 these, cover them partially. So that's the
3 documentation requirements and where it stands.

4 So that's all I have right now.

5 DR. JEFFREY: Any additional questions or comments
6 for Nelson?

7 MALE SPEAKER: I would like to follow up on my
8 previous question after the break.

9 DR. JEFFREY: I will take that as a subtle hint
10 that we should break.

11 **(LAUGHTER)**

12 Let's come back at 3:20 p.m. on the dot.

13 **(END OF SIDE B, START OF SIDE A)**

14 DR. JEFFREY: Okay, minus one minute warning. I'm
15 going to ask John Wack if he could get up. I'd like you
16 to address the electronic records issue first that
17 Patrick Gannon brought up if you don't mind.

18 MR. WACK: Okay, Patrick noted something that
19 we overlooked and that is that the VVSG right now has
20 the electronic records chapter in it and I believe it is
21 chapter five.

1 Last meeting we did a slide presentation, John
2 Kelsey did a slide presentation where he discussed
3 requirements in that section but in fact indeed this is
4 the first time we have actually put this material out.
5 Up to now it's only been in front of STS.

6 So I think that perhaps the right thing to do would
7 be for us back at NIST to look at the slides that John
8 presented last time and perhaps send them back out again
9 and if there are additional items we should add, we
10 could bring them up tomorrow, if that would be
11 acceptable. Does that sound like a good idea or
12 workable plan there? And apologies.

13 DR. JEFFREY: Are you okay with that? Okay, good.

14 MR. WACK: Now there's one other item that Dave
15 Flater didn't mention this morning and that is a change
16 to a section that was called interoperability in the
17 core requirements area that he changed to
18 intergratability that dealt with intergratability of
19 electronic records.

20 So I've asked Dave if he would come up for a minute
21 or two and just talk about that.

1 MR. FLATER: Thank you, John. The section that
2 we're talking about is volume three, section 16.6,
3 intergratability.

4 We had a discussion about this on an STS conference
5 call and the changes that I made to this section I
6 consider in the category of things that change the
7 wording, possibly made things more precise to say what
8 they meant, but not a substantive change to the intent
9 of the section.

10 MALE SPEAKER: David, could you repeat which
11 section again?

12 MR. FLATER: Volume three, section 16.6,
13 intergratability, and 16.7 too.

14 And I believe that the language that was agreed
15 upon in that conference call now appears in this
16 section. I would call your attention -- particularly at
17 the bottom of the informative text. It mentions the
18 barriers to interoperability are further reduced if all
19 systems support the same commonly agreed upon industry
20 standard format, and this follows a discussion about the
21 difference between intergratability and
22 interoperability.

1 Similar changes have been made to the requirements
2 that follow, additional informative text has been added
3 to reduce the barriers to interoperability. Vendors
4 should strive to use the same commonly agreed upon
5 industry standard format.

6 John Wack is continuing to make edits to the
7 informative text for this section to add specific
8 references to standards and standards work that is
9 ongoing at this moment, including EML and the effort
10 that is ongoing in IEEE, and of course if there is any
11 other relevant work he would love to hear about.

12 MR. WAGNER: David Wagner. I have question on
13 this. For some reason I had a vague recollection but
14 quite possibly my memory is failing me, that we had
15 discussed a requirement for the system to have the
16 capability to export cast vote records in a royalty free
17 open published format.

18 I see looking at this text that that's not
19 currently a requirement. Is there an expectation that
20 that requirement will be added or is it somewhere else?

21 MR. FLATER: Well, what you described is one
22 approach to satisfying the intergratability requirement.

1 We have a shall requirement here saying all DREs shall
2 maximize intergratability with respect to ballot image
3 data, which is the CVRs.

4 And one way of satisfying that requirement is by
5 providing the capability to export that data in a
6 royalty free published open format. However, there's
7 another way to satisfy it listed here, which is talking
8 about using essentially an open database and this
9 doesn't preclude other ways of satisfying that
10 requirement.

11 If in fact there is a definite requirement that all
12 of these systems shall export CVR data using an export
13 format as opposed to another mechanism of satisfying
14 intergratability, that comes beyond what CRT needs to be
15 in this section. This is I think becoming possibly a
16 security issue.

17 We've kicked this back and forth between STS and
18 CRT and no one has come out and said yea verily we must
19 have a requirement that says you must always have the
20 ability to export this data in open format. It's a
21 means to an end if you will and the end in this case is
22 intergratability .

1 MR. WAGNER: David Wagner. Well, I agree this is
2 not a security issue. I don't see any security reason
3 that would require that export capability. And this is
4 not really my call but let me give you some of the
5 arguments why one might want to require that export
6 ability.

7 Right now the requirement that we have is, shall
8 maximize intergratability which is about as ambiguous
9 and an untestable requirement as I've ever hears.

10 So in practice what that means is they'll become a
11 no opt, that that will probably have no affect.

12 So while the intent is a nice one, I think there
13 could be two benefits that I can see to election
14 officials for the ability to export CVT.

15 One argument here is that this may advance the
16 cause of interoperability and may make it easier for
17 auditing or for other kinds of extensions to the voting
18 systems, which might help give election officials more
19 choices in supporting innovative new equipment or
20 extending their system.

21 The other that I could see here is a very narrow
22 one. For those limited number of jurisdictions that are

1 considering using methods like rank choice voting, there
2 is some benefit to be able to export the cast vote
3 records because then the primary voting system doesn't -
4 - you can use rank choice voting methods with a system
5 that wasn't originally designed to support rank choice
6 tabulation by extending it with a separate component
7 that does the tabulation logic using those exported
8 records.

9 So it might aid flexibility and it might aid
10 inoperability, which might in turn give election
11 officials more choices.

12 DR. JEFFREY: Is that support of a recommendation
13 for an actual requirement?

14 MR. WAGNER: Dave Wagner. I think at this point
15 I wanted to lay this on the table and really it's
16 probably the election officials and the users of the
17 system who should be speaking up.

18 DR. JEFFREY: Okay.

19 **(LAUGHTER)**

20 MALE SPEAKER: Not hearing any such speaking up --

21 DR. JEFFREY: Yes, not hearing any such speaking
22 up. Let me just try one more thing. Paul, go ahead.

1 MR. MILLER: Go ahead.

2 DR. JEFFREY What I might recommend David is if
3 you could re-couch that and more directly, how that
4 would impact the people who are running the elections,
5 what benefit, what disadvantages would that have for
6 them. If you could try one more time describing that,
7 it might peak their interest.

8 MR. WAGNER: Certainly. I think the number one
9 potential benefit for users might be that if this
10 enhances interoperability it might make it easier for
11 new voting technology to enter the market and
12 interoperate with the existing systems that you already
13 have.

14 So it might make easier for you to extend your
15 system with solutions from other vendors. It might
16 potentially increase the ability to mix and match
17 systems across multiple vendors so it might reduce the
18 barriers to entrance for small vendors. It might
19 increase competition.

20 So I think really the potential benefits for
21 election officials are kind of on the procurement and

1 the supporting of a market for innovative or new
2 solutions.

3 DR. JEFFREY: And the downside as you see it?

4 MR. WAGNER: The cost that I see here is that
5 we're adding one core requirement to the vendors, which
6 the vendors would have to implement.

7 I don't see this as a very expensive requirement.
8 It's not one of the most expensive requirements we've
9 considered but any time you add a new requirement of
10 course there is some additional burden on the vendors,
11 which translates into some addition cost for officials.

12 DR. JEFFREY: Paul.

13 MR. MILLER: I guess first of all I'm not sure,
14 haven't reviewed this in detail, but one, I'm not sure
15 that of the systems that I'm familiar with, that I've
16 worked with, that they don't already have some form of
17 an export.

18 Now the formats of those exports differ by vendor
19 and so I guess that's the first one. So I'm not sure
20 that they don't already have it.

21 Two, it seems to me that to truly get to require
22 that vendors be in a position where they're

1 interoperable, in other words you could use Sequoia's
2 touch screen along with Depold's central counter,
3 something of that nature, that you would have to define
4 some sort of -- it's EML, right, a markup language, some
5 sort of definition of what that structured data should
6 be that you can exchange and what the data fields have
7 to be in order to really get to where you want to get
8 to, if I'm understanding that correctly.

9 MR. WAGNER: Yeah, I think there's two levels
10 here of potential -- how far you could go, and the
11 extreme version which I'm not advocating and I'm not
12 suggesting is that this body could pick a standard that
13 all the vendors must support. And I am not advocating
14 that.

15 I think what I was suggesting that might be worth
16 considering is requiring that vendors have the
17 capability of export in some publicly defined format of
18 that vendor's choice. So that's not picking any
19 particular standard per se, that's allowing the vendor
20 to choose the export format.

21 And so what that might mean is, for instance if you
22 wanted to use equipment from vendor A with equipment

1 from vendor B, it wouldn't automatically mean they're
2 interoperable but it would reduce one barrier to
3 interoperability because if vendor A was required to
4 export their data in a publicly available format, now
5 vendor B could provide the in port capability if vendor
6 B chooses. Vendor A no longer has the veto power over
7 that.

8 So right now today I believe that many systems have
9 the export capability but I'm not sure that they're in a
10 publicly documented format.

11 MR. WILLIAMS: What you're recommending would
12 require (unintelligible) certification because right now
13 there's no provision for certifying a component of a
14 voting system.

15 MR. WAGNER: That was my next point.

16 MR. WILLIAMS: The quasi-essential voting station,
17 you couldn't get in certified unless one of the major
18 vendors would allow you to make it part of their system,
19 vis-a-vie the auto mark.

20 MR. WAGNER: I absolutely agree this requires
21 certification. I don't know enough about how the state
22 certification processes work.

1 MALE SPEAKER: I can speak to that point. First of
2 all the national certification is done -- all of the
3 components are an integrated system and first of all
4 they would have to be tested.

5 So this interoperability that you're talking about,
6 this using components from one vendor in combination
7 with vendors would first of all have to be tested at the
8 national level and approved at the national level before
9 at least my state could look at it.

10 MR. GANNON: This is Patrick Gannon. The comment
11 David was making about being published in open format is
12 what's specified in 16.6-A3, top of 16-74.

13 And where the wording for this change came about
14 was when we were discussing this particular section and
15 it had the words of interoperability and
16 intergratability, and I pointed out that simply allowing
17 vendors to use formats that are simply open and
18 published without agreeing upon a common set of formats,
19 you'll never achieve an interoperability.

20 And so the solution was remove reference to
21 interoperability as opposed to getting to commonly
22 agreed upon open published formats.

1 And the question of whether or not it's driving --
2 certainly it has a cost issue as I've heard from
3 vendors, that today there are requirements to export in
4 multiple formats because different states have chosen
5 different formats and they're doing that today.

6 And so there's an added cost that vendors incur in
7 creating and providing an export function and then
8 having to do it in multiple different formats, and as
9 new equipment comes on or a new format comes up, then
10 it's multiple output capabilities.

11 So the issue of having the common agreed upon
12 formats is seen as one that tends to drive down the
13 cost. It's something that is seen in many, many
14 different industries that have gone to that step of
15 agreeing upon, you know, common data formats to achieve
16 interoperability between different systems, whether it's
17 components or just different systems.

18 In the case of voting where you have systems in a
19 precinct or a county that have to have data rolled up
20 and sent to a state level, you know, there's often times
21 different systems involved there so that kind of
22 tabulated data export capability comes into play there.

1 And my understanding was as precincts and counties
2 are changing out equipment and the need to provide
3 accessibility features, et cetera, the mix and matching
4 is increasing as opposed to having a single vendor
5 solution throughout an entire state.

6 So the need for this is increasing and so the
7 question is, is the current revised version here that
8 deals only with intergratability sufficient for the
9 future needs of the voting community.

10 MR. FLATER: And if I could add to that, one of
11 the points brought out in the discussion on the STS call
12 was that -- I mean one of the rationales behind removing
13 the word interoperability here was to avoid giving a
14 false promise.

15 In fact what we have is not an interoperability
16 testing regime, what we have is a conformity assessment
17 process and interoperability cannot be achieved through
18 conformity assessment alone.

19 MR. WILLIAMS: I don't know who that was but --

20 MR. FLATER: Sorry?

21 MR. WILLIAMS: This is Brit. I don't who that was
22 speaking but I agree with him.

1 **(LAUGHTER)**

2 DR. JEFFREY: That was David Flater. Okay, that
3 horse hasn't moved for a while I don't think so we'll
4 keep kicking it. Is there concrete motion for a change
5 here? Okay. Yes.

6 MR. GALE: Mr. Chairman, John Gale, Nebraska.
7 Part of our problem is -- of course I received the
8 materials the day I walk in here. I don't have these
9 ahead of time and this is a different subcommittee then
10 I belong to so this is all new to me.

11 And I don't get the context of it, I don't get the
12 substance of it, I don't get the implications or
13 consequences of it so I'm not about to speak on behalf
14 of any election officials to say whether this is good or
15 bad because I am totally unable to at this point
16 comprehend the dimensions of this linguistic change and
17 to me it sounds like we're dealing with a linguistic
18 change with a lot of hidden consequences.

19 So as an election official I can't address it. I'm
20 not capable of addressing it. I will try to study it
21 tonight when I have the material in front of me, which I
22 didn't have before today, to try to get a grasp of it,

1 and I'll consult with other election officials who are
2 going to consult with me tonight to deal with some of
3 these issues, but to force this to a decision on this
4 isn't within our competence without more background.

5 DR. JEFFREY: What I'm looking for right now is
6 whether or not there was actually a proposal for a
7 change right now and at the moment I don't see a
8 proposal for a change. That may change tomorrow
9 morning, but for right now I was trying to reach closure
10 on the discussion for right now. Patrick.

11 MR. GANNON: This is Patrick Gannon. I'm not
12 proposing a change.

13 I will note one other point of cross-referencing is
14 that in the, I think it's volume five, section 3.5, we
15 have a section of interoperability testing.

16 So the question is, is that high level enough that
17 says at some point here's what's required to do
18 interoperability testing, but we're really not going to
19 recommend doing interoperability because
20 interoperability is no longer a goal.

21 DR. JEFFREY: The discussion of interoperability
22 testing was informative background to clarify this

1 distinction between conformity assessment and
2 interoperability testing.

3 Okay, any other questions for David? Okay, thank
4 you very much.

5 I think John, you're back up. And I believe we're
6 now on the e-poll book discussion.

7 MR. WACK: And now for something different.
8 Okay, I'm going to set this up and then I'm going to ask
9 Ron to weigh in and finish in on some things.

10 Here's what I'm doing. Basically the last meeting
11 I did a presentation on ballot activation, and ballot
12 activation is now being done by e-poll books.

13 We don't have requirements for e-poll books in the
14 VVSG. We have requirements for ballot activation. So I
15 just want to make that clear to you that we're really
16 here talking about ballot activation requirements and
17 not e-poll book requirements per se.

18 One of the reasons being that e-poll books also
19 handle aspects of voter registration which the VVSG does
20 not cover right now.

21 So that is the definition of the voting system we
22 have currently, and in general we say that voting

1 systems are not networked externally. You know, there
2 are voting systems arrangements that could involve
3 networking of components within the voting system but in
4 general these voting systems are not networked outside
5 of the polling site, so on and so forth.

6 And when we were talking about ballot activation
7 last time, we considered a number of requirements around
8 ballot activation that I think aren't worth repeating.
9 They make a lot of common sense.

10 You know, basically making sure that whatever token
11 -- the information written to whatever token that's
12 being used to activate the ballot includes only the
13 information that's required, that privacy leaks don't
14 occur, things of that sort.

15 But there was one larger issue that we brought up
16 and that was what do we do about the situation in which
17 perhaps you have a voting center and basically this
18 handles many precincts, and voting centers sometimes use
19 e-poll books that are networked externally to a central
20 database.

21 So now if we have the e-poll books activating the
22 ballot then we in effect have a device that's part of

1 the voting system that is now networked externally.

2 What should we do about that?

3 We discussed various threats, security reliability
4 and integrity based threats, and it seemed as if the
5 sense of the TGDC at that point was to say, well that's
6 okay, still let's put some more requirements to make
7 sure that security is addressed probably, and access
8 control and things of that sort.

9 But it seemed as if the sense of the TGDC was to
10 say at the last meeting that it is permissible to use e-
11 poll books to activate the ballot and at the same time
12 have them networked externally to common central voter
13 registration databases.

14 So since then STS considered this issue, this
15 specific issue, and talked about some alternatives and
16 ways of perhaps not networking them externally but still
17 allowing voting centers to do what they need to do,
18 which is essentially talk to a central database.

19 So the recommendation coming out of STS now is that
20 e-poll books not activate the ballot while
21 simultaneously being connected up to central voter
22 registration databases.

1 And Ron I think looked into this most carefully and
2 sent out some particularly relevant e-mail recently, and
3 if it's okay Ron, I'll just turn it over to you at this
4 point.

5 MR. RIVEST: Yeah, I think that the issue of
6 attacks over the network, we realize that they're not
7 just hypothetical but the fact that we've seen real
8 instances where voting systems have been brought down at
9 least temporarily by a network attack.

10 I passed around a news story to the TGDC mailing
11 list which talked about, I think it was slammer worm
12 that was attacking some of the databases in Sarasota
13 County on the day of election or very nearby there, and
14 caused serious disruption of services.

15 So these attacks are not merely hypothetical, and
16 given stories like that, real incidents like that, and
17 the discussion of the STS group -- these are hard
18 questions because there is functionality.

19 This is an important trade off here of trying to
20 insure that voters don't vote twice and so on, so some
21 connection with statewide database may be important, as
22 well as insuring that the operation of voting can be

1 robust and continue working in spite of various attempts
2 to hack in over a network or something.

3 In the end the STS came to a consensus that e-poll
4 books should not both be able to activate ballots and be
5 connected over the network.

6 So if you've got a machine that's connected to the
7 network, you assume that machine is compromisable
8 basically and therefore you don't allow it to play an
9 essential role in voting procedure by activating
10 ballots.

11 So that's our recommendation at this point. It is
12 a bit of a variance from the discussion we had
13 previously in the meeting and I think that's why it's
14 good to have this discussion again here.

15 But there is a risk here, so the STS subcommittee
16 is recommending that we draw a line and say that if the
17 poll book is networked externally then you need to have
18 some other mechanism to activate the ballot which may
19 involve the poll worker using a separate device to
20 activate a token or something like that. These things do
21 exist in the market. Clearly there's a trade off.

1 You may have accuracy issues with the poll worker
2 doing something like that. You have additional benefit
3 of being able to tell that somebody hasn't voted before
4 and then they can vote more freely in a number of
5 different stations perhaps or poll sites, but then you
6 have the extra cost of having to have the poll worker
7 take an extra step to activate the ballot somehow.

8 But that seemed to be the right place to draw the
9 line based on our committee discussions. But I think
10 it's a good topic for wider discussion here at the TGDC.

11 MS. QUESENBERRY: Ron, it's Whitney. Is that any
12 different then what we have now? In my jurisdiction we
13 have paper-based poll books. So you've got a paper poll
14 book, you're marked off in that poll book, and they do
15 something else as a separate device to activate the
16 ballot.

17 MR. RIVEST: It's (unintelligible) what many
18 jurisdictions currently do.

19 MS. QUESENBERRY: Now the poll book would be
20 electronic instead -- and so what we're really saying
21 is, it seems so cool that we would be able to just
22 connect them up but there's good reasons not to?

1 MR. RIVEST: Yeah.

2 MR. MILLER: This is Paul. To be clear, and I
3 don't think that this is a huge issue, and Ron correctly
4 pointed it out, I think the major advantage -- we're
5 addressing a very specific situation. One, that these
6 are externally networked so they are available in a wide
7 area and the primary advantage that I would see to
8 allowing this would be the issue of insuring that the
9 voter gets his activation device activated correctly.

10 I the poll worker is going over to another device
11 and typing in what the code is and that's really -- you
12 know, you've rightly brought out I think that that
13 feature is actually a move forward.

14 It can be seen in one arena as a move forward
15 because right now what election workers do is yeah, you
16 sign in that paper ballot and the poll worker has to
17 either hand them the right ballot, and believe me they
18 don't always, or issue them the right code, and mistakes
19 are made there. So being able to activate it directly
20 off of the database is an advantage.

21 Now really the only environment in which I see this
22 coming into play is when you're using regional centers

1 or early voting, because usually on election day you've
2 defined who can go to that polling place.

3 So you could either have a device that has the
4 names of only the people that are eligible to vote at
5 that polling place, and now could issue the code and
6 still meet your requirements because it's not connected
7 to the outside world.

8 I have a question. I think my recollection from
9 the last meeting is that we discussed being able to
10 limit what the token could store so that they couldn't
11 store anything that might be potentially damaging to the
12 voting device.

13 MR. RIVEST: Yeah, we talked about that too at
14 the last meeting and in committee, and I think the
15 consensus of the committee under discussion was that
16 that was a very difficult road to hoe, that the
17 technology seems to be marching ahead to these larger
18 devices.

19 You know, it's not inconceivable that you could do
20 something there, but even then, you know, you've got a
21 corrupted poll book feeding information to voters about
22 what precincts they belong to and so on too. It's a

1 major threat to the integrity of what's happening on the
2 election.

3 So I felt an error gap was probably a better thing
4 there. Maybe David can recall some more of these
5 discussions but my recollection is that we felt that
6 this was not a viable mitigating mechanism for these
7 kinds of attacks.

8 FEMALE SPEAKER: It sounds like they didn't pan
9 out.

10 MR. RIVEST: Yeah, yeah, it was --

11 MR. WILLIAMS: Ron, did you all delineate the
12 threats that would occur by this network database, you
13 know, what threats could possibly occur to the voting
14 system? For example, I don't see how anybody could
15 introduce any fraudulent code for instance into a voting
16 station through this mechanism. All I can see that they
17 might do is corrupt the registration database.

18 MR. RIVEST: If the ballot activation station is
19 totally corrupted and you've got a one gigabyte thumb
20 drive as your ballot activation device, you know, you've
21 got a channel there for passing large amounts of
22 information to the voting station, and if there's an

1 overflow attack on the voter station you've got a real
2 problem.

3 So this sounds like a difficult road to hoe but
4 security systems have been broken with much sort of
5 narrower windows of vulnerability.

6 MR. WILLIAMS: But sometimes I think we're seeing
7 ghosts. Let me ask you this, isn't this question vetted
8 extensively in the election community? Didn't you send
9 this out for comments to a number of elections
10 officials?

11 MR. RIVEST: I'm not sure which part you're
12 talking about. We had an open meeting with the minutes
13 that were distributed. I distributed this news report
14 about the actual network attack that happened in
15 Sarasota.

16 MR. WILLIAMS: I got from NIST or somebody, I know
17 of some election officials that were asked to comment
18 that were (unintelligible) and were asked to comment.

19 MR. RIVEST: That's right. The Election
20 Assistance Commission helped us out. We got some good
21 feedback. I wouldn't say it was extensive but it was

1 helpful and the feedback in general -- well I'll just
2 offer you an opinion.

3 I think that a number of the election officials who
4 answered it mistook it as basically a question as to
5 whether e-poll books should activate the ballot period,
6 and I'm not sure that the questions of whether they
7 should activate the ballot and at the same time -- I'm
8 sorry, if they should activate the ballot and
9 simultaneously hook up to an external network was well
10 considered.

11 My memory may not be so good but I thought I
12 recalled in some of the more recent STS discussions,
13 some discussion of alternatives that didn't necessarily
14 preclude having an e-poll book at a voting site or a
15 voting center, and perhaps that e-poll book periodically
16 being refreshed and refreshing the central database.

17 You know, I guess what I'm trying to say is I seem
18 to recall that there were some discussions where people
19 seem to think that that was a feasible approach.

20 It didn't necessarily mean that there was just a
21 total ban on e-poll books being used to essentially
22 update a external database and also in a sense handle

1 the local needs. Does that ring a bell in anybody's
2 mind?

3 MALE SPEAKER: It certain was the case that there
4 was no discussion of banning e-poll books. Those
5 provide a valuable service in these kinds of contexts.

6 Brit's talking about threats too. If you've got a
7 network externally I mean just to deny a service attack,
8 if you've got a virus or some kind of -- just like the
9 slammer worm is going around in this story that we
10 passed around. If all the e-poll books can be
11 deactivated by some attack over the network you've got
12 to have some back up procedure for activating the voting
13 stations anyway I would think.

14 DR. JEFFREY: Secretary Gale.

15 MR. WILLIAMS: Yeah, you always have back ups, but
16 let me give you a scenario.

17 Let's say that I don't connect the e-poll books
18 during the election but I connect them up to download
19 the data. Then I connect it to voting system to
20 activate the ballot. Isn't that just as dangerous?
21 Couldn't this have code, this (unintelligible) that

1 they're in, the e-poll book waiting for me to connect it
2 to the voting station?

3 MR. WAGNER: Yeah, great question, Brit. Dave
4 Wagner here. I have a slightly different view on that.

5 So from a security point of view, what you're
6 talking about I believe would likely happen within a
7 county warehouse.

8 The e-poll books might be connected up within a
9 county network and it was under the county's control so
10 that would obviously be much less of a security issue.
11 I wouldn't be worried about security of that.

12 I'm a computer security person but I would like to
13 suggest we don't get too caught up in just the security
14 aspects of this.

15 I think that from a realistic practical -- what
16 kinds of failures we might see, maybe an even more
17 serious concern is the reliability concern.

18 When you're externally networked, if you are
19 relying upon the network and that central database to be
20 working correctly to be able to activate that ballot,
21 that means that if your network fails or the central
22 server fails then throughout the county or throughout

1 the jurisdiction, you can't activate ballots and you may
2 not be able to use your voting system.

3 So that single point of failure is a reliability
4 risk and I think that's where this concern about being
5 externally networked -- that's an additional concern
6 about being externally networked and doing ballot
7 activation that applies if you're externally networked
8 on election day, but it doesn't apply if you're just
9 loading the e-poll books up with the data before or
10 after the election.

11 MR. WILLIAMS: I'm going to have to back up for my
12 registration data. You know, you don't allow single
13 point failures anywhere, but it concerns me that you're
14 taking a simplistic approach. You're saying because it
15 would be difficult to secure this device we're just not
16 even going to attempt it.

17 DR. JEFFREY: Secretary Gale and then Paul.

18 MR. GALE: Well I agree with both comments of
19 Brit and of Paul that we discussed this. I thought we
20 resolved it reasonably.

21 I'm opposed to attempting to go back and address e-
22 poll books. I think we need to maintain flexibility for

1 our election workers, both on the precinct level and on
2 the state level.

3 We're talking about guidelines here. We're not
4 talking about equipment today, we're talking about
5 guidelines for equipment five years from now or four
6 years from now and every time there's any kind of attack
7 the industries always come forward and figure out ways
8 to address those attacks whether it's SPAM, or whether
9 it's viruses, or whatever the attack might be.

10 And if there is a vulnerability here I think it
11 will be addressed in the course of time by industry or
12 by experts, but the e-poll book I think has served a
13 very, very valuable and useful tool on the local level
14 by those who are handling both the voter registration
15 and also the ballot validation.

16 So I think I agree with Brit, we're worried about
17 ghosts. I think you can take any of these things to a
18 theoretical level and find things to fear on all levels
19 but life goes on.

20 We've been dealing with challenges on a lot of
21 different levels in over 200 years of elections and
22 we've got to focus on what's going to be not just a

1 perfect machine but how you're going to interface your
2 election community and the equipment they're using on a
3 lot of different levels across the country. I think
4 this is a very valuable too and we should allow it.

5 DR. JEFFREY: Paul, then David.

6 MR. MILLER: One, I think it's really clear that
7 the e-poll books that are polling place based are a
8 valuable tool and I think none of us are arguing on that
9 one, but the question is really -- it seems to me that
10 you're actually hitting on a broader question that we
11 may have to address, which is -- David, your argument
12 was an excellent one for taking a serious look at
13 networked polling place devices or e-poll books.

14 There's got to be a contingency plan if that
15 network gets slammed and you get a denial of service
16 attack on it. You're absolutely right about that, but
17 there could be a denial of service attack and that still
18 wouldn't affect how the piece that gets authenticated
19 and goes over the voting machine, no tie there.

20 So I think that the network e-poll books are a
21 really good idea, are something that's needed for
22 regional centers and early voting.

1 You know, I think that's been a boon to our process
2 and our election process. The question is how to secure
3 it. I'm not confident this is the absolutely right way
4 to secure it.

5 MALE SPEAKER: If I may respond to that. So the
6 argument is not about network e-poll books. I mean
7 those definitely have value. The questions is whether
8 they should also be the ones that are creating these
9 ballot activation devices.

10 And so if you've got a choice between trying to
11 create a useable robust separate ballot activation
12 device between that choice, and trying to secure the
13 network e-poll book, I mean a security person will tell
14 you there's no question which one is an easier task to
15 take on.

16 MR. WAGNER: Dave Wagner. Yeah, I want to make
17 sure we don't have a perception there that we're talking
18 about academic, theoretical, hypothetical scenarios that
19 are way off in the atmosphere.

20 The reliability risks here are real and in fact
21 they have happened and they happened in one of the first

1 few jurisdictions to deploy network e-poll books on a
2 wide scale.

3 In Denver we had a well publicized incident where
4 it was one of the first places to use network e-poll
5 books on a large scale. They had a very serious failure
6 where the servers got overloaded and as a result there
7 were large delays in how the voters were able to use
8 those and that had a significant impact on the election.

9 Now if we had a total network failure, if the
10 network had failed and those e-poll books weren't
11 working at all, and if those e-poll books were also used
12 for activating the ballot then you wouldn't be able to
13 use your voting system to vote and that has a very
14 severe impact.

15 So I think we need to think carefully about the
16 reliability implications of network e-poll books that
17 are also used for ballot activation.

18 There's no question the network e-poll books have
19 value. I think the issue is just should we be using
20 them for activation.

1 MR. WILLIAMS: What you just described in Denver is
2 not a security issue. It's an operational issue and
3 operational issues can be addressed and solved.

4 MR. WAGNER: Dave Wagner. Again, I agree this is
5 not a security issue at all. That's why I described
6 this as a reliability issue.

7 Unfortunately it's challenging when you have a
8 single point of failure that is an inherent risk from an
9 engineering point of view, and we're talking about
10 systems that are based upon a single point of failure,
11 based upon relying on the network to be working. That's
12 a challenge.

13 FEMALE SPEAKER: David or Ron, I'm sorry, I may
14 be completely wrong about the technology but if it was
15 not using a public network but a private network, would
16 that make a difference?

17 MR. WAGNER: David Wagner. In principle it could
18 potentially make a significant difference.
19 Unfortunately the direction we're heading is that there
20 really are no private networks anymore. The private
21 networks are carried on the public network.

1 FEMALE SPEAKER: Okay, so it's really all the
2 same thing.

3 MR. WAGNER: So it's difficult. That may be a
4 tough angle to take.

5 DR. JEFFREY: Any other comments or questions on
6 this?

7 I've actually got a question for Brit. You
8 mentioned that no system should have a single point
9 failure and David made a compelling argument that by the
10 way that we've introduced this, that we've introduced a
11 potential single point failure.

12 Based upon that, it seems that if we ignore
13 security for a second, that there may need to be a
14 requirement that the voting system should be able to
15 operate independent of a network e-poll system, so that
16 means that they fact key in the right information or
17 whatever, but the connection between the network e-poll
18 and the voting system does seem to be a single point
19 failure mode.

20 It doesn't handle the security issue because it
21 doesn't forbid them from using a network e-poll system
22 to activate, but if that network goes down, that there

1 needs to be a back up system. And I think that's sort
2 of what you described, that's sort of a no-brainer, that
3 that's something that people --

4 MR. WILLIAMS: That's a no-brainer, but you can
5 provide backup for your registration database and that's
6 what you're talking about. If the network goes down,
7 what this means is that if you vote in one poll center I
8 won't know about it in another polling center.

9 Well, there are ways to get around that and there
10 are ways to transmit that data in the event that the
11 network goes down, but the point here is that this e-
12 poll book is a very, very significant part of the future
13 of elections.

14 DR. JEFFREY: This is Bill. I agree with that.
15 The point would be if one set up a voting system that
16 required an operational networked e-poll system, then
17 you have a problem, you've gotten rid of that back up
18 that you would want.

19 So the question is whether or not we have over-
20 prescribed in some sense the situation. We may want to
21 back out a bit by specifically calling for the fact that
22 there needs to be a back up if the network goes down and

1 that could be as much as just fact fingering the
2 information in.

3 MR. WILLIAMS: Yeah, there needs to be a back up.
4 And by the way there are some states that still have
5 private dedicated networks. We have one in the state of
6 Georgia.

7 But be that as it may, what I'm saying is that to
8 just summarily say that you can't use this device the
9 way it's intended to be used to me is unacceptable.
10 We've got to do better than that folks. We've got to
11 come up with ways to help people get their job done.

12 DR. JEFFERY: That's a good point, Brit. This is
13 Bill again.

14 What I might suggest is perhaps a -- I know this is
15 not really a security requirement but this is an STS led
16 initiative. I might recommend that STS go back and try
17 to craft a requirement that talks about the back up
18 capability.

19 So if the network goes down, regardless of why the
20 network goes down, whether it's do to power failure,
21 whether it's due to a denial of service attack, whatever

1 reason, that the voting system should still be able to
2 be activated. Is that fair?

3 MR. WILLIAMS: Well I'm not pretending to tell STS
4 how to solve the problem. I am saying that the solution
5 they've come up with I think is (unintelligible).

6 DR. JEFFREY: This is Bill. I am actually
7 suggesting how they solve the problem.

8 **(LAUGHTER)**

9 MALE SPEAKER: Well, there are two issues. One is
10 the reliability issue and having a back up system --
11 (Tape interrupted while changing sides)

12 **(END OF AUDIOTAPE 3, SIDE B)**

13 * * * * *

14 **(START OF AUDIOTAPE 4, SIDE A)**

15 MR. WILLIAMS: -- We don't need STS to solve that
16 part.

17 DR. JEFFREY: This is Bill. I guess what I'm
18 suggesting to STS is that they solve the reliability
19 issue and that would still allow networked e-poll
20 systems.

21 And so regional voting systems would still be able
22 to use the advances that have occurred, but if that

1 network goes down either due to reliability issues, due
2 to even the suspicion of an attack or denial of service,
3 the system continues to operate, but when everything is
4 green it's operating exactly as designed. It doesn't
5 solve the subtle security issues. It does solve the
6 reliability issue.

7 MR. WILLIAMS: One of the things that has not been
8 taken into consideration here is that that external
9 ballot activating device you're talking about where a
10 human being intervenes to activate, to identify a ballot
11 style, and activate a ballot is the weakest link in most
12 DRE voting systems.

13 And to have that automated where the poll book
14 automatically goes into the voter registration database,
15 looks at where you live, determines what ballot you're
16 entitled to, and automatically issues it without
17 introducing the human error is considered a great boon
18 to elections.

19 MR. WAGNER: David Wagner. Thank you, yes, I
20 agree, there's a potential for significant advance here.

1 I would actually point out that from an engineering
2 point of view, 99 percent of common cases are actually
3 very easy to handle.

4 The case that involves ordinary polling site voting
5 where a voter can only go to their own polling site is
6 very easy to handle and we can provide the functionality
7 that you're talking about, Brit, without having a
8 network at all. And so that just takes all the security
9 and reliability issues off the table. It's a very clean
10 and simple solution and you always like the clean and
11 simple solutions because they are very reliable.

12 The really tricky bit is when you have vote centers
13 who are multiple early voting locations where voters can
14 choose to go to multiple different locations. If you
15 want to be able to prevent someone from voting at more
16 than one place on the say day for instance, then you
17 need some kind of communications between them.

18 And so I think that is where we're really
19 struggling to find a solution that can accommodate that
20 and that answers all the security and reliability
21 issues.

1 MR. GALE: This is John Gale. Dave, does it
2 make any difference if the local jurisdiction is using a
3 closed system, in other words only accessible by
4 password from each of the locations that have the e-poll
5 book?

6 Does that reduce the risk that you're talking about
7 or is it just as vulnerable in that kind of a closed
8 system as if it's just open to the Internet? I'm not
9 sure I know what level we're talking about here.

10 MR. WAGNER: There's no proposal that any of
11 these systems be open to the Internet. They are closed
12 systems in the sense that authentication is required to
13 get around to them, but they still are networked and
14 these systems have vulnerabilities and sometimes things
15 are connected to the Internet that you didn't know were
16 or something like that.

17 We hope that never happens but once you start
18 having networking out of the control of the precinct
19 then something that's far away in county headquarters or
20 something, that may have a vulnerability that will cause
21 you problems. It's certainly the case that you want the
22 password and some of the kinds of things you're talking

1 about, those are protections that are necessary but that
2 doesn't remove all the vulnerabilities.

3 MALE SPEAKER: May I ask a question, John? I think
4 I'm jotting down the instructions. We basically in a
5 sense said no radio frequency wireless and I take it STS
6 would need to go back and take a look at that, and it
7 seems to me as if e-poll books present a bit of a
8 dilemma. I would suspect that radio frequency wireless
9 is being used more then likely to hook up to the
10 external databases.

11 MR. WILLIAMS: Not that I'm aware of.

12 MALE SPEAKER: It could be. My guess is that they
13 would be typically wired though. Certainly no radio
14 would apply to them I think in terms of how the
15 standards are written, but the typical usage these days
16 I think would be a wired implementation.

17 MALE SPEAKER: I'm thinking about the case of
18 Broadband basically modem cards that you can stick into
19 PCMCIA slot that are becoming more popular as a way of
20 mobile connectivity.

1 But it sounds to me as if STS needs to go back and
2 consider this a little bit longer and come back with
3 another proposal.

4 DR. JEFFREY: This is Bill. My recommendation is
5 perhaps the STS really (unintelligible) down into what
6 is the minimum necessary to insure reliability and
7 integrity, and then what additional suggestions might be
8 brought to the TGDC to adjust the additional security
9 issues and maybe handle those as two separate issues,
10 because my sense is the committee is probably in favor
11 of one and not quite convinced on the second, and so
12 they probably need to come back on that.

13 MALE SPEAKER: So if I understand correctly, you're
14 looking for proposals though that will address the
15 security issues, not just passing on the security
16 issues.

17 DR. JEFFREY: `This is Bill. I think it would
18 certainly be fair for you to not necessarily give up if
19 you're not ready to give up, but you probably need to
20 come back with one more try.

21 MALE SPEAKER: It looks like we've covered that
22 slide there.

1 **(LAUGHTER)**

2 So at this point I am done and I guess I'll turn it
3 back to you.

4 MALE SPEAKER: Thank you, John. One of the things
5 that I asked if the NIST folks could put together for
6 your homework assignment for tonight is a list of all of
7 the chapters and sections that we believe are ready to
8 be approved and then those sections that still have
9 further discussion that cannot be approved tomorrow and
10 so that way you can concentrate your 750 page reading
11 assignment tonight on maybe only 740 pages.

12 **(LAUGHTER)**

13 And so were we able to get hard copies? I mean I'm
14 not sure that everyone should be writing if it's
15 possible to make a quick hard -- I might suggest you
16 make hard copies, that way people can actually go --

17 MR. WILLIAMS: Can you put it up on the Internet?

18 MALE SPEAKER: Yes, it will also be put on the
19 website.

20 MR. WILLIAMS: (Unintelligible) secure Internet?

21 **(LAUGHTER)**

1 MALE SPEAKER: And on the public website too. Just
2 a show of hands since we're going to be taking a lot of
3 votes tomorrow, anybody here physically in person who
4 won't be available tomorrow morning? Okay. And Brit,
5 are you going to be available tomorrow morning?

6 MR. WILLIAMS: Certainly initially. Depending on
7 how things go, I might have to cut out after a couple
8 hours.

9 MALE SPEAKER: Okay. Alice, are you still on?
10 Okay, we'll check with Alice. I just want to make sure
11 that we maintain a quorum for the votes.

12 FEMALE SPEAKER: If we give Alice a few minutes
13 warning she can join us but we just need to give her
14 some warning. And I think the morning was easier for
15 her then the afternoon but I'm not sure.

16 DR. JEFFREY: So it sounds like we'll have a
17 quorum plus an extra three or four, which is good.

18 MR. WILLIAMS: If I'm not here I'll give Mark Skall
19 my proxy.

20 **(LAUGHTER)**

21 DR. JEFFREY: The Chair overrules that.

1 Okay, for those on the phone they're putting up on
2 the screen for us the different sections, and again this
3 will be put on the web as well, the C thing.

4 Okay, John or Mark, do you want to kind of walk us
5 through the matrix?

6 MALE SPEAKER: Okay, let's start with the easiest
7 which is volume one and there are no requirements there.

8 And chapter two definitions, I think that we
9 obviously don't have any requirements there but it's
10 something that we would put up to you as material that
11 we think is ready to give us the editing --

12 FEMALE SPEAKER: Do you just define yes, no, and
13 partial?

14 MALE SPEAKER: Yes, no, and partial. Well could I
15 --

16 MALE SPEAKER: What's the human factors?

17 FEMALE SPEAKER: A good example of plain
18 language where the words are plain but the meaning
19 isn't.

20 FEMALE SPEAKER: I might have to work on that
21 but it might come to me naturally.

1 Yes, means that there have been no changes that
2 have been discussed here, so as written, you're passing
3 the editing token to NIST. There will still be changes,
4 references, editorial, some things moved around.

5 MALE SPEAKER: So the yes, no in answer to the
6 question, is this chapter ready to be voted on?

7 FEMALE SPEAKER: Yes. Partial means it is ready
8 to be voted on with the exceptions, and I note there
9 that 322-D is not voter verification but notification,
10 if you see that, that we called out a couple of
11 requirements that we specifically wanted to make changes
12 on but everything else would go to NIST for editing.

13 But we would make those changes -- some of them are
14 specific changes to be made and some of them are
15 specific issues still to be addressed like Bill -- you
16 all wanted to address the voter notification issue a
17 little bit more.

18 However on some of the no ones we do want votes, so
19 this is the general direction you wish us to continue in
20 but it is not ready to pass the editing token to NIST.

21 MALE SPEAKER: This looks pretty clear to me. Do
22 you want to just take a quick look through and then any

1 questions we can answer, but this looks like a pretty
2 clear summary.

3 So we left off at three, and partial meaning that,
4 you know, you see the except for, the numbers missing
5 from the performance, and so on and so forth.

6 MALE SPEAKER: Could we go down a little bit
7 farther? Okay, can we go back up to chapter four,
8 security and audit architectural requirements, so we're
9 saying yes.

10 Electronic records requirements, yes, to be
11 presented Tuesday. Okay, that's what I alluded to
12 earlier. We are going to resend out the slides we
13 presented last time and Bill Burr and I will take a look
14 at those tonight and see if there are any additional
15 slides, material that needs to be added tomorrow
16 morning.

17 Okay, going down through --

18 MR. WILLIAMS: Chapter six has that word in it
19 again.

20 MALE SPEAKER: Chapter six, voter verifiable.

21 **(LAUGHTER)**

1 MALE SPEAKER: Okay, and then we had the discussion
2 about cut sheet summaries, whether they ought to extend
3 across pages, PCOS batching, whether that's something
4 that can be done.

5 The question about whether the human readable text
6 shall be machine readable as well.

7 And change VVPAT comparison to if --

8 FEMALE SPEAKER: (Off microphone,
9 unintelligible).

10 MALE SPEAKER: All right. Going down through six,
11 seven, cryptography, yes, set validation, yes.

12 Can you keep going down through eight? Okay,
13 Nelson brought up the issues there whether 9.3.3 and
14 9.3.6 were the proper place for some of these
15 requirements.

16 Chapter ten, access control scope. Nelson brought
17 up that there was an issue of the applicability of some
18 of the requirements to multi purpose, general purpose
19 operating systems if a limited operating system was
20 being used.

1 Systems integrity management, chapter 11, no, but
2 we need to vote on general direction as well as chapter
3 12.

4 Chapter 13, yes, system event logging.

5 Chapter 14, physical security, no. Should there
6 also be a we do need general direction or general
7 agreement on the direction?

8 Barbara actually if you don't mind, how about if --
9 you'll probably do a better job with this.

10 FEMALE SPEAKER: On the (unintelligible) we have
11 some changes to make, but there are enough changes that
12 I would think you would want to see it again. So that's
13 why I put that one as a no. We have some general
14 direction changes that are clear that we'll act on, but
15 the changes were kind of significant enough that we'll
16 bring it back to you.

17 And then 16, yes.

18 MALE SPEAKER: 16 needs a no about miss-feeds for
19 EMBs.

20 FEMALE SPEAKER: Miss-feeds for EMBs. Dave is
21 adding that one in. That would be a partial, yeah.
22 Change that to partial.

1 MR. MILLER: This is Paul. On chapter 15, if I
2 were to have a question about whether or not those
3 documents should be subjected to public disclosure,
4 would that be an issue taken up here or at a later point
5 in time?

6 FEMALE SPEAKER: Dave, don't you have some
7 description for the TDP, how much of that is public?

8 MALE SPEAKER: These are separate issues at the
9 moment. The discussion that's in volume four about the
10 TDP has to do with what is vendor proprietary.

11 A new discussion has just erupted about so called
12 security sensitive information which although the
13 resolution might be similar to what's currently in
14 volume four, this is a new issue.

15 FEMALE SPEAKER: So let's put that one then with
16 a partial -- switch 15 to a partial and put the issue of
17 how much is public. That's a good one.

18 FEMALE SPEAKER: And just to make sure I
19 remember this, and 15 is actually moving into volume
20 four?

1 FEMALE SPEAKER: Yes, but that one is actually
2 editorial. The content will stay the same, it will just
3 get shifted around.

4 Okay, 16, we've got the correction on that one.
5 17, did we end up changing anything in 17 from our
6 discussion in the afternoon? No, we didn't.

7 So 18 was a reliability one in --

8 MALE SPEAKER: There's currently a benchmark in 17.
9 When the scope of that is broadened it will logically
10 move to chapter 16. So if you'd prefer --

11 FEMALE SPEAKER: No, it's the issue that's
12 important. Yeah, we made a few changes Thelma while you
13 were gone.

14 MALE SPEAKER: You guys still have one in HFP? Did
15 that move down or not? It's all fixed.

16 FEMALE SPEAKER: You fixed the one from HFP?
17 Well let's keep going down because there are a few more
18 chapters left after 17. Isn't there an 18? The
19 reference model, that's a yes, like the role model is
20 actually currently in the access chapter. It will move.
21 And so you see the note for volume four, that's a yes,

1 but some material will be gleamed in from the other
2 chapters and moved into four.

3 And five I think was a yes also.

4 So when you look at these tonight, if you have some
5 area where you have an issue, bring that back up
6 tomorrow so we can address it.

7 MALE SPEAKER: We didn't set a requirement for the
8 page breaks.

9 DR. JEFFREY: Okay, with that I think that we're
10 actually done for today. Thelma will take this and make
11 new copies with these changes. And we're actually an
12 hour early today so you've got more time to read all 750
13 pages and to go through that in detail.

14 The bus to the hotel will be leaving at five
15 o'clock. Is that right?

16 MALE SPEAKER: Probably a little after five.

17 DR. JEFFREY: So that will give us time to get the
18 copies and get that distributed to you. So please don't
19 leave today without a copy of this page to help you with
20 your cheat sheet tonight.

21 So with that and for the people on the phone, thank
22 you very much. This will also be posted on the web.

1 And we will reconvene tomorrow morning at 8:25 a.m. or
2 8:30 a.m. See you in the morning.

3 (END OF AUDIOTAPE 4, SIDE B)

4 * * * * *

5

6

7

8

9

10

11

12

NIST

13

TGDC MEETING, DAY TWO

14

TUESDAY, MAY 22, 2007

15 (START OF AUDIOTAPE 5, SIDE A)

16 MALE SPEAKER: Is anyone on? I heard someone come
17 on but alright. We will move forward here and hopefully
18 Brit and/or Alice will join us as we move forward.

19 Just the usual that we went through yesterday. We
20 are in the employees' lounge. Welcome back to the 22nd
21 of May TGDC meeting. If we have an emergency for those
22 who weren't yesterday and for the public, you just go

1 out these doors and take a right, walk down and you will
2 see the glass doors on your right. If there is an
3 emergency the bell rings over here and gets bright and
4 also makes lots of noise. This has happened before.
5 You won't have any reason to think there is anything but
6 an emergency going on. We do have fire drills on
7 occasion.

8 For those who need the services of a signer, over
9 on my right, your left is the signer and please sit over
10 here if you need the service. They will be here through
11 the whole meeting.

12 Same as yesterday, please turn off all cell phones
13 and pagers, wear your badges, and I would give everyone
14 at least a B+ or A- yesterday on identifying themselves.
15 There were some lapses but you are getting much better.
16 As we get to our 10th meeting we get better at these
17 sort of things.

18 I have handed out a sheet to everyone for possible
19 dates for a public meeting on June 28th or 29th. If you
20 can either email me or give them to me by the end of the
21 day. I have extra forms if you don't -- if I misplaced

1 it or it fell off somewhere. So just get to me on that.
2 That is all that I have Dr. Jeffrey back to you.

3 DR JEFFREY: Thank you. Obviously there is some
4 great inflation. I would have given them a B+ at best.

5 Let's first -- would everyone stand for the Pledge
6 of Allegiance.

7 I pledge allegiance to the flag of the United
8 States of America. And to the republic for which it
9 stands, one nation, under God, indivisible, with liberty
10 and justice for all.

11 DR. JEFFREY: I would now ask Parliamentarian
12 Thelma Allen for the roll call.

13 MS. ALLEN: Good morning. Williams? Williams?
14 Williams is not attending. Wagner?

15 MR. WAGNER: Here.

16 MS. ALLEN: Wagner is present. Paul Miller?

17 MR. MILLER: Here.

18 MS. ALLEN: Paul Miller is present. Gale?

19 MR. GALE: Here.

20 MS. ALLEN: Gale is present. Mason?

21 MS. MASON: Here.

22 MS. ALLEN: Mason is present. Gannon?

1 MR. GANNON: Here.

2 MS. ALLEN: Gannon is present. Pearce?

3 MR. PEARCE: Here.

4 MS. ALLEN: Pearce is present. Alice Miller?

5 Alice Miller? Alice Miller is not here. Purcell?

6 MS. PURCELL: Here.

7 MS. ALLEN: Purcell is present. Quesenbery?

8 MS. QUESENBERY: Here.

9 MS. ALLEN: Quesenbery is present. Rivest?

10 MR. RIVEST: Here.

11 MS. ALLEN: Rivest is present. Shutzer?

12 Shutzer? Shutzer is not attending. Jeffrey?

13 DR. JEFFREY: Here.

14 MS. ALLEN: Jeffrey is present. We have 10 in

15 attendance. We have enough for a quorum. Thank you.

16 DR. JEFFREY: Thank you very much. Okay. Let me

17 go through sort of hopefully my expectations for today

18 which is a little but different then how we left last

19 night.

20 Each of the chapters still require a significant

21 amount of technical editing, cleaning up, cross

22 referencing a lot of section removing so what we would

1 like to do is get a vote today on whether or not the
2 TGDC feels comfortable with the technical guidelines in
3 general for the CRT section and for the HFP section or I
4 should say sections. The STS, there are obviously a
5 number of action items that went back to the committee
6 yesterday so we should wait on that.

7 And following that then the technical editing
8 should really begin. We should really clarify all the
9 sections, make sure that all the definitions are
10 accurate, that all the material is captured in the right
11 place. And then as each chapter gets sort of cleaned
12 up, we would recirculate that to get any additional
13 comments, questions on that. And it should be a red
14 line version so people can see the changes, for whoever
15 will have configuration control.

16 And then what we plan to do at the next TGDC
17 meeting which hopefully will be around the end of June,
18 probably that will be by telecom, so again open to the
19 public, is when we will do the final sort of chapter by
20 chapter confirmation/affirmation of approval. So that
21 way all of the editing will be done, that there will be

1 no chance of any subtle changes that occurred that
2 weren't meant just by changing the grammatical meaning.

3 So today, again, I would like to try get the top
4 level affirmation that we are sort of on track on the
5 HFP and CRT. And then after that I will ask John Wack
6 to come up to go through some of the remaining issues
7 that they need guidance on, on the STS sections so they
8 can put those to bed, outside some of the discussion
9 that we had yesterday.

10 With that, are you all in general agreement that
11 that is a good approach for today? Okay.

12 So with that, actually I am going to ask the TGDC
13 members for the HFP, -- we might as well start there,
14 would you like to make a proposal or resolution?

15 FEMALE SPEAKER: I do want to draft resolutions.
16 Well I guess my feeling about the HFP section and the
17 sections that are in other chapters is that I think the
18 list that we drew up yesterday of the few pieces of
19 language we are still working on and the one big piece
20 of benchmarking work that we are working on, is still
21 correct. It is still a pretty aggressive schedule behind

1 the scenes for anybody that thinks that filling in that
2 one word is going to be easy.

3 So I would like to suggest that the committee --
4 what is the wording you would like Dr. Jeffrey?

5 DR. JEFFREY: (Off microphone). Go ahead.

6 MR GALE: I think to move things along and at least
7 get something on the table for discussion, I would like
8 to move that TGDC as a preliminary and conditional
9 approval of the Human Factors in Privacy Sub Section
10 adopt it subject to the technical revisions necessary
11 and also obviously subject to the final work being done
12 on the performance bench mark research that has not been
13 completed.

14 So in a sense I may need to rephrase it, but in a
15 sense what I am saying is this is a preliminary
16 conditional approval of the Human Factors and Privacy
17 sections of the draft VVSG to advance it forward to the
18 technical editing, completion of the benchmark
19 performance research and a final review at the
20 teleconference.

21 FEMALE SPEAKER: Allan are you okay there?

1 DR. JEFFREY: If I could see if this captures it,
2 the TGDC grants preliminary and conditional approval for
3 the HFP sections, subject to final review of the edited
4 and updated material.

5 MR. GALE: That would be my motion.

6 MALE SPEAKER: Second.

7 DR. JEFFREY: So we have a motion and it is
8 seconded. Allan did you get -- let me read this again.
9 The TGDC grants preliminary and conditional approval for
10 the HFP section subject to final review of the edited
11 and updated material.

12 MALE SPEAKER: After HFP sections, could you read
13 that again, please?

14 DR. JEFFREY: Subject -- HFP sections, subject to
15 final review of the edited and updated material.

16 FEMALE SPEAKER: Dr. Jeffrey, do we want to
17 actually enumerate those sections?

18 MALE SPEAKER: I would going to ask if we could use
19 the HFP sections on a matrix --

20 FEMALE SPEAKER: So I think we would add the HFP
21 sections, (Volume 3, chapter 3).

1 DR. JEFFREY: So there is a resolution and it has
2 been seconded. Let me make sure I have captured it.
3 The TGDC grants preliminary and conditional approval for
4 the HFP sections (Volume 3, chapter 3) subject to final
5 review of the edited and updated material.

6 Any discussion? Yes.

7 MR. GANNON: This is Patrick Gannon. If someone
8 could explain to me, this was one of the chapters that
9 in the matrix was marked as partial, except for cast
10 ballot recommendations, performance numbers, language
11 consistency on partial revision -- can somebody explain
12 how that's being handled, or taken of if we are given
13 this conditional approval?

14 FEMALE SPEAKER: I think the approval is
15 conditional on the finishing of those sections for our
16 final review.

17 DR. JEFFREY: Right.

18 FEMALE SPEAKER: I mean John is that the intent
19 of your language? I mean if we want to enumerate the
20 stuff that we have identified, I am leery of doing that
21 because I am sure there are little things that we have

1 forgotten and once we start to list things, it is a
2 problem but I would certainly be happy to list them now.

3 The thing we have listed, there is 3.2.2D technical
4 edit for language consistency to use the term partial
5 vision consistently throughout as we will be harmonizing
6 all definition and term usage. But I know that there is
7 a couple of other things that came up and I don't have
8 them written down but the big one is the benchmark
9 numbers.

10 FEMALE SPEAKER: I can list the others. There
11 was some rewording of the cast vote notification. And
12 there was some rewording of the VVPAT to be handed off
13 to CRT I guess.

14 FEMALE SPEAKER: That will come up in Chapter 6.

15 FEMALE SPEAKER: I think those are the major
16 issues. So that is just minor rewording except for the
17 performance benchmark completion.

18 FEMALE SPEAKER: How about TGDC grants
19 preliminary and conditional approval for NIST to
20 complete the HFP sections of the VVSG Volume 3, chapter
21 3, subject to final review of the edited and updated

1 materials? And I think you need sections after the
2 parenthesis is taken out.

3 MR. GALE: Mr. Chairman, John Gale. I think we
4 have talked about these friendly amendments before but I
5 would accept that as a friendly amendment to my motion
6 if my second will also agree.

7 DR. JEFFREY: If I could suggest a friendly
8 amendment to the friendly amendment, that it really --
9 well I was trying to get instead of NIST basically say
10 the sub committees so that -- because this is really a
11 product of the subcommittees. If that would be
12 accepted.

13 MR. GALE: Mr. Chair I will accept that as a
14 friendly amendment to the friendly amendment and my
15 second seems to concede likewise.

16 DR. JEFFREY: This is a very friendly place.

17 MR. GALE: And Mr. Chairman I assume that these
18 additional items that were discussed as incomplete will
19 be part of the redlining?

20 DR. JEFFREY: Yes. Any change to the document
21 that I will be looking at -- Mark Skall any change to
22 the document as of today will be redlined, is that

1 correct? So I think we are now in change mode so that
2 you will be able to see that. I may suggest is that
3 some point between now and June we rebaseline it once
4 people are comfortable because it may be a lot more red
5 than anything else. As sections move those will get
6 redlined as well.

7 Any other discussion on this resolution? Is there
8 any TGDC member on the phone? Alice?

9 MS. MILLER: Yes I am here, this is Alice.

10 DR. JEFFREY: Okay great. So let me reread this
11 resolution for you. This says the TGDC grants
12 preliminary and conditional approval for TGDC HFP
13 subcommittee to complete the HFP sections of the VVSG,
14 Volume 3, chapter 3, subject to final review of the
15 edited and updated materials. That resolution has been
16 seconded. Any other discussion? If not let me ask is
17 there any objection to unanimous consent? Hearing no
18 objection, Resolution 0307 passes by unanimous consent.
19 Congratulations HFP subcommittee.

20 FEMALE SPEAKER: Let me just thank everyone on
21 the TGDC for all of your great comments and I hope to

1 get some more comments to complete this but you have all
2 been very helpful.

3 DR. JEFFREY: I don't doubt for a minute that
4 there will be additional comments.

5 If I can ask Allan to probably cut and paste this
6 because we are going to have probably a very similar
7 resolution. May I ask which TGDC member wants to take
8 the lead on CRT.

9 MS. QUESENBERRY: I will do this, -- this is
10 Whitney, does that get me back up to a B+.

11 So I think that the section numbers, Allan that you
12 need are Volume 2, chapter 2, which is the definitions.
13 Volume 3, chapter 2 which is the conformance clause.
14 Volume 3, chapter 16 which is something, -- which is
15 general requirements. Volume 3, chapter 17, which is
16 requirements by voting activity. I believe all of
17 Volume 4, David Flater is that correct? All of Volume
18 4?

19 MR. FLATER: Yes.

20 MS. QUESENBERRY: And I don't know about Volume
21 5. Can we just stop at Volume 4 because that's really

1 all we have covered? Actually it is Volume 3, chapters,
2 2, 16 -- you can do just 2, 16, and Volume 4.

3 MALE SPEAKER: I would like to suggest Volume 5 as
4 well.

5 MS. QUESENBERRY: Okay Volume 5.

6 DR. JEFFREY: Okay for those on the phone let me
7 read this. There is a resolution that has not yet be
8 seconded that says TGDC grants preliminary and
9 conditional approval for TGDC CRT subcommittee to
10 complete --

11 MS. QUESENBERRY: In Volume 3, not chapter 3,
12 thanks David. It is 2, 16 and 17.

13 DR. JEFFREY: There is a resolution, let me start
14 from the beginning. TGDC grants preliminary and
15 conditional approval for TGDC, CRT subcommittee to
16 complete the CRT sections of the VVSG (Volume 2, chapter
17 2, Volume 3, chapter 2, 16, 17, all of Volume 4 and all
18 of Volume 5 subject to final review of the edited and
19 updated materials.

20 Is there a second?

21 MALE SPEAKER: If I may, I think we forgot Volume
22 3, chapter 18, which is the reference model.

1 MS. QUESENBERRY: Thank you. Yes.

2 MALE SPEAKER: I have a question on a motion, is
3 that appropriate to take at this time?

4 DR. JEFFREY: Sure.

5 MALE SPEAKER: Where does Volume 1, chapter 2 on
6 the definitions get picked up?

7 MS. QUESENBERRY: It is here.

8 MALE SPEAKER: Volume 1, chapter 2?

9 MS. QUESENBERRY: Is that Volume 1? I'm sorry it
10 is Volume 1, chapter 2. No it is Volume 2.

11 MALE SPEAKER: Volume 2, okay. I misread this,
12 thanks.

13 DR. JEFFREY: Okay there is a motion for a
14 resolution. Is there a second?

15 FEMALE SPEAKER: I second it.

16 DR. JEFFREY: Okay there is a resolution that is
17 seconded. Let me read it one more time again since it
18 changed just a bit and then open it for discussion.

19 TGDC grants preliminary and conditional approval
20 for TGDC CRT subcommittee to complete the CRT sections
21 of the VVSG, Volume 2, chapter 2, Volume 3, chapters 2,
22 16, 17, 18, Volume 4, all and Volume 5 all, subject to

1 final review of the edited and updated materials. That
2 is the resolution, it is seconded. Is there a
3 discussion?

4 MR. RIVEST: This is Ron Rivest. Volume 5, I
5 have not had a chance to dive into it at all and I was
6 wondering if somebody could comment a little bit more
7 about it, or has a chance to comment a little bit more
8 on what the current state of that is?

9 DR JEFFREY: David would you like to say a few
10 words?

11 MALE SPEAKER: Volume 5 is the testing standard
12 that for the most part specifies what the test labs must
13 do as part of the conformity assessment process. Both
14 Volume 4 and Volume 5 have material that is yet to be
15 integrated from the other subcommittees. For example,
16 in Volume 5 anything about open and vulnerability
17 testing that is going to be contributed from the STS
18 subcommittee needs to be integrated into that.

19 And one of the questions that came up is we were
20 discussing the resolution -- the audience was -- does
21 the wording in this resolution make it sound like CRT is

1 now responsible for providing that material? That is
2 the background and I will answer any questions.

3 MALE SPEAKER: I would think that the SDS would
4 expect to be (unintelligible) with CRT on that
5 particular piece as well.

6 MS. QUESENBERRY: Since we have drafted it, given
7 this case, there are a number of chapters -- the whole
8 Volume 4 also has material integrated from other
9 sections as well. So perhaps we add a sentence here
10 that says -- the CRT committee working with other
11 subcommittees as appropriate, rather than get into a
12 long enumeration of the sections.

13 DR. JEFFREY: Okay. There is a friendly amendment
14 that the phrase approval for TGDC, CRT subcommittee to
15 be that the TGDC CRT subcommittee working with the other
16 subcommittees to complete. Is that accepted?

17 MS. QUESENBERRY: Yes.

18 DR. JEFFREY: Okay so the friendly amendment has
19 been accepted and secondly accepted or whatever the
20 right phrase should be. Again, for Alice this is TGDC
21 grants preliminary and conditional approval for TGDC,
22 CRT subcommittee working with other subcommittees to

1 complete the CRT section of the VVSG, Volume 2, chapter
2 2, Volume 3, chapters 2, 16, 17, 18, Volume 4 all,
3 Volume 5 all, subject to final review of the edited and
4 updated materials.

5 Is there any discussion?

6 MALE SPEAKER: Whitney, were you intending for it
7 to read other subcommittees as appropriate, because
8 there are going to be some of them that it is not
9 appropriate for the subcommittees to necessarily be
10 involved?

11 MS. QUESENBERRY: (Off the microphone).

12 DR. JEFFREY: Yes, Patrick?

13 MR. GANNON: Patrick Gannon here. I have one
14 question about the inclusion of chapter 16 from this
15 granting of preliminary conditional approval. We had a
16 discussion yesterday on the changes to the
17 interoperability to intergratability. There were still
18 some questions raised at the end of that, that we didn't
19 get to complete. I think that is probably an area that
20 getting further public commentary will be helpful to
21 that. I am concerned about that being included in the
22 approval at this point.

1 DR. JEFFREY: Secretary Gale?

2 MR. GALE: I certainly agree with Patrick that
3 that needs another serious look by TGDC and ultimately
4 by public comment, but this is preliminary conditional
5 and whatever is accomplished between now and the final
6 teleconference will be redlined and we will have a
7 chance to see what may be -- would be a much more
8 improved version of intergratability.

9 I am not sure I could find that in my dictionary
10 even as a word, but certainly as a concept it will be
11 improved by the time we get to teleconference.

12 MS. QUESENBERRY: This is Whitney. I mean I
13 think for me the key point is that nothing we're doing
14 here cuts off discussion or work on any section. So if
15 there are sections we find as we read them where we have
16 issues, that those can still be raised. I think that to
17 me is the important thing, is that we are not closing
18 any doors here. We are simply allowing this to continue
19 -- the subcommittees to continue the work of drafting.
20 I think in particular, the work of harmonization and
21 technical editing which will make reading it a lot
22 easier.

1 DR. JEFFREY: Any other discussion on this
2 resolution?

3 Okay, there is a resolution on the table and it has
4 been seconded. I guess I will read it once last time
5 for the vote. TGDC grants preliminary and conditional
6 approval for TGDC CRT subcommittee, working with other
7 subcommittees, to complete the CRT sections of the VVSG,
8 Volume 2, chapter 2, Volume 3, chapters 2, 16, 17, 18,
9 Volume 4 all and Volume 5 all, subject to final review
10 of the edited and updated materials.

11 Is there any objection to unanimous consent?

12 Okay, hearing none, Resolution 0407 passes so
13 congratulations to the CRT group.

14 David you look very excited.

15 MALE SPEAKER: And I too would like to thank the
16 committee for all the great input and review that has
17 occurred on the teleconferences and in email and I look
18 forward to working with you to finish these guidelines.

19 DR. JEFFREY: Thank you David. With that I would
20 like to ask John are you ready? John Wack to come up
21 for some remaining issues that they would like some
22 guidance on.

1 MR. WACK: I am as ready as I will ever be
2 which is not real ready, but ready enough.

3 We have to use two different types of PC here,
4 intergratability.

5 MALE SPEAKER: Not really.

6 MR. WACK: Hang on just a second here. Now let
7 me see if I can unsqueeze that. What I am going to do
8 is just go over some issues that we have quickly
9 identified as things we need guidance from today. That
10 looks good enough. Oh that doesn't look good enough.

11 DR. JEFFREY: For Alice we are just having a few
12 technical difficulties on our display here so hopefully
13 it will be just a minute.

14 MR. WILLIAMS: John if you would hum or sing while
15 you are doing that at least I would know the phone
16 hasn't gone dead.

17 DR. JEFFREY: Britt are you on?

18 MR. WACK: Yeah originally it was na-na-na-na,
19 hey, hey, goodbye.

20 DR. JEFFREY: While you are doing that we could
21 have a tutorial on cryptography. I know at our last
22 meeting a lot of people enjoyed that.

1 Too bad we are up and ready.

2 MR. WACK: Okay this list was put together a
3 bit quickly and I will apologize in advance if there are
4 some things up there that really, you know, are not open
5 items and I didn't understand things correctly or if I
6 have left some things out. I have two slides and
7 undoubtedly there is other material.

8 I also don't mean to put people on the spot but
9 some of these I think it would be better if some of the
10 authors of the material also came up and you know,
11 answered any questions or discussed any ramifications.
12 And I may need to do that right here with CRT.

13 And the biggest issues with changes to the
14 glossary, we have heard that people want various
15 changes. I heard this morning that there was some
16 additions to the glossary which I think are pretty easy
17 to handle. I was talking to John Gale and he mentioned
18 a number of terms right off the top of his head and I
19 think that is pretty easy to do.

20 Changes to existing definitions, in some cases not
21 much problem, but in other cases the ramifications could
22 extend throughout the whole document. Perhaps we need a

1 little bit of discussion there and Dave Flater would be
2 the best person to get up here and handle some of the
3 issues there.

4 Let me ask you what would be best? Do you want me
5 to quickly go through items and then we start working
6 them or do you want to handle them one by one.

7 DR. JEFFREY: Go through them all.

8 MR. WACK: The other item, uncertainty about
9 human readable text, also being the text that is
10 supposed to be machine-readable. I think there was some
11 discussion yesterday about a barcode in addition and I
12 think we were clear on that. But it was the issue of
13 whether we are requiring the human readable portion also
14 to be machine-readable and there is an uncertainty as to
15 what the issue was with EBMs.

16 I am thinking that we are probably clear on the
17 requirements and support multi page cut sheet VVPAT
18 summaries but I am not positive. The issue there was
19 where they should break, whether problems with handling
20 multi sheet summaries are such that we should really
21 strive to just require one page per summary. There are
22 some issues there.

1 We talked about some selective material on software
2 disk that possibly should move out of Volume 5, we
3 weren't sure because some of that is procedural and test
4 oriented. And then we need the sense of the TGDC on some
5 of the new material out there, whether we are going down
6 the right direction or not.

7 There were other issues that we discussed, one of
8 them being e-poll books and there are probably a couple
9 of other items that I think we were told basically to go
10 back and work some more on that. And I have the sense
11 that we know what we need to go work on. But if there
12 are other items that should be added to this list please
13 feel free to do so. Do you want to list those items if
14 you have additional items and I can put them up on the
15 slide but then we can go back and start at the beginning
16 of the list? Shall we do that?

17 MR. RIVEST: This is Ron Rivest. So John there
18 was a couple of other things that STS was explicitly
19 chartered to think about yesterday. There was an issue
20 in Section 6.4 about batching of (unintelligible).

21 MR. WACK: Okay we had the impression that,
22 that should be a should requirement and not a shall.

1 That it is something that may be difficult to support
2 but that the idea was good and it should be a should.

3 MR. RIVEST: Then there is not much else to do
4 there but that was something that we were targeting. In
5 other words, the section of locks 14-6 I think was the
6 number. The lock is important for security then you use
7 the UL437, if not important then the lab can attack it -
8 -

9 FEMALE SPEAKER: 14-2.

10 MR. RIVEST: 14-2, 14-6.

11 FEMALE SPEAKER: There is no 14-6.

12 MR. RIVEST: I am just going through my notes
13 from yesterday and there was a couple of items that we
14 took issue with.

15 MR. WACK: Okay let's leave that up there but
16 also we want these to be items that we need your input
17 on today before we can go back and finish the
18 requirements.

19 Are there additional things that were definitely
20 left open that we need resolution on?

21 MR. GANNON: This is Patrick Gannon. John,
22 yesterday you left it that we would be receiving some

1 slides in the discussion today on the chapter 5 for
2 electronic records, is that something that we add into
3 this or is there going to be a whole another session
4 this morning to go through the electronic record
5 section.

6 MR. WACK: We did develop a summary slide on
7 electronic records that we could do and we could add
8 that to the list.

9 MR. GALE: Dr. Jeffrey, this is John Gale.
10 These aren't probably things that you need guidance on
11 maybe particularly at this point John, but they are
12 things that would certainly help further my
13 understanding of some of these issues. I know we have
14 discussed them off and on but the status of barcode
15 continues to be of concern to me. I know there has been
16 pushing and shoving on that issue. I just need to
17 understand what direction we are going and then maybe at
18 that point we would know whether or not there needs to
19 be any further guidance on that issue.

20 And then the e-poll book, yesterday we -- certainly
21 that was left up in the air and I don't know if that
22 again you need further discussion or guidance from us on

1 that or whether we had given you enough information for
2 you to proceed on that issue.

3 And there was one other issue I was thinking about
4 as well but it doesn't come to mind. But those are more
5 things that I am concerned about as a member of TGDC, I
6 guess that I need clarity on maybe more than this needs
7 clarity on.

8 FEMALE SPEAKER: I think we had some questions
9 in the chapter on auditing, which is chapter 4, just
10 about the structure of how the chapter was structured.
11 And it seemed to us -- and this relates to electronic
12 records, if there were electronic record requirements in
13 that chapter, as well as in chapter 5, this might be a
14 place for consolidation and harmonization so that we
15 don't have to go looking throughout the entire manual to
16 find them. I know this is just an artifact of how it
17 was written but this seem like a good time to wrap that
18 up.

19 MR. WACK: Okay.

20 MALE SPEAKER: The coffee is starting to work on
21 me. My mind is getting clearer. Thermal paper and roll
22 -- I keep saying rolls and I mean paper rolls, again I

1 guess it would be helpful for me to know kind of where
2 we are on those issues as well.

3 MR. WACK: Okay. Is that good enough? Any
4 other items, going once, going twice, sold.

5 Okay perhaps maybe then the best place to start
6 would be with CRT because we only have one issue there
7 although it is a very important issue. And Dave Falter
8 if you don't mind me putting you on the spot, if you
9 would like to talk about this, that would be great.

10 MR. FLATER: Thank you John. So as John said, we
11 have heard comments to the effect that folks want to
12 possibly change some of the definitions that are in the
13 glossary. And I am here primarily to sound as note of
14 caution about how this is to be conducted.

15 I want to read a paragraph that appears in the
16 scope and applicability section of the terminology
17 standard.

18 "Terminology for standardization purposes must be
19 sufficiently precise and formal to avoid ambiguity in
20 the interpretation and testing of the standard. Terms
21 must be defined to mean exactly what is intended in the
22 requirements of the standard, no more and no less.

1 Consequently this terminology may differ from plain
2 English and be unsuitable for applications that are
3 beyond the scope of the guidelines. Readers are
4 especially cautioned to avoid comparisons between this
5 terminology and the terminology used in election law."

6 So now to repeat this in different words, the
7 purpose of the terminology standard is to provide well
8 formed terminology as a foundation for the WVSG.

9 So consequence number one, is that the terminology
10 standard is not an end of itself. We are not trying to
11 define terminology -- a standard terminology for every -
12 - for example for all 50 states to use. We already know
13 that all 50 states have their own election law and they
14 have terms defined in their own election law. And in
15 all likelihood there are inconsistencies among them so
16 we cannot bite off that large of a chunk and try to do
17 that here. We need to focus on what is required for
18 this standard.

19 Second consequence is that we have to be very
20 careful when modifying the terms that appear in the
21 terminology standard. When the norm of text of a
22 definition is changed, it changes the meaning of every

1 single requirement in the products standard that uses
2 that term. So the consequences can be drastic from
3 changing a single word in a definition. So as the
4 committee discusses the changes that need to be made to
5 the terminology standard, we need to pay attention to
6 these consequences and have a full discussion and
7 consideration of what those consequences are and whether
8 they are all in fact intended by the change that is made
9 to the terminology standard.

10 MR. RIVEST: This is Ron Rivest. Thanks David.
11 I appreciate your note of caution, I think that is well
12 advised. My concern is more with missing items and if
13 you can give us any advice on that. There are terms
14 that are used, quite a few terms I think that are used
15 in the standard that are not defined. For example,
16 voting machine is a used term but we don't have voting
17 machine in the glossary. Vote as a noun is not there.
18 Machine readable is not defined, et cetera. So we have
19 a number of terms that are used and I am not sure
20 whether we should make a more assiduous effort to try to
21 be comprehensive about hitting all those terms.

1 MR. FLATER: Certainly we need to examine each
2 case. For voting machine I think the definition that is
3 intended is voting device. We do have that in the
4 glossary.

5 MR. RIVEST: So we would want to replace the use
6 of voting machine to voting device in the standard
7 probably.

8 MR. FLATER: Probably.

9 MR. RIVEST: Yeah.

10 MR. FLATER: In other cases I would imagine the
11 terms have been used with their regular dictionary
12 meaning. In that case a definition may not be needed in
13 the terminology standard. But we do need to examine
14 each case individually and carefully.

15 MS. QUESENBERRY: This is Whitney. I have a
16 question. At the beginning of Volume 3 -- I guess it is
17 Volume 3, chapter 2, norm of language, 2.6 there is a
18 list of voting device terminology. I have done a quick
19 check and it looks like all of these are in the glossary
20 or in the definitions but are these intended to be the
21 same definitions that is in the definition section, just
22 repeated here for convenience?

1 MR. FLATER: Yes, in fact they were not repeated
2 back in our earliest drafts and we received input to the
3 effect that -- for you know, for convenience the
4 definition should be repeated in the conformist clause.
5 It makes no difference to me as long as they are
6 identical.

7 MS. QUESENBERRY: That would be my point. I mean
8 I don't want to beta this horse because I think we all
9 agree that we want to use terminology consistent so we
10 say what we mean and mean what we say. And if there are
11 definitions that are hidden in some of sections they
12 should be surfaced very carefully.

13 DR. JEFFREY: Paul?

14 MR. MILLER: And I also appreciate the caution so
15 perhaps what I would like to do is provide a specific
16 example of a definition that appears to me that needs to
17 be changed and we can discuss what the ramifications of
18 that are. The general election is defined as a election
19 in which there is no partisan contest. In terms of the
20 language that election officials use, that is clearly
21 incorrect because there are a number of partisan contest
22 in a general election. The presidential race is a

1 partisan contest. Governors, state senators, and all
2 down the line are all partisan contests.

3 If you mean that a voter does not have to identify
4 what party they are affiliated with in a general
5 election that is true, but clearly there are partisan
6 contests in a general election.

7 MR. FLATER: In this case it sounds to me as if
8 the point of confusion is with the definition of
9 partisan contest. Partisan contest is defined as one
10 for which the eligibility to vote in that contest
11 depends on one's registration, in terms of affiliation
12 to a political party.

13 MR. WILLIAMS: Well that is not completely accurate
14 either because there are a lot of states that have open
15 registration where you don't have to declare a party
16 until you actually get to the polling place.

17 MR. FLATER: In that case still though whether
18 the party -- I need to get the exact wording.

19 MR. WILLIAMS: Well you said registered as a party.

20 MS. QUESENBERRY: The wording is contests such
21 that eligibility to vote in that contest is restricted
22 based on political party affiliation or lack thereof.

1 Note the affiliation might be the registered affiliation
2 of the voter or it might be an affiliation declared at
3 the time of voting.

4 MR. FLATER: So there you go.

5 MR. WILLIAMS: Okay.

6 MS. QUESENBERRY: But I think the point Paul is
7 trying to make is that yes the standard needs to be
8 internally consistent but it is being read by people who
9 also use these words and when it deviates from the
10 general usage it might be better to call it a FUBAR
11 election then to call it a non partisan election.

12 MR. FLATER: I agree completely. If there is a
13 term that you know, as engineers would say has been
14 ruined by --

15 MALE SPEAKER: You mean that in the nicest possible
16 way.

17 MR. FLATER: Yes I mean that in the nicest
18 possible way, if there is a term that has been used so
19 much practice to mean something other than what we need
20 it to mean, in the specification, then in fact the
21 correct course of action is to globally replace that
22 term with another term that has been not "ruined".

1 MS. QUESENBERRY: So perhaps an action that the
2 committee might take is for -- especially for those who
3 live with this material daily is to read it again, not
4 from the perspective of do we agree with what the
5 requirements are but to read very carefully. I think
6 this probably applies to several of the chapters where a
7 reading by members of the committee -- you know does
8 this make sense in reality, will I think not only help
9 the standard improve but will help other people who will
10 have to read this standard after us. You know let's
11 short circuit some of the comments if we can do them
12 ourselves but let's not have things gather a lot of
13 comments because of a misunderstanding or vocabulary.

14 MALE SPEAKER: What I am hearing as a suggested
15 approach is to move forward is finding some other terms
16 to use where the terms are in general usage and have a
17 different meaning in the way that they are used.

18 MR. FLATER: This issue within the scope of the
19 standard, in terms of normative text it doesn't matter
20 which term we use. So it is a convenience, it is a
21 concession to readability and understandability if you
22 will that we globally replace terms that are easily

1 misunderstood. It is better in fact if we have a formal
2 definition to mean what we say and say what we mean and
3 avoid unfortunate connotations that we did not mean.

4 It is better to avoid terms that already have
5 connotations that are not what we meant.

6 DR. JEFFREY: What I would like to do is follow-up
7 on Whitney's suggestion and actually task the TGDC, this
8 is not a formal resolution, task the TGDC to in
9 particular review the definitions to try to identify
10 those definitions that they believe are, to use David's
11 phrase, damaged in the sense that they would be
12 confusing to the broader audience and to try within one
13 week contact David with those definitions that you
14 believe to be damaged or ruined. So there is a higher
15 threshold ruined on that. And then David on a case by
16 case basis you can then deal with those. In addition
17 there was a task to make sure that we captured all of
18 those definitions necessary to then apply to the
19 standards in an unambiguous way and again with the
20 caveat that you mentioned, those that are using the
21 common English accepted definitions don't necessarily
22 need to -- we don't need a whole Webster volume here but

1 we have to make sure that we have captured all the ones
2 that we are using in the standards.

3 So I think all of the TGDC members have just been
4 tasked. John?

5 MR. WACK: Okay this is always a good one, the
6 status on bar codes. I will give you the status I
7 believe where we are at. I believe that that is we have
8 requirements in the VBPR section that currently permit
9 the use of barcodes. There are caveats on those
10 requirements, actually maybe I can just find them
11 quickly.

12 **(END OF AUDIOTAPE 5, SIDE A)**

13 * * * * *

14 **(START OF AUDIOTAPE 5, SIDE B)**

15 **(RECORDING DID NOT START AT THE BEGINNING OF THE**
16 **AUDIOTAPE)**

17 MALE SPEAKER: -- Valid, I think is a concept that
18 I think means that there is going to be this enormous
19 divide between equipment that is used for verifiable
20 paper trail and equipment that is used for durable
21 ballot. But I just want to preserve the option as much
22 as possible for vendors to continue to use equipment for

1 verifiable paper trail that can be on a paper roll of
2 obviously sufficient quality of paper that it meets all
3 the test of audit time and court contest time and
4 because of the handling that comes with that.

5 So I guess what you are saying to me is we have
6 preserved that option.

7 MR. WACK: Yeah, the general approach we took
8 was that VVPAT systems currently do use paper rolls.
9 They may continue to do so in the future. You are
10 right, there are dilemmas they present. It is nice that
11 the records are all in one package but at the same time
12 there are some privacy concerns about records. But we
13 have requirements in there to make them more usable in
14 audits and not to denigrate their usage or anything of
15 that sort.

16 The last issue I have up is we did promise some
17 summary slide on the electronic records material that we
18 included. And I think that is on the other computer and
19 I have asked Bill Burr if he would like to come up and
20 present that material.

21 DR. JEFFREY: And for those of you on the phone,
22 John will continue hum while we switch computers here.

1 MR. WACK: There is just one thing I wanted to
2 share, I always thought this was a funny quote. I was a
3 history major but talking about dilemmas with paper
4 rolls, there is some American patriot who was talking
5 about somebody else he didn't like and he said he is
6 like a rotting fish by moonlight. He shines and stinks
7 at the same time. And paper rolls have lots of pros and
8 cons but we have stuck that they are used on voting
9 systems, they may continue to be used on voting systems
10 and we just want to make sure that a lot of the
11 idiosyncrasies are taken care of and they are fully
12 usable.

13 DR. JEFFREY: John I assume you mean then that we
14 want to continue to shine not stink.

15 MR. BURR: Okay, the electronic record section,
16 the use of it was actually largely discussed at the
17 March meeting in the presentation that John Kelsey gave.
18 Basically if you look at the electronic records section
19 much of it is the analog of what we are talking about
20 with paper records. And much of the information is the
21 same.

1 The biggest difference actually is that with paper
2 we have got a lot of issues about spools, and if the
3 printer jams, and mechanical things that go with paper
4 and printing and in the electronic records we have got
5 the stuff about digital signatures and the certificates
6 that are put on to either the records to establish what
7 the keys are and secure the records.

8 So the detail in the electronic records section has
9 more to do with the fact that the records are digitally
10 signed and establishing the integrity and traceability
11 through the signature process and those things
12 themselves are established by electronic records that
13 are included in the section.

14 The same general formula that we have in the paper
15 that it has to be an open format and defined and it has
16 to be printable so that you can take the electronic
17 records, print them out, and a human being can compare
18 what is printed on the one printed record that we have
19 already printed, are essentially similar as well. And
20 the ultimate requirement is that this will produce
21 tallies that support auditing. So it is pretty
22 analogous and pretty similar actually to the paper

1 records except that the issue of you know all the paper
2 handlings stuff and the securing the paper and so on is
3 not there but the additional complexity of the digital
4 signatures is.

5 I don't know is a quick summary what more to say.
6 Whitney?

7 MS. QUESENBERRY: This is Whitney, and if I could
8 jump in. This chapter I presume is written largely with
9 the perspective of security of those records, being
10 written by the security -- STS.

11 MR. BURR: Right.

12 MS. QUESENBERRY: But it seems to me that they
13 also have I guess what I would call a corerequirements
14 function which is supporting the work of the election
15 officials. And before Patrick jumps in with what I am
16 sure a lot of things that he has to say, I would just
17 add two comments that occurred to me last night from
18 rereading the material. One, is that it would be nice if
19 all of the requirements for the records were gathered in
20 one place so we don't have audit requirements in the
21 audit chapter and we do that by pulling them together so
22 you could see pretty easily what that record had to

1 hold. And the other is this might be a place where some
2 work with, I would say CRT but I think more specifically
3 those on this committee who have to actually use this
4 information in the field to make sure that we have a
5 record that is not only secured but useful.

6 MR. RIVEST: Ron Rivest. Also in a couple of
7 discussions, some of the terminology like the final
8 election tally report, I think may not be consistent
9 with the way these reports are used in the field too, so
10 I think some feedback from the TGDC members who are
11 actually election officials may be helpful in sort of
12 harmonizing at least the terminology with the usage in
13 the field. For some of the reports I think they may be
14 labeled differently and perhaps even the content of
15 those reports needs to be reviewed too.

16 MR. BURR: I think we have a general
17 terminology issue between several of the sections
18 themselves as well, that things are called slightly
19 different things in different places.

20 MS. QUESENBERRY: I hasten to add that my
21 comments were not intended as a criticism. I have no
22 idea if they are useful in the field or not but it would

1 be nice since we have actually assembled a committee
2 that includes election officials that we double check
3 that before we inflict this on the world.

4 MR. GANNON: This is Patrick Gannon. Yeah I
5 would agree specifically within the chapter 5, there are
6 references to this chapter from the chapter 4 dealing
7 with the auditing that makes reference to terms that
8 don't exactly match so that specifically needs to be
9 looked at, when you look at pages --

10 MR. BURR: Between auditing and electronic
11 records and paper records and the cryptography section,
12 we need a good thorough scrub of the terms to make sure
13 that -- I think the concepts are all pretty consistent
14 but we haven't been as consistent as we ought to have
15 been with the terminology. So you find something called
16 one thing once place and almost the same but not quite
17 the same thing somewhere else.

18 MR. GANNON: Exactly. And also from an election
19 official calling something a final election tally report
20 when the election haven't been declared as final was
21 brought up as an issue that needs to be looked at there
22 as well as simply the consistency of the phrase or words

1 that are used for describing the different specific
2 requirements. So for each of the electronic record
3 requirements, those terms aren't always matching the
4 references made to them from other chapters specifically
5 those we looked at in chapter 4.

6 MR. BURR: So let me ask Whitney now, are you
7 suggesting that what we really ought to have is -- I
8 don't know a section on records, that defines the
9 information that goes in the cast ballot record, or
10 something like that? And then maybe separate sections
11 about paper handling or something?

12 MS. QUESENBERRY: I would hesitate to make such a
13 broad and sweeping statement at this point in the
14 process because I have no idea what the implications of
15 that statement might be. Although it sounds like a
16 great thing to say it might have been something we might
17 want to have said a year ago. In the immediate I did
18 note that it was pretty obvious when you went from
19 chapter 4 to chapter 5, that chapter 4 ends with some
20 requirements for electronic records to support audits
21 and then we go immediately into electronic records.
22 That pulling that stuff together -- I see some people

1 who I might not get out of the parking lot if I say
2 more.

3 MR. GANNON: Patrick Gannon. I have another
4 question just on the introductory section of this
5 chapter and it follows on what Whitney was saying that
6 it appears from that introductory sentence that says in
7 order to support auditing et cetera that this chapter
8 was written specifically to support that.

9 However, going back to previous discussions and
10 TGDC resolutions on common ballot formats and on
11 interoperability it would seem to me that an added
12 paragraph right under that, that goes along the lines
13 of, in order to support interoperability between
14 different components in a voting system or whatever the
15 exact terms are, the system must be able to produce
16 electronic records in a common format.

17 So the question that I think that needs to be asked
18 here and discussed is what is the intent of the use of
19 electronic records as they are described in here and
20 then the specific sets of requirements. Are these
21 requirements specifically to support auditing or should
22 we expand this chapter to include requirements for

1 electronic records that would support interoperability
2 or at least intergratability going back to the Volume 3,
3 chapter 16 on intergratability.

4 MR. BURR: Okay fair enough. At this point
5 this is all in the security section. It was done to
6 facilitate an audit as we said in the first place and at
7 the beginning of the section. The -- most of my career
8 here at NIST which is only 30 years, I have been working
9 on interoperability standards. This is I think the
10 first standard I ever worked on that was not, I thought,
11 an interoperability standard. It has taken me a little
12 getting used to it actually. Although indeed from my
13 point of view it was, well oh good at least that is one
14 simplification. There is a whole bunch of issues that I
15 don't have to worry about. If interoperability along
16 the lines of this component should be interoperable and
17 that component, and we are going to specify it as our
18 goal then we have opened up a huge box that I thought
19 was closed.

20 MS. QUESENBERRY: I think you are a deep expert
21 in that area and we are using the words in a rather more
22 Webster's dictionary meaning. I don't think we are

1 talking about developing interoperability standard but I
2 think what I heard Patrick say is that when the language
3 -- when the record is complete and available in a public
4 format then it makes it possible for -- what did we call
5 it intergratability -- it makes is possible for
6 information to be passed from one system to another in a
7 knowable way.

8 That is very different in my mind, in my layman's
9 mind from interoperability. It may be a first step
10 towards it but it certainly isn't creating an
11 interoperability standard.

12 MR. BURR: Well okay but how -- what is the
13 goal that the TGDVC or the EAC desires of us with
14 respect to this? It seemed to us I think in the
15 security committee that the essential security that we
16 had to achieve was that you had to be able to read these
17 records and understand them.

18 MS. QUESENBERRY: I think all we're saying is
19 that this is -- let's take as a given that this is great
20 security work but there is nothing isolated about
21 anything you do in voting. It all sort of -- everything
22 touches everything else. And here is a place where

1 maybe some input from the other committees would be
2 helpful in clarifying this section.

3 DR. JEFFREY: Paul.

4 MR. MILLER: To follow-up on what Whitney said, I
5 think Patrick's comment earlier, there are some things
6 in here that I think from an election's official
7 perspective that we would have concerns about and would
8 want an opportunity to weight in and discuss. I am not
9 aware that that discussion has happened at this point.

10 MR. BURR: Can you explain what things?

11 MR. MILLER: One example would be the -- what is
12 referred to as the final election tally report, having
13 information on there that we would not expect to be
14 releasing to the public or -- it certainly makes sense
15 as part of an audit report but it doesn't make sense as
16 a tally report that we release to the public. Those
17 kinds of things and I assume tabulation center,
18 definition of terms, probably is the same as central
19 count or election management systems that have been used
20 in other places. But I believe that is the first place
21 where that term is used. Just some things like that.

1 MR. BURR: Okay. I mean I don't think we need
2 to speak at all to what gets released to the public
3 normally.

4 MR. MILLER: And that may be in which case we
5 would definitely need to work with some of the language
6 here because I don't see a way of reading 5-10
7 differently than that.

8 MR. BURR: I think maybe --

9 MS. QUESENBERRY: 5-10 says the following
10 requirements apply to the final election tally produced
11 by the tabulation center computers and released to the
12 public. So it may be that it is simply harmonization of
13 language and clarification but we can't -- but I think
14 maybe one of the things we ought to say is we need -- I
15 guess we are saying the opportunity to read it more
16 carefully for the issues that Patrick is concerned
17 about, the issues that Paul is raising and it may be
18 that these are all very simple editorial points and
19 there may be that there is something deeper lurking
20 under there.

21 MS. PURCELL: This is Helen Purcell. Again with
22 that final tally, they are never really final until some

1 other body canvases that vote, so these are not final
2 tallies, they are unofficial, preliminary and a lot of
3 other words that are used but they are certainly not
4 final.

5 MR. WAGNER: This is David Wagner. I want to
6 just second the comments that Paul and Helen made. I
7 think they caught a couple of good -- you know may have
8 caught some real issues in here that shouldn't be
9 downplayed. So this is a good lesson that having some
10 more review from election officials on the committee
11 would be very helpful.

12 MR. BURR: I think some of those terminologies
13 would apply as much to the paper record as to the
14 electronic I think.

15 MS. QUESENBERRY: It might well be that we will
16 learn lessons here that can be applied in other sections
17 but lets start with this section.

18 DR. JEFFREY: This is Bill. Patrick, do you want
19 to get into a little bit more deeper discussion on the
20 intergratability with the electronic data records at
21 this point or are you satisfied with the discussed right
22 now and want to take it back to subcommittee?

1 MR. GANNON: Well I think Bill asked the valid
2 question in terms of what is the sense of the TGDC with
3 respect to electronic records and I was pointing out in
4 the introductory section of the electronic records, what
5 should be the scope? Are they specifically -- are these
6 requirements only for auditing capabilities or are these
7 requirements to support a broader use? If so then we
8 should all --

9 **(END OF AUDIOTAPE 5, SIDE B)**

10 * * * * *

11 **(START OF AUDIOTAPE 6, SIDE A)**

12 MR. GANNON: -- That is used to do the evaluation
13 that was requested under that resolution. You know,
14 again before when this was reported on in March, the
15 statement was well, we can't -- NIST has not been able
16 to fully "evaluate" any common ballot format
17 specifications in the market because there was not a set
18 of requirements. So it is chapter 5 here, the set of
19 requirements against which common ballot format
20 specifications are to be evaluated.

21 I think we need to be clear on what is the purpose
22 and scope of this chapter 5.

1 DR. JEFFREY: Any other TGDC members want to take
2 that on and provide -- start the discussion to provide
3 guidance?

4 MS. QUESENBERRY: Well I guess I would like to
5 hear what Patrick would like see?

6 MR. GANNON: Well as I said earlier I do believe
7 that the introductory section of this chapter should be
8 expanded to include a statement on usage of electronic
9 records to support interoperability between however we
10 defined election systems or system components whatever
11 the appropriate definition of that is. And that may be
12 qualified in terms of not specifying interoperability
13 testing but to support that feature so that it falls in
14 line with the definition under the intergratability
15 where we talk about intergratability requirement may be
16 met by providing the capability to export data in a,
17 whatever the terms are, royalty free published open
18 format. So this section would be in harmony with the
19 intergratability sections.

20 So I would at least request that this be harmonized
21 with that. And then determine how this is expanded or

1 whether this is meant to then follow-up on TGDC
2 Resolution 2305.

3 MR. SKALL: This is Mark Skall. Can I just
4 clarify one point which I am hope I am not confusing.
5 So all we're doing in the testing section, all we can
6 ever test for, is conformance to the standards. We
7 can't test for interoperability. Everyone is
8 comfortable with that, correct?

9 So the only real issue here is if in fact
10 interoperability or intergratability or some INT word is
11 the goal, and I am not sure of the distinction between
12 those words, would we define the requirements
13 differently because that is a goal? And if the answer
14 to that is yes, so the question for Bill is, are there
15 requirements in his section that you see that should be
16 worded differently because of this INT goal? Do you
17 specific ones that would change?

18 MR. BURR: Let me go back to the statement that
19 you made when you said that we can't test for
20 interoperability and I would contend that we could test
21 for interoperability if we chose to do so, chose to make
22 those requirements.

1 MR. SKALL: What I meant was the scope of the
2 standard is to define requirements and then we could
3 test to see if in fact those requirements are adhere to
4 by a voting system. So in that sense we are defining
5 conformance to the standard. Interoperability is this
6 next level.

7 One could certainly test for it but it is not the
8 scope of this particular standard with respect to the
9 requirements. When you write a standard you can only
10 write the standard to determine requirements and then
11 test to see if implementation meets those requirements
12 within the scope of the standard. There is another
13 level one could have, one could have many things to
14 determine interoperability but that is the next level up
15 and it is a different scope for this particular
16 standard, is all I am saying.

17 MALE SPEAKER: If it is chosen to limit it at that
18 point, whereas the scope of the VBSG 2007 is to address
19 the needs for future, next generation of election
20 systems. So limiting it to next generation election
21 systems that are not tested interoperability then that

1 is the chosen restriction on the current set of VBSG
2 standards.

3 Given that, that it is a choice to not specify
4 interoperability in this VBSG, then yes we need to
5 figure out what is the lower level requirement of
6 intergratability and in the electronic records put
7 appropriate sentences in that section that states that
8 this set of electronic record requirements include
9 definitions that would enable some of the
10 intergratability capabilities.

11 MR. SKALL: Could you define in your mind the
12 difference between intergratability and
13 interoperability?

14 MALE SPEAKER: No, because we argued this back in
15 the "intergratability section" and I had to back off --

16 MR. SKALL: So again --

17 MALE SPEAKER: -- We deleted the word
18 interoperability out of that.

19 MR. SKALL: So again I will ask you if anyone
20 has specific changes to the requirements -- I guess we
21 first have to decide if this is a goal of this chapter,
22 if it is then the next issue is are there specific

1 changes to the requirements as you have seen them that
2 would suggest because of this goal.

3 MALE SPEAKER: The answer I think is dependent upon
4 feedback from experts in the marketplace and since this
5 is the first public review -- it is now available for
6 public review, and there was an action item stated at
7 out last meeting that NIST would be sending out the
8 requirements to the IEEE P1622 and the Oasis Election
9 Voter Services Technical Committee for review.

10 So I think there needs to be that review that
11 occurs from those experts that deal with common ballot
12 specifications, electronic record specifications to give
13 us feedback on this particular section before we can say
14 that yes, this set of requirements is in fact fairly
15 complete.

16 So part of the next of my question would be what is
17 the plan to in fact do that and be sure we get those
18 feedback into this in a timely manner?

19 MALE SPEAKER: Basically with regard to what goes
20 into the VBSG itself I guess we are figuring that part
21 out but we do plan to add some informative text that
22 essentially says that the expert format should be in

1 some format along the lines of what we have been talking
2 about, an interoperable format and you know we would
3 point to IEEE and Oasis as areas where that is under
4 development.

5 As oppose to post VBSG or at some point working
6 more with the IEEE and Oasis, we are on tap to make sure
7 that they have all the materials they need in order to
8 judge whether their formats are going to be able to
9 fully support what is in the VBSG. We have chosen to
10 wait with that until we settle, you know, the issues we
11 have right now with electronic records and so on and so
12 forth. But I would expect those groups will hear more
13 from us post July.

14 I think the most we can do at this point is make
15 sure they understand what we have in the VBSG at this
16 point and you know do some more dialogue down the road.
17 But what we are focusing on mainly -- I would prefer to
18 deal with that post this meeting and focus more on what
19 we should actually be putting in the VBSG right now.
20 And as I understand it right now we do need to put in
21 some informative text along the lines of pointing to
22 these subcommittees.

1 MR. BURR: Let me ask kind of a technical
2 question here about this. One of the requirements we
3 have in the electronic records section is that things be
4 printable. It may not be really obvious what that
5 means.

6 What I would wonder from the point of view of the
7 perceptions of people here, I think if you take
8 something in XML typically you can print it out and sort
9 of parch the characters. But people who are not XML
10 gurus are going to find this sort of raw thing printed
11 out is pretty indigestible at best.

12 On the other hand, XML and I presume EML can build
13 rules for how to then print this out so it is nicely
14 formatted and people can read it. Would it cause
15 problems in an audit to call that the printable output,
16 -- now you are talking about quite a lot of processing
17 so it is sort of like what you see on the screen when
18 you look at a web page, looks very different then if you
19 look at the HTML that is behind it.

20 So I think there is a philosophical issue here
21 about whether or not these kind of records, -- if we say
22 that they are supposed to be printable what that means.

1 MR. GANNON: Patrick Gannon. Well I don't see
2 much difference whether you are talking about a record
3 that is formatted in XML or a record that is formatted
4 in some database. We state under the intergratability
5 that it could be a record that is in a database and the
6 schema for that database must be public accessible so
7 somebody could write an interface routine to go in and
8 extract that data.

9 So you are asking the same question, which is does
10 that mean doing a database dump in some binary language
11 as a way for someone to read the database or is it
12 simply having a routine that prints the specific data
13 itself without all the indexes and so forth around it
14 would be the same as having somebody create a print
15 program that would simply print the data records based
16 upon a style sheet or something from XML.

17 So I think to meet the printing requirements there
18 is probably an expectation that the process of printing
19 is going to use whatever formatting is necessary and
20 only, you know, print out the labeled associated data
21 without all the angle brackets and without all the

1 database indexes in there that would make it difficult
2 to read. So I don't think there is a problem there.

3 The requirements for printing really don't say that
4 you want to do a print of source, sensitive source data.
5 The expectation is that the ability to print these
6 records simply means that you have a way to use some
7 sort of formatting capability and you print. Somebody
8 should go back and audit to see that what is being
9 printed is in fact all of the data in that record,
10 nothing is being left off. It is not being translated or
11 converted or changed between the raw source and what is
12 being viewed in the print.

13 So I don't see a particular problem with being able
14 to meet the requirement of printing the electronic
15 records. Again whether those electronic records are in
16 the database or whether they are in some barcode
17 language.

18 DR. JEFFREY: I am just trying to abstract this
19 out a little bit to a higher level and I think
20 philosophically you know trying to harmonize chapter 16
21 on intergratability and chapter 5 on electronic record,
22 I think that philosophically we are fairly clear on

1 chapter 16, the intent of trying to maximize
2 intergratability of all of the systems and in chapter 5
3 specifically talk about the records being fully
4 specified public format and all. So I think that -- you
5 know the way I read it is philosophical. You know there
6 should certainly be an intent that the electronic
7 records are used for auditing but also to help aide
8 intergratability to the extent possible as sort of
9 defined in 16.

10 So we certainly wouldn't want to preclude that and
11 I think that John's statement that additional language
12 in chapter 5 is necessary to expand upon that and
13 clarify that. Whether that results in specific
14 requirements that don't exist, we are not going to
15 resolve that in real time and it may not. It may be
16 just clarification in the intent and what this means.

17 Unless a TGDC member disagrees with me, I would say
18 that -- I will propose the intent of the TGDC is to
19 maximize intergratability across all systems, across all
20 records. And with that, one should then look at chapter
21 5 as to the additional text necessary to try to

1 harmonize that with chapter 16. Is that a fair
2 assessment?

3 MS. QUESENBERRY: This is Whitney. And just to
4 beat the HFP drum, one of the kinds of technologies that
5 benefit from published records in a common format is a
6 systems technology.

7 MALE SPEAKER: That is correct. I understand
8 Patrick's presumed disappointment that we weren't able
9 to at this stage to pick a particular format to
10 recommend, that we require the vendors to use. I would
11 certainly expect at the next incarnation of this
12 committee and I am sure there will be one, we would be
13 in the position to be able to mandate a particular
14 format. I would hope that the industry and NIST and
15 everybody else worked towards achieving this as soon as
16 possible because there are lots of benefits to be
17 obtained.

18 MR. GANNON: Patrick Gannon. Just as a quick
19 follow-up to the issue of the review of this chapter,
20 whether simply open it to the public or specifically
21 requested from the technical bodies as invited in the
22 Oasis committee and the IEEE working group, is it the

1 fact that the current VBSG May 2007, published publicly,
2 it is the intent of the TGDC that we request or that the
3 public is able to send comments?

4 DR. JEFFREY: Let me, the public has always been
5 able to send in comments throughout the whole process.
6 Vote.nist.gov --

7 MALE SPEAKER: (Off microphone)

8 DR. JEFFREY: What?

9 MALE SPEAKER: (Off microphone)

10 DR. JEFFREY: Sorry the email is voting -- the
11 website is vote.

12 MALE SPEAKER: And then it gets posted at
13 vote.nist.giv.

14 MALE SPEAKER: We have a page, it is publicly
15 accessible page off of the main page that you know, we
16 basically list comments, emails sent to the TGDC there.
17 We benefit greatly when that happens.

18 DR JEFFREY: So we encourage the public to
19 provide comments during this period. This is not to
20 take the place of the formal public comment period,
21 which happens after this gets provided to the EAC. But

1 we always benefit from the input from the public on
2 this.

3 MR. MILLER: This is Paul. First quick comment
4 to follow-up on Patrick's and then I have a question
5 that will probably change the course of this discussion.

6 Of we are concerned with intergratability or
7 interoperability, the key from an election standpoint,
8 the key issue that would need to be resolved is the
9 ability to do a ballot layout once, and then the
10 different equipment be able to use that ballot layout to
11 initialize their ballots for presentation. And I think
12 that that is the area that has been the most difficult
13 to solve and it would also require a definition of what
14 are the fields and what are the kinds of information
15 that is needed by the different systems in order for
16 them to initialize a ballot definition on their system.
17 I think that is a fairly complex issue that we are
18 probably not going to solve in the near future.

19 The questions that I have got is I think a softball
20 question for you. I think I understand what you are
21 talking about when you talk about an election public key
22 certificate at the polling place and some of those

1 issues but I would like for you to verify for me that
2 this does not require complex calculations by the poll
3 workers, that it is simply what the machine does.

4 MR. BURR: Yes, it is what the machine does.

5 We do not expect poll workers to do complex math
6 problems, even on paper.

7 DR JEFFREY: Bill I think you just hit that one
8 out of the park.

9 Thank you Bill. With that, I think John that was
10 the last of the issues that you required input on for
11 today. So with that, I open this up to any TGDC member
12 that has any additional issues otherwise we have
13 completed the formal parts of the meeting. Ron?

14 MR. RIVEST: This e-poll book issue, do we want
15 to address that here?

16 DR. JEFFREY: Are there issues on that that were
17 not addressed yesterday, that are still open? There
18 were some that we sent back to the STS. Are there
19 additional issues that we didn't discuss yesterday?

20 MR. RIVEST: It is open. It was sent back to the
21 STS. There were some discussions in the halls last
22 night and so on, that maybe could be recounted here. It

1 might be an issue that we can make progress here if we
2 have time to do so.

3 So we have the question as to e-poll books, they
4 are networking together with each other, with a
5 statewide database perhaps and then their functionality
6 as a ballot activation device. And the question is
7 within this cloud of possibilities which ones maybe pose
8 undue security risks and should be disallowed and how to
9 manage some of the issues as we start creeping into this
10 area of talking about e-poll book management as well.

11 I am trying to recollect some of the thoughts we
12 had last night when we were talking about this. There
13 was certainly for example the issue with wireless, that
14 once you have this e-poll books working as ballot
15 activation devices and that is really when we have the
16 rubber meet the road here, when we have them as ballot
17 activation devices they are part of the voting system
18 that we are considering for this version of the standard
19 and we need to think about what requirements fit.

20 So for example having no wireless on an e-poll book
21 that is serving as a ballot activation device I think
22 follows automatically from things we have said, I just

1 want to point that out as being a consequence and to be
2 clear about that. I think that is the appropriate
3 requirement, but that is one of them. I don't know if
4 that needs discussion but we can talk about that one.

5 Another one would I think be a natural requirement
6 is if you got an e-poll book that is networked outside
7 of the poll site, then it should also not be networked
8 within the poll site to the voting station. I think
9 having a network activity like that is asking for too
10 much trouble. So you would want some sort of air gap,
11 some indirect mechanism of doing the ballot activation
12 in that case, a token that is carried by the voters. So
13 I think that is another place where I think we could
14 probably easily have agreement.

15 And then the question is you know, what about the
16 reliability and security concerns. Given that you have
17 those two requirements, how do you proceed? One option
18 in the style that we have dealt with other issues is to
19 have you know a switch that says, you know, whether --
20 an election official could switch as to whether you
21 allow ballot activation or not. You could turn it on or
22 off so this could become an option for them.

1 That is another way of handling some of these
2 difficult issues where there is obviously benefits to
3 election officials and having the poll books perform the
4 ballot activations but also risks that, you know, maybe
5 that judgment call is one that we need not make here and
6 it could be passed on to the election officials in each
7 state as appropriate to judge. We are going to assume
8 that risk. We have suitable backup procedures and so on
9 to take that risk or not and we will just disallow it.
10 That to me is maybe a very workable proposition. And
11 let me put that on the table for discussion.

12 I think the only other aspect of this is to have
13 backup capabilities. If you have got a poll book that
14 is networked, you run the risk that for whatever reason
15 the network cause those poll books to become non
16 functional either because they require the network to
17 perform their functionality or because there is some
18 sort of problem on the network, or whatever. And then
19 the question is if you are an election official how do
20 you continue running the election should those poll
21 books become non functional or disconnected from the

1 network. It would require some sort of backup
2 capability in that case.

3 Those are the issues that I see and I thought we
4 could make progress with further discussion here.

5 MS. QUESENBERRY: This is Whitney. I think we
6 heard yesterday and continue to hear in the halls about
7 a lot of the benefits that this could offer for the
8 accuracy of elections and I think as you stated it as a
9 switch but I think we could certainly offer the option
10 in many other cases for election officials to make
11 determinations about which capabilities they use and
12 don't use. I think that is essentially what we are
13 saying here.

14 I hope that we are not so afraid of technology that
15 we don't take advantage of the opportunities it gives us
16 and that what we can do figure out ways to protect --
17 create a protective environment in which we can take
18 advantage of those.

19 DR. JEFFREY: This is Bill Jeffrey and I will sort
20 of echo some of that. Given that the reliability issues
21 that Britt brought up yesterday which were good ones
22 which would require some sort of secondary backup at a

1 minimum coupling that with the option so that election
2 officials can decided area by area whether they want to
3 use or not use it or if there is some external issues to
4 indicate that they should not be using it, that could be
5 a real time determination. It might be a good way of
6 trying to balance the ease of use, the accuracy to
7 provide as well as the security that one may want to
8 obtain.

9 In terms of the other issues, since I think we
10 already have in there that voting systems cannot be
11 networked to the outside so I think that having it
12 hooked up to the activation which is then hooked to the
13 outside would violate that, so I think that is covered.
14 That is something that we can kind of double check and
15 make sure that that is very clear and similarly on the
16 (unintelligible) I think we would just have to check and
17 make sure that we have actually captured. John.

18 MALE SPEAKER: Well you were getting to this. If -
19 - the thing that is difficult for us and this issue is
20 that if ballot activation is part of the voting system
21 definition, which it is, and if ballot activation is
22 going to be done e-poll books which it is, then we have

1 requirements that in general apply to the voting system,
2 voting system devices.

3 E-poll books are a relatively new thing that we
4 haven't really looked at very thoroughly until just the
5 past couple of months so we don't have functional
6 requirements for e-poll books and we have written are
7 other core requirements, human factor requirements
8 without having e-poll books directly in mind.

9 Now already we are hearing that for example there
10 should be no wireless on e-poll books if they are part
11 of the voting system. And it sounds as if we have to
12 figure out how much of our requirements then should
13 apply to e-poll books or not. Or whether we should have
14 a series of requirements such as, you know, in general
15 the core requirements do not apply to e-poll books,
16 human factor requirements do not apply to e-poll books
17 except wireless, and on and on.

18 This is problematic I think for us, maybe I am
19 making more of an issue than there really is but it is
20 in my mind and maybe in a few others a bit problematic
21 and we might need some additional clarification from
22 you. Whitney, for example I brought up human factors

1 and I just don't know how that would apply to e-poll
2 books.

3 MS. QUESENBERRY: Well we haven't considered the
4 human factors of any ballot activator let only an e-poll
5 books so that is where we are. I think what Ron said
6 was pretty interesting which is that, there is this
7 concept of an air gap which is if you want to have the
8 e-poll book network you can't also network it to the
9 voting stations and the gap is filled by token that gets
10 passed. There is obviously some risks across that token
11 but maybe they are great deal less than having a wire.

12 So I think the -- I hear you about the sort of
13 broader issues but I think the most important thing that
14 we can do as a committee is to help think about what are
15 the conditions in which an e-poll book cab be used to
16 activate ballots in way that reduces the obvious and
17 crazy risks but lets us take advantage of the
18 functionality. I don't want to say you are making too
19 much of it because obviously we do need to look at the
20 implications of anything we write but it is not like we
21 have a whole section on other ballot activation devices
22 and we just haven't considered e-poll books as an

1 activation device. So I wonder if this is something we
2 could quietly leave.

3 MR. WAGNER: Dave Wagner. It seems to me the
4 more useful thing to start with is to think about what
5 are we trying to achieve and then we can later think
6 about how the words in the standard would be written to
7 achieve that. I think Ron was opening a discussion of
8 what are we trying to achieve.

9 MR. MILLER: I appreciate Ron's discussion and I
10 do think that what we have here is a clear policy issue
11 in terms of balancing the very clear prospect of having
12 more accuracy in an election. And I would like to make
13 that clear for a moment because I think the security --
14 we have also been real clear on the security risks that
15 are involved here as well.

16 From an election official's standpoint, the
17 prospects of increased accuracy are very clear to us.
18 We are very familiar with poll workers handing the wrong
19 paper ballot to a voter. And the implications of
20 handing a wrong paper ballot to a voter is the voter
21 won't be -- doesn't have the opportunity to vote on some
22 of the contests that they are actually eligible to vote

1 on. That is on one side and on the other side they will
2 vote, they have the opportunity to vote in contests that
3 they weren't eligible to vote on.

4 Just as poll workers will hand the wrong ballot to
5 a person, poll workers will type in the wrong code and
6 wind up in exactly the same circumstances, issuing the
7 wrong ballot to that voter. And so clearly being able
8 to have the activator connected directly to the voter
9 registration file so that when they burn the code, that
10 code is the correct one for that voter, is an advantage,
11 in terms of accuracy.

12 But as Ron has very persuasively presented I
13 believe, there is also a security risk and I think we
14 have a clear policy decision here and the suggestion, as
15 I understand it is basically to move it forward allowing
16 the election administrators and so forth to make that
17 policy decision.

18 MS. PURCELL: Helen Purcell. I would have to echo
19 what Paul has just said. I think what we are looking at
20 is greater accuracy in our polling places. And it is
21 difficult to get the poll workers on a general basis to
22 do everything exactly right. And this would facilitate

1 as Paul said, making sure that that voter got the right
2 ballot. We know that they have gotten the wrong ballot
3 from time to time. This is a tool that I think is a
4 very good tool that would allow us to do this. But I
5 think that we do have to leave that decision as to how
6 the connectivity would be to the discretion of the
7 election official.

8 DR JEFFREY: I heard accuracy, reliability and
9 security and I just want to add privacy to that list.
10 That whatever is fed into the machine is sort of a one
11 way feed. And I know we talked about that in the last
12 meeting and I believe the subcommittee is still working
13 through some of that. So it sounds like accuracy,
14 reliability, privacy and security is, and not
15 surprisingly the top level things that I have heard.

16 I will continue then out on a limb, given the
17 balance between these things, there is clearly creative
18 tension between the security and -- primarily between
19 the security and the accuracy. You know, I am not sure
20 that there is a way to maintain the accuracy at the
21 moment without the network at least not for early
22 elections or for regional voting systems. So if there

1 is a creative solution again it is going to have to
2 clearly require a lot more dialogue within the
3 subcommittee to try and think through these issues of
4 trying to preserve accuracy while maximizing security.
5 And I phrased it that way as opposed to the flip side
6 because that is what I think I am hearing from election
7 officials. Any other comments?

8 I don't know if that added value to the discussion
9 Ron.

10 MR. RIVEST: It is helpful I think. The idea of
11 leaving it to the election officials seems to be
12 something of a comfort zone. And I think maybe we can
13 expect if the TDGC is comfortable with it without having
14 us go back and take that as the primary option to be
15 considered on drafting this, as the most likely
16 approach. If a creative solution comes up that somehow
17 sort of balances things better we can report back but I
18 think maybe leaving this policy to the election
19 officials is the right way to go.

20 DR. JEFFREY: This is Bill. Again tossing it out
21 into a technical area I know absolutely nothing about
22 it, one of the comments you made yesterday about the

1 token, essentially you know if it had a gigabyte of data
2 on it, the kinds of things it could do. It doesn't mean
3 that one cannot put requirements that are testable on
4 the token to have a much less amount of data. I don't
5 know what the maximum amount of data is that it would
6 encompass ballot activation, you know one could minimize
7 by putting more requirements on the token.

8 MR. RIVEST: This is Ron Rivest. You are right.
9 There are some engineering considerations as to what is
10 available on the market and these days even the smallest
11 chip seems to have so much memory that you could violate
12 thousands of people's privacy on one small chip.

13 DR. JEFFREY: Patrick?

14 MR. GANNON: This Patrick Gannon. Are we open
15 for other new topics before we close?

16 DR. JEFFREY: Yes.

17 MR. GANNON: We have been providing a lot of
18 critique and feedback to NIST on the VBSG. I would like
19 to commend NIST for one of the sections, not in the VBSG
20 but part of our handout material and that is the matrix
21 correspondence of TGDC resolutions to NIST for product,
22 their May 9th report. Following a resolution that we

1 took in January of 2006, NIST has been quite diligent in
2 updating the matrix. And I would assume that it is no
3 small task and I would like to commend NIST for
4 maintaining that and updating and publishing it. It is
5 nice to have that available to review prior to each of
6 our TGDC sessions. So if you would please note that
7 commendation to NIST for doing that.

8 My second comment on this, is at the end of the
9 textual section of that, it was published May 9th, it
10 has Number 2 Resolution Task Matrix and the final
11 sentence reads "finally this matrix will be supplemented
12 in the final draft of the VBSG recommendations sent to
13 the EAC with a second matrix that maps requirements to
14 specific resolutions." So my question is where in the
15 VBSG will this matrix be inserted?

16 MALE SPEAKER: It was a result of the resolution
17 that was passed. The intent was, as I believe because I
18 don't have the resolution in front of me, is that it
19 would go in an appendix. That it would be part of the
20 document in an appendix.

21 DR. JEFFREY: This is resolution 01-06. "NIST
22 shall prepare a brief report that tracks the resolutions

1 passed by the TGDC with the progress of standards
2 development and specific work products of NIST. After
3 the initial publication, reports will be provided to the
4 TGDC prior to each public meeting and will be included
5 as an appendix to all NIST and TGDC work products sent
6 to the Election Assistance Commission."

7 MALE SPEAKER: If I may add my two cents, when we
8 internally hear the word appendix we are not necessarily
9 thinking of the VBSG. It could be that way but our
10 preference is to basically limit what is in the VBSG to
11 the requirements and what is necessary. We could
12 provide it as a separate document and I think it would
13 still be just as good as if it were an actual appendix
14 of the VBSG.

15 MR. GANNON: What I am trying to understand here,
16 is when -- the statement here, not reading the actual
17 resolution itself, which is matrix will be supplemented
18 in the final draft of the VBSG recommendations. So it
19 seemed to indicate that maybe when you put into Volume
20 1, chapter 2, where it talks about history of the
21 requirements, as a way -- or somehow indicate it because

1 we do talk about requirements in there. So the question
2 is how it is going to be updated, where will it appear?

3 DR JEFFREY: This is Bill. Let me ask you
4 question Patrick? Do you think that it should go into
5 the body of the VBSG or should it just be provided as
6 supplementary material but not actually part of the
7 physical VBSG?

8 MR. GANNON: I guess I am less concerned,
9 although I would open it up to other TGDC members to
10 comment on it as to physically where it goes, but the
11 question of a review by the TGDC at our next meeting, if
12 that is going to be our last meeting before this goes
13 forward, for this as an agenda item to review, to go
14 through and say have we finalized all of these. Because
15 right now as of today only about 20 percent are marked
16 completed. So between now and end of June how many more
17 of those will be completed and are we all in agreement
18 as to the status and completion of those.

19 So I would also ask that there be an agenda item at
20 our next item to review the matrix and then I guess at
21 some point between now and then a decision made as to
22 whether that matrix is included in some section or

1 appendix of the VBSG or simply a separate document that
2 we all review and comment on.

3 DR. JEFFREY: This is Bill. I certainly agree to
4 the agenda item. I think that makes a lot of sense.
5 Whitney?

6 MS. QUESENBERRY: You might think about Volume 6,
7 which is almost entirely taken up with the listing of
8 the requirements anyway.

9 DR. JEFFREY: We should definitely discuss that at
10 the next TGDC meeting as to the disposition of all of
11 the resolutions.

12 Are there any other issues? Ron?>

13 MR. RIVEST: Do we need a resolution like we had
14 for HFP and CRT with respect to STS now that we have had
15 the guidance on the various outstanding issues? Perhaps
16 another resolution would be appropriate?

17 DR. JEFFREY: Let me rephrase that. Did I just
18 hear a resolution?

19 Let me read the resolution that has not yet been
20 seconded. While they cut and paste, but it is going to
21 read essentially, the TGDC grants preliminary and
22 conditional approval for STS sections to be enumerated

1 and I have no idea what they are off the top of my head,
2 subject to final review of the edited and updated
3 material?

4 I assume -- is that the resolution that I heard you
5 say?

6 MR. RIVEST: Yes.

7 DR. JEFFREY: Okay we will have to have somebody
8 develop the appropriate chapters and sections. And that
9 is probably going to take a few -- probably a couple of
10 minutes, because that is spread throughout much more.

11 MS. QUESENBERRY: It actually is pretty easy. It
12 is Volume 3, chapter 4-15.

13 DR. JEFFREY: Four through fifteen I believe she
14 said.

15 MS. QUESENBERRY: And that is it.

16 MALE SPEAKER: (Off microphone).

17 DR. JEFFREY: Okay STS was not as busy as I
18 thought they were.

19 MS. QUESENBERRY: No they were just less
20 scattered.

21 DR. JEFFREY: Is there any TGDC member on the
22 phone at the moment? Okay so I won't have to read it 10

1 times. Okay there is a resolution, it says TGDC grants
2 preliminary and conditional approval for TGDC STS sub
3 committee, probably working with other subcommittees, to
4 complete the STS sections of the VBSG, Volume 3,
5 chapters 4-15 subject to final review of the edited and
6 updated materials. Is there a second for that
7 resolution?

8 VOICE: Second.

9 DR. JEFFREY: Okay there is a resolution that has
10 been seconded it. It is open for discussion. Hearing
11 no discussions, I will bring it to a vote. Is there any
12 objection to unanimous consent on this resolution?

13 Okay Resolution 0507 passes by unanimous consent
14 and congratulations to the STS subcommittee.

15 Are there any other -- Nelson?

16 MR. HASTINGS: I guess I am going to thank the
17 committee for that. I don't have anything else to say
18 other than to provide comments as we go through and
19 continue to look at the material. It is a lot of
20 material I know so thank you.

21 DR. JEFFREY: Okay are there any other issues that
22 TGDC members want to bring up at this point? Yes?

1 MALE SPEAKER: Mr. Chairman on behalf of I think of
2 all of the members of TGDC we likewise would like to
3 reciprocate our thanks and appreciation and gratitude
4 for all of the very, very fine and very, very hard and
5 dedicated work by all of you, which we may not ever know
6 the full extent to which you go to make happen what you
7 make happen. But thank you for all your help. It is
8 obviously a team effort and a partnership and we
9 appreciate all you contribute.

10 DR. JEFFREY: Thank you. On behalf of NIST
11 obviously I would like to thank all of the TGDC members
12 because it is absolutely unbelievable the number of
13 meetings, telecoms and information that is being passed
14 back and forth so these 750 pages just didn't come out
15 of thin air. It was form a tremendous amount of time
16 and effort and since you are all volunteers and
17 conscripted into this, thank you very much. It is
18 definitely appreciated.

19 To reiterate, and move forward, we have got the
20 sort of go head that we are going to start doing the
21 editing, try to get all of the pieces matched together,
22 get the definitions tightened where necessary. Where

1 they are broken -- I forgot the actual word that you
2 came up with --

3 MALE SPEAKER: Ruined.

4 DR. JEFFREY: Where they are ruined, we will get
5 that from the TGDC members as quickly as possible so
6 that we can understand the ramifications throughout the
7 document that.

8 Other than that as we go through this, as each
9 chapter gets edited and gets cleaned up it is going to
10 be sent to all of the TGDC members. Please review it.
11 Please identify any issues or concerns that you have
12 with that. Then at the next meeting which is going to
13 be by telecom hopefully by the end of June and again you
14 have the dates, I believe that Allan has given you a
15 piece of paper, we will be formally voting on the
16 approval and forwarding the document to the EAC or
17 resolving any outstanding issues at that time.

18 Are there any questions on where we go from here?
19 If not I officially call the 9th meeting to a close.
20 And again thank you very much for all the hard work. We
21 have a lot of hard work left in the last few months.
22 Thank you very much.

1 (END OF AUDIOTAPE 6)

2 * * * * *

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

1

2

CERTIFICATE OF AGENCY

3

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

12

13

14

CAROL J. SCHWARTZ

15

16

PRESIDENT

17

ON THIS DATE OF:

18

19

20

21

22