IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, ET AL.,	:	
	:	
PLAINTIFFS,	:	
vs.	:	DOCKET NUMBER
	:	1:17-CV-2989-AT
BRAD RAFFENSPERGER, ET AL.,	:	
	:	
DEFENDANTS.	:	

TRANSCRIPT OF ZOOM VIDEO CONFERENCE PROCEEDINGS

BEFORE THE HONORABLE AMY TOTENBERG

UNITED STATES DISTRICT JUDGE

OCTOBER 1, 2020

9:08 A.M.

MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED TRANSCRIPT PRODUCED BY:

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P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; October 1, 2020.)

THE COURT: Good morning. Counsel, would you just check the extra numbers here -- anyone with an extra number here or person here to make sure everyone here is identified with you. I can see what they appear to be.

Mr. Martin, is this everybody that you have let in?

COURTROOM DEPUTY CLERK: Yes, ma'am, this is everybody.

THE COURT: All right. So if -- the two individuals who are just solely appearing by telephone, can you identify yourselves?

MS. RINGER: Phone number ending in 8737 is Cheryl Ringer from Fulton County.

THE COURT: Okay. Very good. That is fine.

And the person whose number ends in 8993, would you identify yourself.

MR. FRONTERA: Your Honor, can you hear me? This is Mike Frontera, general counsel, with Dominion Voting Systems.

THE COURT: Very good. Thank you very much. All right. That is fine. Everyone is authorized to be on.

Thank you, everyone, for being here. I want to say from the start that we have this now on the platform -- a different Zoom platform, and we are -- I am -- I have authorized the videotaping of the hearing solely for the

purpose of if I determine that some portion of this really should have been on the public record that it can be made available on the record.

Not knowing what was going to be discussed exactly and understanding that there might be some confidentiality issues, I decided that we should just proceed in this way, rather than by making it open and then trying to pull it back. So that is the purpose of videotaping it. I don't really -- normally wouldn't do that.

But under the emergency circumstances here, I have proceeded this way. And I think it is the soundest way of proceeding in that way. And also I can make any portion of this that would be public be available to the public.

Additionally, I want to note though that the videotape is not -- will not be the transcript of record. The only transcript of record of that will be created by Ms. Welch as the court reporter in this matter. And you are not to refer to the videotape at any point as kind of the official record in this matter. And, of course, the transcript will be filed.

I am -- just was, frankly, perplexed by the response that the State filed last night. And I know everyone is busy. I'm not trying to in any way minimize how busy you are. And -- and Mr. Russo already has told me from the start that he has to be out -- that he has to be complete by 10:00.

Are you starting the hearing in front of Judge Brown

at 10:00, Mr. Russo?

MR. RUSSO: Your Honor, that hearing is at 10:00. But we have sent two of our colleagues there to do it so we could be here. So Mr. Belinfante and Mr. Tyson are there, and Mr. Miller and me are here. So you have got us today.

THE COURT: Okay. Very good. Wonderful.

MR. MILLER: And I think the 10:00 issue was specific to Dr. Coomer's availability.

THE COURT: All right. Very good. So please, everyone, bear that in mind as to Dr. Coomer's availability because if there is something that he needs to address early on, whether it is from the perspective of the Court or the State, let's be sure we just jump ahead and get his input.

MR. RUSSO: Your Honor, also, we have the staff from the Secretary's office on standby. We have Mr. Germany, the general counsel, on right now. But Mr. Sterling and Mr. Barnes are -- we told them to continue working since they have election stuff going on and that if you needed something from them we would patch them in accordingly.

THE COURT: That's fine. All right. Well, as I understand it, the -- from what you -- from what the State submitted last night -- and it wasn't on the record. That was just, I think, a letter from counsel. It was that you -- that basically the State defendants were proceeding, that you were sending the software out today -- the software to jurisdictions

across the state, and basically this is a distraction that I was causing, and it was none of my business. Well, that was the tonality of it. It was a quick letter.

But let me just say -- start from the start is that I think I have endeavored to work cooperatively with everyone. I have an order to issue. I need to -- whatever it says, whether it is just simply -- you know, doesn't do anything at all, which is certainly -- you know, given everything I have told you in the past that I am very reluctant to even consider in this election saying, oh, suddenly do a sudden change to the paper ballot.

But I still -- this is still a record. And I don't know what will happen in the days ahead. But I think that the Court is entitled to, with respect, be given the information needed to issue an intelligent decision. And this was a change of circumstances.

And I am -- I don't know who thought I wouldn't have issued a decision without full knowledge of the circumstances that have arisen. I don't mean this personally against anyone. I think everyone has generally been very professional with me. But this is not an acceptable response, and I know everyone is short on sleep and at their wits' end on some things. So I understand it that way. I sure am very short on sleep too.

And there is a lot of stress under these circumstances. So I humanly recognize all of that. And so I

just sort of had to breathe in and say, all right, where are we going from now, once I got the response and just say, all right, you know, without any drama, I want to understand what is going on.

And that -- the expectation I had was not the -- that things were just proceeding and that I wouldn't basically know what was happening.

So I think that is -- just as an initial matter, that is where we're at. I mean, I am, you know, at 95 percent on having an order ready to be timely issued. And I held it back while this is going on.

And, of course, that is why on Monday we issued the order on the one thing that was clearest that needed to be acted upon as soon as possible. But I was holding back as soon as I heard anything was going on.

So let's just talk about what has happened. My understanding from the letter on September 29th that is on the record that -- as opposed to the letter that I received yesterday from counsel that the acceptance testing -- there would be acceptance testing that would occur before there was going to be distribution.

I guess it is a filing now. I'm sorry. I didn't realize that counsel's letter was filed. So excuse me for that.

In any event, I thought there was going to be

acceptance testing before there was distribution. And maybe there was, and maybe I misunderstood what was instead stated in the brief letter.

So, first of all, let's just start off just as to that. Did that occur?

MR. RUSSO: Your Honor, yes. So, first, you know, let me say we filed the letter under seal because that is what was discussed on Monday. As a letter, you said to file it under seal. So that is why we filed it that way.

THE COURT: That is fine.

MR. RUSSO: We didn't necessarily think there was something in there that was attorneys' eyes only or anything to that extent.

THE COURT: All right. Then I will lift the seal. Okay. Fine.

MR. RUSSO: In terms of the acceptance testing, the Secretary of State's office did conduct acceptance testing prior to distribution of the update. That is correct. Mr. Barnes did that. And then the distribution proceeded.

THE COURT: And when did Mr. Barnes do that?

MR. RUSSO: I believe his acceptance testing was done -- conducted yesterday. Mr. Miller might -- might know if it was done yesterday or the day before. Frankly, my days are starting to run together right now.

THE COURT: Yeah.

MR. MILLER: Your Honor, I believe it was done Monday and Tuesday. And so the kind of process through that -- the acceptance testing was, you know, essentially receiving the application from Pro V&V and running through just a typical acceptance testing and, you know, primarily ensuring also that the rendering issue that was discovered in logic and accuracy testing was not recurring.

And, importantly, you know, there's -- acceptance testing was not the only thing being done. The voting system test laboratory was also doing its part.

And, frankly, Your Honor, as to the filing, we certainly didn't intend any disrespect. We do, you know, have to note our objections. And, of course, it becomes an awkward situation to do so. And we do appreciate your understanding throughout this thing.

But we also, frankly, understood that you may be seeking the Pro V&V evaluation, which the formal evaluation we just -- we don't have right now. They have completed the evaluation. The written report is not done yet.

MR. RUSSO: That's right, Your Honor. That was in our filing yesterday. And we didn't -- you know, we expect that report -- to have it by the end of the week.

To the extent there is any delay from Pro V&V getting us the report, we just didn't want, you know, there to be any -- any misunderstanding about a delay if we made that

representation. But we do expect it by the end of the week, and we will file it upon receipt.

In terms of the EAC issue, you know, the order said to file -- to file anything that is filed with the EAC, presuming a filing is made with the EAC. Dominion actually does -- Dominion would make the filing with the EAC, not the State. And Dr. Coomer can speak to that.

But there appeared to be some misunderstanding in counsel's email yesterday regarding the EAC filing. But to be -- to be clear, we -- since it has not been filed yet, we didn't have any update for you. But that is a Dominion issue, not a Secretary of State issue.

THE COURT: Well, it is obviously the responsibility under the state law still though for you to have an EAC-certified system.

MR. RUSSO: Well, Your Honor, I mean, the update is a de minimis update. So that is according to Dominion.

In terms of what state law requires and what state law doesn't require, I mean, there is not a claim in this case regarding our compliance with state -- with state law. The only state law claim that was in this case was abandoned by plaintiffs earlier and dismissed in Your Honor's order on the dismissal a couple of months ago.

THE COURT: All right. Let me just put it this way. I mean, it is an indicia of -- it is an important indicia of

what is going on and is this -- and from an evidentiary perspective certainly relevant.

So I would -- you know, I went back at least and looked at the most recent regulations issued by the EAC. And I didn't see it as not being a requisite step to -- even a software modification as being requisite. Maybe I will hear differently from Mr. Coomer or Dr. Coomer -- excuse me. And Dr. Coomer is welcome to address at this point where things stand.

DR. COOMER: Good morning, Your Honor. This is Dr. Coomer. Yeah. So I'll try to describe the process again.

So we identified this change. And it was our feeling that it was de minimis. But we do not make that determination ourselves as a company.

So the way the EAC process works is we submit that change to an accredited laboratory, in this case Pro V&V. They analyze the change. They look at the code. And they determine whether it is de minimis or not.

If it is de minimis, then they do whatever testing they need to do to prove the nature of the change and verify it. And then they label it a de minimis change. They write a report. And at that point, it is just submitted to the EAC as what is called an ECO, an engineering change order.

So there is no new EAC certification effort. It is simply updating the current certification for this ECO. And

that is what we --

THE COURT: I'm sorry. ECO? I'm sorry.

DR. COOMER: ECO, engineering change order. And this is a software ECO. And that is how the process works.

So once Pro V&V has the final report, we will submit that to the EAC, Election Assistance Commission, certification as an ECO, engineering change order, for the current EAC-certified system, the 5.5-A.

THE COURT: So the November 15 clarification -- notice of clarification from the EAC that indicates that a proposed de minimis change may not be implemented as such until it has been approved in writing by the EAC, that is meaningless? That is Provision 3.4.3.

DR. COOMER: I have got to be honest. We might be a little bit out of my bounds of understanding of the exact rules and regs there.

THE COURT: And Mr. Maguire, as counsel for you -- it looks like he is present.

MR. MAGUIRE: Yes. That's correct, Your Honor.

THE COURT: Is that said at all?

MR. MAGUIRE: I'm sorry. I'm unprepared to address it, Your Honor.

THE COURT: All right. That is fine. I didn't ask you to be prepared. I just wanted to -- in case you wanted to, I wanted to give you that opportunity.

MR. CROSS: Your Honor, if it is helpful to you, Mr. Skoglund -- this is an area of expertise for him.

Your Honor has hit the nail on the head, which what Dr. Coomer's explanation left off was once that EAC paperwork goes in you still have to wait for approval from the EAC. The EAC has to agree that it is a de minimis change and that it can operate under the existing certification.

If they disagree, then you have got to get a new certification. But until that is approved, you do not have EAC approval to proceed. And Mr. Skoglund can explain that in more detail. So right now they would be proceeding without EAC approval. That is where we stand. That should be undisputed.

THE COURT: Maybe that is what they have determined they must do. But I'll let Mr. Skoglund briefly discuss it. I mean, I think it is sort of evident.

But, Mr. Skoglund, can we -- thank you.

MR. RUSSO: Your Honor, one quick point. O.C.G.A. 21-2-300(a)(3) is clear that the equipment has to be EAC-certified prior to purchase, lease, or acquisition. The ongoing EAC certification that is now being raised, that is not in the statute. But Mr. Skoglund can go ahead and explain the rest of the process.

THE COURT: All right. And I'll get back to you, Mr. Russo.

MR. SKOGLUND: So I would just agree with what has

been represented already. That is correct. You void your certification if you don't have written approval before making this change.

So the correct process is to go to the VSTL, then go to the EAC, have them review it. They are the ones who make the determination of de minimis based on the recommendation of the VSTL. But it is really up to them to decide that. And then they are the ones who bless it as being part of the certification.

THE COURT: Either Mr. Russo or Dr. Coomer, is there any -- has there been any type of contact at this point with the EAC to say you are in emergency circumstances?

DR. COOMER: This is Dr. Coomer. I don't -- I don't believe so. But we were waiting for that final report from Pro V&V. And then that would be immediately submitted to the EAC.

MR. RUSSO: That's right. The Pro V&V report --

THE COURT: I'm sorry. Who is speaking right now?

MR. RUSSO: Vincent Russo.

THE COURT: All right. I'm sorry. We've got a lot of people here.

MR. RUSSO: No problem. The Pro V&V report or Pro V&V has indicated it is a de minimis change. So as Mr. Skoglund mentioned, the EAC will take that report and that recommendation and proceed from there.

But, again, we will file that report with you. And

Dominion will move forward with its piece in reliance on that report.

MR. MILLER: Your Honor, I do also just want to point out briefly that, you know, EAC certification is not necessarily across the board. There are other states that don't have EAC-certified systems. Of course, we're still seeking to -- Dominion is still seeking to obtain the certification. But I did just want to point that out for the Court as well.

THE COURT: This is a -- obviously, it is a provision the EAC has because it is -- no matter whether you call it de minimis or not, it always obviously raises issues when you change a piece of software and then you have to redo everything.

You are obviously all doing testing, and I am glad that you are doing the testing. But the fact that you could be in a place that doesn't require anything is one thing. But, you know, we are using a statewide system. So it has larger repercussions when you have a statewide system also.

All right. And so the software -- the new software is supposed to be distributed today. And what is the schedule from -- since you have said you are going forward even without the EAC approval or without seeing the actual testing documentation, what is your next plan? What is going to happen next?

MR. MILLER: Your Honor, it was distributed yesterday, I think, with the dropoff. And which also I do want to briefly mention, you know, we sent an email about the confidentiality of the dropoff process.

At this point, that is no longer confidential. It was the prior to -- you know, it is a schedule of secure transfer of files that was filed on the public docket. And so that is the issue. I did just want to make sure we don't have a loose thread there.

But in terms of the process next, the counties will begin engaging in that logic and accuracy testing that was put on pause after the last issue was discovered. And so we started that. The counties will also verify the hash value on the software that was given to them, which has already been verified by Pro V&V, the hash outside of the system at the Center for Election Systems, and additionally a hash again outside of the BMD system before those software was copied to the drives that were sent to the counties in sealed envelopes -- sealed, numbered envelopes via the post-certified investigators connected with the Secretary of State's office who met their county liaisons at Georgia State Patrol posts. That was --

THE COURT: What was verified at the Georgia State post?

MR. MILLER: That was where the transfer occurred.

So when the software was received -- you know, Pro V&V conducted their verification and validation, provided the trusted build hash to the Secretary's office. The Secretary's office then compared that trusted build hash to the hash of the actual software they had received outside of the BMD system.

You have heard here before the concept that the BMD can trick you into saying that the hash is verified. But, again, this is wholly outside of the system such that that is -- that is a separate issue entirely.

After that delivery to the counties, the counties will also verify the hash and will then conduct their logic and accuracy testing.

THE COURT: All right. All I was asking was when you said something was verified when they picked it up at the Georgia State Patrol.

That was just the sealing -- the seal of the envelope?

MR. MILLER: Your Honor, yes. So the envelope was sealed by -- right, was sealed by the Center for Election Systems. And then the investigators of the Secretary's office met county superintendents at Georgia State Patrol posts.

THE COURT: Okay. That's fine. Have you in any way expanded the scope of your logic and accuracy testing in light of these circumstances?

MR. MILLER: Your Honor, so I think -- I guess I

would separate it out briefly in that the Center for Election Systems conducted their own sort of modified logic and accuracy testing, which I referred to earlier as logic and accuracy testing within CES, on BMDs that they themselves had that have never been used in elections to verify that -- first of all, that that same issue was not recurring but also to continue the logic and accuracy testing such that -- to confirm that there were no ancillary issues brought in to do so.

At the time it is sent to the counties, the counties will then conduct their logic and accuracy testing, which now also includes before inserting anything into the BMD verifying that hash number, verifying it is the correct software. That is kind of the initial step, which I believe -- I don't have the letter in front of me. But we laid out kind of that first couple of steps of the logic and accuracy testing.

THE COURT: All right. But you haven't decided at this juncture -- to your knowledge that there have been no change in the logic and accuracy testing protocols or just going from one electoral race to the next in the machines so that you don't do the entire ballot on every -- on a larger number of machines in each of the counties?

And that is the process you-all described, one race for one and then round-robin.

MR. MILLER: And I'm not sure I can speak to any of the -- any detailed adjustments. What I will say is the

testing that was done within CES included five different ballot styles that were chosen from Dekalb County being a county that would have large ballot styles -- basically, you know, a number of races, number of different types of ballots on there. And then they were conducted on those different styles and also conducted on the four different machines and printing out basically hundreds of ballots to confirm the testing.

THE COURT: Well, as far as you know, there has been no -- no one has considered trying to test a larger range of the ballot -- the full ballot in a larger range of machines as testified to in -- at the hearing and which was the protocol that Mr. Harvey indicated was the protocol in his testimony? Is that right?

MR. MILLER: Your Honor, as I understand it, the full ballot is tested on all of the machines.

THE COURT: That wasn't his testimony. The testimony was -- is that one race -- you picked a race. You went to the next machine, and it would do the next race. And then you would -- if you exhaust the race, which in Georgia you probably wouldn't exhaust the race, you would start with the next one -- if you had 12 machines, you did the 12 first races. Then you would go back to Number 1 machine, and you would go -- and it would do the 13th race. Then it would go to Number 2 machine, and it would do the 14th race.

That is what I'm getting at. So that, really, you

have a fraction of the machines that are actually doing the race at issue. But it might screw up other races. So that is really what I'm trying to get at.

But it doesn't sound like there have been any change in the process, in any event, from what you know.

MR. MILLER: Your Honor, I would defer to the testimony and the written instructions on logic and accuracy testing. But yes. To answer your question, I couldn't comment as to any sort of very specific minutia within that.

THE COURT: All right. I'm really not asking you to testify yourself as to it.

As far as you know, no one has indicated to you that they changed any of the --

MR. RUSSO: That's correct, Your Honor. As far as we know, the process is the same as Mr. Harvey has discussed previously.

THE COURT: That's all I'm trying to get at.

MR. RUSSO: You know, with respect to printing the ballots and each race that we discussed at the hearing, that hasn't changed. The only change is with the logic and accuracy testing are to ensure that the hash value -- check the hash value of the new software and the version on the front end.

THE COURT: And does Dr. Coomer know what was -- what type of testing was done on the software at PV&V?

DR. COOMER: Your Honor, I'm not sure of the complete

test plan that they completed. Again, Pro V&V themselves determine what test plan is necessary based on their analysis of the code itself.

THE COURT: They didn't tell you?

DR. COOMER: I don't have the details. I would just -- I could probably get that. But I don't have the details.

THE COURT: When did they complete it?

DR. COOMER: I believe they completed that either late Monday or Tuesday.

THE COURT: Do you know who was performing the testing there?

DR. COOMER: The individual employees' names, no, I do not.

THE COURT: I mean, is there a head of the unit that deals with security or not at this point? Because we had very vague testimony of that at the hearing.

DR. COOMER: I don't know the makeup of Pro V&V's employees.

THE COURT: And do you have a backup plan in case, in fact, there are issues that are arising in connection with this? I mean, you are hoping for the best. You are thinking the best will occur. But what -- if there are issues again, what is the plan?

DR. COOMER: We'll work with our -- we'll work with

our partners at the State to do whatever is necessary.

MR. RUSSO: Your Honor, this issue, as you recall, came up as a result of this U.S. Senate special election having too long of a -- too many candidates and the Secretary of State not wanting to have any candidates claim that they were unfairly treated by being on the second page because surely someone would say that by being on the second page they lost votes.

We are not aware of any other issues with the BMDs that would change, you know, the processes going forward. I mean, Mr. Barnes conducted logic and accuracy -- his logic and accuracy testing -- his acceptance testing I should say -- on the machines.

The machines will go through acceptance testing. If anything new is discovered in that process, we'll, of course, have to address that. But we have no reason to believe at this juncture there is anything new since this issue with the ballot -- the number of candidates being on one screen has been resolved.

THE COURT: Dr. Coomer, did you get an opportunity to read Dr. Halderman's affidavit that was filed that if it really was just simply only the first time ran on a machine why wouldn't it have been adequate essentially to address this by just basically running it the first time?

DR. COOMER: Well, so there is a

mischaracterization -- I'm not sure where that came from. So I did not have a chance to --

THE COURT: Uh-oh. Everyone put themselves on mute, and we'll try to --

DR. COOMER: So I didn't read -- I didn't have time to read the entire declaration. But I will say that -- and not to disparage Dr. Halderman whatsoever. But he is making assumptions when he does not have an understanding of the actual issue.

If I had time and charts and I could work on a whiteboard, I could explain exactly what the issue is. But it is not that it happens the first time. I said that it only happens once -- can -- not that it always does -- but can happen only once during a voting cycle. And that is a power cycle of the machine. It is a rare occurrence that based on -- not just the ballot layout but, you know, the sequence of how the voters have gone through the ballot.

There are essentially some indexes that are created by Android operating systems. And we have an index that we are referencing. And if there is a collision between those two, the issue happens. And it can only happen once because Android keeps incrementing these indexes.

So it can only collide once. And there is a very specific set of circumstances that leads to this collision. And it doesn't happen every time.

Our analysis showed us how to actually reproduce that deterministically. So I have seen some other things -- I'm not sure if it was in Dr. Halderman's declaration or not -- that we didn't understand the root cause of this and it was undetermined how and when this could happen. And those statements are not correct either.

So this is why we felt very confident in this change because it is very minimal. Instead of referencing this particular ID, we reference it now as what is called a tag. There is no collision possible between our tag and these Android IDs.

And then just to hit on this point, you know, asking what if something else happens, well, this version -- you know, the certified version that is being used in Georgia has been -- has been used by millions of voters across the U.S.

This is the first time we have seen this issue. And, again, it is due to the unique layout to handle the special Senate contest with the two columns of candidates.

So I just wanted to sort of make that known. You are still on mute, Your Honor.

THE COURT: Can you explain to me what the -- to make sure I don't misunderstand what you mean by power cycle, is it -- basically it could happen every time that -- is it when you turn the power on and then the next time when you turn the power on?

DR. COOMER: Correct. Yeah. When you turn the power off and you turn it back on, Android starts those indexes back over.

THE COURT: All right. Then does it happen each time just in the beginning or any time in the cycle? That was the other part that was a little confusing to me because I had thought you indicated before or somebody had indicated it was right at the start of the cycle.

DR. COOMER: No, it is not right at the start. Again, it depends on a variety of factors. So, you know, it depends on the number of -- the number of display elements that are on the ballot itself and how the voters walk through.

So it could be -- it could be several voters. And, again, it doesn't happen all the time because you have to have this unique overlap, you know. And that is wholly dependent on, you know, the sort of behavior of the voters going through the ballot of whether they just happened to hit on this unique circumstance. But it is not -- it is not necessarily within, you know, X number of voters.

THE COURT: Okay. And it is not -- so if you -- it is not dependent on the fact that this is the first time you've -- it is not the first ballot in any event?

DR. COOMER: Correct.

THE COURT: It is not the voter who gets -- who is the first one in line who gets it necessarily?

DR. COOMER: Correct.

MR. CROSS: Your Honor, could I ask a quick clarifying question?

THE COURT: Yes.

MR. CROSS: I just want to make sure I understand. On Monday, Dr. Coomer said -- he said this happens only once for one voter during a complete machine cycle. That was where Dr. Halderman's understanding was coming from.

So is it right that it is not just once for one voter during a machine cycle? It could happen more than once?

DR. COOMER: No, not during the machine cycle. When I say machine cycle, I was referring to power cycle. So it can only happen once.

MR. CROSS: So then why is Dr. Halderman wrong? Why couldn't you just power it on?

DR. COOMER: Because once is not the same as first.

(Unintelligible cross-talk)

MR. RUSSO: We are here to answer your questions, frankly. Plaintiffs can go do discovery if they would like to. We are in discovery. So you can continue to answer for now. But I did want to raise that before we --

THE COURT: I think -- Mr. Russo, I appreciate that. But it was -- I certainly had the impression that Mr. Cross did too. So I'm very happy that Dr. Coomer is explaining it.

So if Mr. Cross had a misunderstanding too, then I

think he is entitled to try to --

MR. RUSSO: And that is fine. I just wanted to make sure before we got too far down this road that I raised this.

THE COURT: All right.

MR. CROSS: So, Dr. Coomer, all I was asking you: It will happen only once in a power cycle, but you don't know when it will happen, meaning you couldn't just do a single test ballot? You would have to do test ballots until it happened the one time and then you --

DR. COOMER: Right. And, again, to be clear, it doesn't always happen. Right? It is this unique way of going through the ballot. So you could -- you could say, oh, I'm going to wait until this happens and it never happens because you have passed those conditions.

MR. CROSS: Got it. Okay. Thank you. That is really helpful, Dr. Coomer.

DR. COOMER: Sure.

THE COURT: So -- and maybe one has to have Mr. Barnes here or someone else from the department present. So I'm just trying to understand how the logic and accuracy testing that is being performed at this juncture mirrors that -- those conditions since it is not necessarily the first time it has been done.

What were -- what are the instructions to make sure that it doesn't happen, partially because, you know, the point

really is the size -- the vote should be counted properly is you just don't -- it could -- there are repercussions if it does in terms of people getting confused at the polls and other sorts of problems that can happen there that it triggers -- the people are worried about their votes and one comes to a halt, et cetera.

MR. CROSS: Your Honor, could I ask one more question?

Dr. Coomer, you mentioned that you could do -- you figured out a way to do it deterministically, which means you could trigger it. Would that work to -- rather than doing new software, could the counties trigger it using this deterministic approach? Then you could trust it wouldn't happen again with the existing software. Would that be a fix?

DR. COOMER: I mean, that is -- theoretically, that is possible because it depends on, again, a lot of variables. So each -- you know, obviously each county and each machine has -- may have a different set of ballots on there.

So like -- so what we did is -- obviously, this was identified in two counties. And we know the ballot styles that they were testing in those counties. So we zeroed in on that and found a way using those two projects how to make it happen.

We would have to do that for every machine in every location because it is dependent on the ballots that are in that machine to then want to determine whether you could make

those IDs collide.

Does that -- does that clarify? That would be, again, theoretically possible. A nightmare. And then that whole process would have to be done every time the machine is turned on.

THE COURT: Let me start this way simply: You-all did some logic and accuracy testing yourself when you were trying to do the software modification?

DR. COOMER: Oh, extensive testing. Extensive.

THE COURT: All right. How did you modify -- how did you do it so that -- in light of these circumstances in terms of the protocol so that you would -- it would be at least randomly captured?

DR. COOMER: Right. So -- well, the first thing we did is obviously analyze the projects where it was -- where the issue arose. And that led us to figuring out what the root problem was.

Then our initial testing was we actually set up a quick project where -- knowing how the code behaved we knew exactly the steps to take within a few clicks to make this issue happen. Right? And so we set that up, verified on multiple machines that we could make it happen according to step A, B, C.

So then we applied the change and then redid those steps, verified that that issue no longer arose, and then we

took that back to, you know, the actual -- some of the actual real Georgia elections that would be tested and ran full regression tests over several days to verify that nothing else was impacted.

THE COURT: You ran full regression tests to determine what? I didn't hear the last part of your sentence.

DR. COOMER: That no other functionality was impacted.

THE COURT: So have you made any recommendation to the State regarding any additional measures that should be taken in order to test the functionality of both the fix as well as that it didn't impact anything else?

DR. COOMER: So I don't -- I don't know all of the information that was communicated to the State. But I believe we did -- again, as I mentioned, we had those two counties where we -- you know, where the issue was experienced. We know how to make it happen in those two counties. I believe we provided those steps to the State for verification. But, again, I'm not the one that is actually communicating the operational aspects directly with the State.

And then as far as the other functionality again, the pre-logic and accuracy testing process we feel is enough to verify that the system as a whole is still functioning as it should.

THE COURT: Let me just say that in your testimony

before this Court you indicated that you had not been aware that -- that the full ballot had been tested in each machine.

So I guess would it be wise to have more of the full ballot tested in every machine? I mean, for instance, among other things, this particular race?

DR. COOMER: I'm not sure -- I'm not sure I'm following. But, again, you know, the logic and accuracy testing that I'm aware of from the State I believe is adequate.

THE COURT: I don't want to get into a cross-examination with you myself about that. But you do understand that there is only a small fraction of the machines each that are tested for -- for instance, as to this particular race that are going to be out in the field?

DR. COOMER: Again, I don't -- I don't know every single detail of the L&A that they are doing.

THE COURT: All right. That is fine. Then we'll just -- we'll stop at that then.

Mr. Russo and Mr. Miller, is there anyone who is familiar with the -- what the instructions have been to the field with the State available just to talk for -- speak for a minute or two?

I know Dr. Coomer has to leave in four minutes. So before we do that, I want to make sure that there is not anything else that counsel wish for Dr. Coomer to address.

MR. BROWN: Your Honor, this is Bruce Brown. I have

one question for Dr. Coomer.

Our information is that the version of the software that was certified was .30 and the current version is .32.

What was .31, and what is .32? And have the incremental changes from the various versions been tested, certified, or approved?

MR. MILLER: Your Honor, we're just going to raise the same objection earlier as far as cross-examination of the witness right now.

THE COURT: Well, I think it is --

DR. COOMER: Version numbers change for a variety of reasons. I'm not even sure what that question is trying to get at.

THE COURT: Well, it is trying to understand if there have been software change or some other change between the 5.5-A, I guess, .30 and 5.5-A.32, which this is. In other words, what happened -- do you know what was .31?

DR. COOMER: There is absolutely no other change than the one we supplied that we alluded to.

MR. BROWN: So why are there two version numbers?

DR. COOMER: There is not two version numbers. There are a variety of reasons why when you do a build a version number turns out the way it does.

I don't know what you are digging at. But I can tell you -- I can state as fact -- and I just did -- that the

only --

MR. MILLER: Your Honor --

DR. COOMER: -- between those two builds is this change that we submitted.

THE COURT: All right.

MR. BROWN: So there is not a version 31?

(Unintelligible cross-talk)

MR. MILLER: Your Honor, we just reraise the same objection. Dr. Coomer is here voluntarily right now. Dominion is not a party to this. He is trying to be helpful to the Court. And we are going down a path of cross-examination again.

MR. CROSS: Why are they scared to answer questions?

THE COURT: All right. No more commentary, let me just say. My understanding --

DR. COOMER: I'm not scared to answer your questions.

THE COURT: All right.

MR. CROSS: I wasn't talking to you, Dr. Coomer.

THE COURT: My understanding just from what Dr. Coomer said was very -- there were a lot of people speaking -- is that Dr. Coomer said that there was no separate change from the 5.5-A that has been made so that there is -- to the extent the other one had a .30, there was no .31 separate change.

DR. COOMER: That's correct.

THE COURT: Is that correct?

DR. COOMER: That's correct.

THE COURT: All right. Fine. Thank you. Is there anything else?

All right. Doctor, you are welcome to stay as long as you want to stay. But I understood that you had a hard deadline.

DR. COOMER: Yeah. I do have a hard stop, and I do appreciate that.

THE COURT: All right. Thank you very much.

MR. CROSS: Thank you, Dr. Coomer.

THE COURT: Is it Mr. Barnes who is giving directions to people in the field about the L&A testing at this point?

MR. RUSSO: I think Mr. Barnes would be the best person to try to answer your questions. He is involved with the development of logic and accuracy testing.

THE COURT: All right. Is he --

MR. RUSSO: We're going to -- if you can give us one minute here to get in touch with him.

THE COURT: That is fine.

(There was a brief pause in the proceedings.)

THE COURT: Good afternoon, again, or good morning. Morning, Mr. Barnes, also.

I just -- we were discussing the circumstances around the software being distributed and subject to logic and

accuracy testing again. And I wanted to find out whether there were -- to your knowledge, whether there were any additional instructions about conducting logic and accuracy testing that was given to any -- all or any of the counties relative to the software.

MR. BARNES: The one additional instruction was for the counties to verify the new hash signature for the new version number of the ICX application.

THE COURT: And therefore am I to assume that there were no -- there was no other modification and in particular there was no expansion as to the number of the ICX machines that were going to be tested for purposes of looking at that race in particular or any other races?

MR. BARNES: Again, we did not give them another list of instructions to follow for their L&A testing. Part of their normal L&A testing is to check every vote position on every ballot as they go through the ballot style. And that is how the occurrence was found with the old version. So we were just going to have counties follow the same protocols with the new version.

THE COURT: Mr. Harvey had confirmed before though that the instructions were that you would run the ballot -- let's say -- let's -- just consider that there were ten machines, let's say, that were being tested. That you would run race Number 1, which would presumably be the presidential

race, on Number 1 machine. Then you would run race Number 2 in priority on machine Number 2. And when you had finished the ten, then you would go back -- the 11th race would be tested again -- would be tested on the machine Number 1 again.

Is that something different than you know of?

MR. BARNES: No. What my understanding of the L&A procedure is is the ballot is loaded on to the L&A -- on to the test screen ballot. And then the first race of the ballot is displayed. And then on that race, they will mark each -- they will touch the first candidate, validate that the mark is there; proceed to the next race on the ballot; mark the candidate, make sure it is there; and proceed all the way through the ballot until they arrive to the summary screen. And they validate that they see those selections on the summary screen.

They then backtrack. Go back to the first race in the ballot, remove the mark from the first candidate, and then mark the second candidate in that race and proceed through the ballot again all the way through the summary screen.

And this is done to make sure that every vote position is responsive and that the system shows that summary selection at the end. They will produce one printed ballot through that exercise with at least one of those candidates per contest marked. But they won't produce a ballot for every instance, for every candidate in every race on every machine.

They will just produce one printed ballot at the end of that test of that particular BMD.

THE COURT: And have you looked at the instructions that were given in January via Mr. Harvey's office?

MR. BARNES: Yes, ma'am.

THE COURT: And that is what you think is consistent with what -- what you have described is consistent with the protocol described?

MR. BARNES: Yes, ma'am.

THE COURT: Well, let me walk through it again. Because that certainly was not my understanding from the testimony provided or from the observations that were provided by people at the -- observers at the polling.

So I'm not -- so you are saying basically the member of the staff who was testing it will go in and vote on the presidential race? And just walk me through it again so I can stop you now that I have heard the whole -- what you think is supposed to happen.

MR. BARNES: Okay. So we'll take it as a single race, single -- single ballot, single race. And we will say the presidential race, which has four candidate options.

On the testing, they would load the ballot, bring up the contest that shows the four -- the four contestants. They will mark the first contestant and then leave that screen and go to the summary screen to validate that that mark is showing.

They would then go back to the race itself, remove the mark, and then put a mark for the second candidate and then proceed back to the summary screen, confirm that that is showing. Go back again to the ballot, remove the mark, mark the third candidate in the race, proceed to the summary screen, confirm that is showing. And then go back to the race, remove the mark of the third candidate, put a mark for the fourth candidate, which is the write-in, type in some form of a name, proceed to the summary screen, verify again that that is showing.

Then they would backtrack, go back to the race itself, remove the mark, go to the summary screen, verify that that mark again is not showing. Then go back to the race. And now they are going to put a mark on the ballot so that they can produce a printed ballot from the machine.

And they may select the first candidate or second candidate or third candidate depending on what they are needing to produce for their test deck. So they may do the first candidate and then proceed back to the summary screen and then print the ballot.

THE COURT: So is the printed ballot the one with all of the choices?

MR. BARNES: The printed ballot will only have the one selection made at that last operation. The ballot can only have one mark for the race.

THE COURT: I don't -- because I don't know whether -- is anyone with you from -- are you able to receive an email if I send counsel the L&A procedure -- January procedure and they sent it to you at this point?

MR. BARNES: Yes, ma'am. I have access to email.

THE COURT: I don't want to be the person directly sending it to you. But -- all right. But if counsel doesn't have it directly offhand, Ms. Cole can send it to one of you right away so you can send it on.

Send it both to Mr. Miller and Mr. Russo.

LAW CLERK COLE: Okay. I can also send it to Harry, and he can share it on the screen.

THE COURT: Okay. Why don't we do both? Why don't we send it because it is harder for -- let's do both and give Mr. Barnes an opportunity to look at it. All right?

(There was a brief pause in the proceedings.)

MR. BARNES: I haven't received anything as of yet.

LAW CLERK COLE: Mr. Martin has it now if you want him to share his screen.

THE COURT: I want Mr. Barnes to be able to review it without having to see it on the screen first.

MR. RUSSO: My email might be running a little slow. So I emailed it. So it is just a matter of --

THE COURT: That is fine.

Ms. Cole, can you pull up Mr. Harvey's affidavit

also?

LAW CLERK COLE: Yes.

MR. RUSSO: Do you know what docket number that is?

THE COURT: Well, the affidavit?

MR. RUSSO: Yes, ma'am.

LAW CLERK COLE: My recollection is it is 834-3.

MR. RUSSO: Thank you. I was just trying to look through the transcript for that explanation. I was not finding it. I appreciate that.

MR. CROSS: Do you mind forwarding that document that Ms. Cole sent you so that I can pull it up too?

MR. RUSSO: Yes.

MR. CROSS: Thank you.

THE COURT: Does everyone have the procedure?

Mr. Barnes, you don't have it still?

MR. BARNES: No, Your Honor, I do not.

THE COURT: Mr. Russo, did you send it?

MR. RUSSO: I did. Let me try again.

THE COURT: Okay. Very good.

MR. MILLER: I think we both actually sent it.

THE COURT: All right.

(There was a brief pause in the proceedings.)

THE COURT: All right. Mr. Barnes, did you get it yet?

MR. BARNES: Yes, Your Honor. I just received it.

THE COURT: Very good. Let me give you an opportunity -- I'll give you the opportunity to read the portion that deals with the process for looking -- testing the polling place scanner, that one -- I'm sorry -- right above it, testing the BMD and printer.

And have you had an opportunity to look at that, that Section D?

MR. BARNES: Yes, ma'am. I'm reviewing that.

(There was a brief pause in the proceedings.)

MR. BARNES: Your Honor, I've read it.

THE COURT: Thank you very much. So my understanding both from Mr. Harvey's testimony on this particular procedure and what the witnesses to the L&A testing observed when they were able to observe this in a -- because it was public was that the description provided in the text under -- in connection with the word example was what was occurring, that there was not -- every race was not in a particular ballot -- ballot machine -- every race that was listed on the ballot was not, in fact, tested on that one machine. That, in fact, it was -- you went from machine to machine as described under the word example.

MR. BARNES: My -- excuse me.

THE COURT: Yes. Go ahead.

MR. BARNES: My reading of the document outlines that the ballot style will be displayed on, we'll say, machine one

and that the process of creating the ballot that is going to be used for the test deck for machine one would be that the -- that the operator would select the first candidate not for just one race but the first candidate in every race on that ballot, proceed through the whole ballot, and then at the end would then print that one ballot that had the first candidate selected.

So that the machine one would have ballot style one and then it would have the selection of the first candidate in every race selected and print it.

On the second machine, the ballot would be loaded. And then from that machine, the ballot that would be printed for the test deck would be the second candidate in each race. And then that ballot would be printed for the test deck.

And then they would go to machine three, load the ballot. And on this one, the ballot that would be produced for the test deck would be the third candidate in each race within that ballot and so forth and so on.

THE COURT: Well, that certainly is somewhat different than my understanding the testimony and evidence. And -- but I understand what you are saying.

What is the -- so just to summarize again is that you understood that if I -- whoever was Number 3 in each race would have been picked -- if you were on the third machine, you would have picked Number 3 -- the candidate in the third position for

every single race?

MR. BARNES: Yes, Your Honor.

THE COURT: And what if there wasn't a candidate?

MR. BARNES: If there is not a third -- if one race has four candidates but the second race only has two candidates, then you do not make a selection at all. You would skip. There is not a third option to choose. So you would leave that race blank.

THE COURT: Then you would continue down the ballot?

MR. BARNES: Yes, Your Honor.

THE COURT: I think this is sufficiently a material change in the way that perhaps it has been presented. I'm not saying anything -- that you are wrong in any way or -- but I just think that I would like to make sure there is nothing that the plaintiffs want to ask in light of that testimony.

And have you observed this yourself or not?

MR. BARNES: I have not been in the field to observe the L&A testing with the new system, Your Honor.

THE COURT: All right. So you haven't been in the field to observe their application of this procedure?

MR. BARNES: That's correct.

THE COURT: All right.

MR. RUSSO: Your Honor, I pulled up Mr. Harvey's declaration, and I'm looking at that. And he seems to indicate that all -- that testing the ballots -- a test deck where you

use every permutation would be overly burdensome and unnecessary, as the Coalition plaintiffs urge, in other words, to generate test ballots so that all candidates in all races within the unique style have received a single vote.

I think maybe that is where some confusion is coming into play. And I think Mr. Harvey was under the impression -- and his declaration seems clear to me. But to the extent there is some confusion that maybe you thought every permutation on the ballot maybe had to run a test deck with every combination, is that -- and I'm just maybe trying to understand it also myself -- where the disconnect is here, frankly.

THE COURT: Mr. Skoglund was, I think, the Coalition's witness or -- is that right? Or was he Mr. Cross' witness?

MR. CROSS: Mr. Skoglund was a witness for the Coalition.

THE COURT: Okay.

MR. BROWN: I'm sorry, Your Honor.

THE COURT: So I'm assuming that you spent some more time -- particular time on this, Mr. Brown.

So are there any -- anything you want to point out or ask Mr. Barnes about?

MR. BROWN: Thank you, Your Honor. My question would be, sort of to cut to the chase -- and that is: On the logic and accuracy testing as described by Mr. Barnes, all of the way

through tabulation, there is only one ballot that is actually tested and that the other testing that Mr. Barnes described was testing the accuracy of the summary screen rather than the accuracy of the final output.

Is that correct, Mr. Barnes?

MR. BARNES: What I was describing was the generation of the test deck that has to be generated at the end of the L&A testing.

THE COURT: Wait a second. I think we should put ourselves on -- everyone but you on mute so that we make sure that we --

Go ahead.

MR. BARNES: Again, what I was describing was the generation of -- it is two parts. It is the L&A test to validate display of ballot operation of the touchscreen being receptive to touch and then the generation of the record from each device that is used to organize the test deck that is then scanned by the scanner.

So the tester wants to go through and look at each race on the ballot, make sure that all the candidates are displayed, make sure that all candidates are receptive to touch, and take that all the way to the end of the summary screen. And then they back out and continue that through all positions.

But when they have completed that, they have to

produce a record. But they are only required to produce one printed record from that BMD. And then they accomplish to get all positions voted and a vote registered by doing the machine one, the machine two, the machine three through the ballot style.

MR. BROWN: Thanks.

MR. CROSS: Your Honor, could I ask a follow-up question?

Mr. Barnes, did I understand you right so if you've got -- well, let's just take a concrete example. There is a Senate race this year that has, as we understand it, it sounds like 20 or so candidates.

So that means you would generate a test ballot that has -- you would generate a separate test ballot for each of those candidates on however many machines correspond. Right?

So let's say there are 20 candidates. You would generate 20 separate test ballots on 20 consecutive machines selecting each candidate in turn.

Do I have that right?

MR. BARNES: What you would do -- let's say that there are -- let's say that there are 20 machines. We'll make a balanced number. Let's say -- actually we'll say there are 10 machines and there's 20 candidates.

Then you will start with machine one, check all the races, check all of the candidates, make sure they are

responsive. But when you are done with that machine, at the end of that machine, you would select the first candidate in that Senate race and produce a ballot printout.

Then you would go to the second machine. The second machine, again, you would check the full race, check all positions, check responses. But when you are done with that, you would produce one ballot from the second machine and that would have the second candidate.

And you would repeat that process through those ten machines. When you got to the 11th candidate, you would be returning back to machine Number 1. And on machine Number 1, you would now select -- again, you have already looked at all of the candidates again already. So on that machine, you are going to produce a second ballot. And that second ballot is going to have the 11th candidate selected.

And then you will continue to proceed in that manner until you have produced a record that -- a vote record that has every candidate in that race voted one time.

MR. CROSS: And if you have got -- if the other elections have fewer candidates -- right? So let's say you are at candidate 6 out of the 20 and all of the other races have fewer than 6 candidates, at that point forward, you would not have any candidates selected on those races for the test ballots?

MR. BARNES: That's correct.

MR. CROSS: So that would mean if we have got a race this year of, say, 20 or so candidates, you would have a pretty large number of test ballots coming out of machines that have no candidate selected for some of those races?

MR. BARNES: That would be correct.

MR. CROSS: Thank you.

THE COURT: Just state that again, what you were saying, Mr. Cross.

MR. CROSS: Because this year we've got a Senate race that has a large number of candidates -- it sounds like 20 or more -- and because once you get over -- say the next highest number of votes is -- I'm trying to think of the easiest way to say what I just said.

Once you get over the next highest number of -- say every other race had two -- only two selections. Right? Once you get to the race that has three or more candidates, you stop selecting any candidates in all of those other races. You don't go back and just select one that you have already selected.

So that means once you get to 3, 4, 5, 6, on up through 20-something candidates when you are testing it, all the other races on the ballot would have no selections on any of those test ballots for all of those machines. So you would be going machine to machine to machine.

THE COURT: You are only going by position number. I

see.

MR. CROSS: So with this particular year with a race with that many selections -- you are talking a pretty large number of BMDs that would have test ballots with only a single candidate selected, which then gets printed and tabulated. Those BMDs would not have test ballots for candidates for all but one race.

MR. RUSSO: I mean, there's always going to be elections where you only have maybe one person in a race. So, Mr. Barnes, that is what you would do, for example, if you had a county commission race also on the ballot and you've got one person in that race. Right. You would put that -- you could check that person off the first -- on the first test ballot. But going forward -- I mean, there is going to be other contested races, of course. You know, maybe you have a house race, a state house race with three candidates. So you have got to go through those three times. But the county commission race with only one candidate would only have -- be selected the first time through.

MR. BARNES: Correct. Correct. And if --

MR. RUSSO: We have had this happen in every election.

THE COURT: Well, I'm not sure that really helps because, of course, when you have only a single -- a single individual then they are in position one. So they are going to

be tested -- those races are all going to be counted as position one.

The problem here we have is position -- the fact that there might not be any others races that have Position 10 and so -- or Position 8. So that basically in the very race that sort of seemed to have -- on the ballot that had created a quirk, you are going to have the least amount of L&A testing -- that's all -- in terms of output.

MR. CROSS: Well, yeah. I'm not sure that is quite right, Your Honor. Let me back up.

They will test every candidate in that Senate race. So that particular race that has a large number of candidates -- right? -- that will get tested.

What it means is that for all of those ballots beyond, say, the first three or four candidates, depending on what else you have there, there will be no L&A testing for any of those other races.

THE COURT: Right.

MR. RUSSO: Well, they are tested the first time. I mean, I think we are saying the same thing.

MR. CROSS: No. No, they are not. What Mr. Barnes is saying is there is no ballot that will be printed at all from those BMDs that gets printed and scanned and tabulated that has any candidate selected from any race other than the Senate race once you get beyond the max number of candidates in

those other races.

And given a lot of those races are only going to have maybe 2 or 3 candidates but we have got a race with 20 or more, you are talking about maybe 50 to 20 machines each time that are not having a single candidate tested to get printed and scanned and tabulated.

MR. RUSSO: I understand what you are saying. But you would have had -- that person who is -- you know, if it is a race of three people, you would have had a test ballot that would have had that person -- the third ballot would have been, you know, in this example that you gave a race of three people.

Now, when you get to person four -- Mr. Barnes can explain it. And if I'm wrong, I'm wrong. Mr. -- I'll let Mr. Barnes explain it.

MR. CROSS: Because once you get to selection -- again, Mr. Barnes, I thought I -- let me just try my question again. I thought we had it straight.

Let's say the maximum number of candidates on a ballot was 4. That is the most you have in any race is 4, except for you have got the Senate race, let's say, that has 20 candidates.

Are you with me?

MR. BARNES: Yes.

MR. CROSS: Once you get to selection five to test that, meaning printing a ballot and scanning it, in the Senate

race, you are going to do that and that ballot is not going to have any other candidate selected for the test ballot; right?

MR. BARNES: On that ballot style. But when there are multiple ballot styles within the polling location, once you complete ballot style one, you then have to do the same thing for the next unique ballot style within that -- within that polling location. So there is opportunity for more ballots to be generated with more selections.

MR. CROSS: Right. But most -- particularly on election day -- putting aside early voting, on election day, most of your ballots -- most of your polls are going to have a single ballot style; right? Otherwise, you are talking about a polling site that has multiple precincts.

MR. BARNES: There is -- every precinct in the state is different. Some only have one ballot style. Some have many. It is a potpourri out there.

MR. CROSS: But with my example, you would have -- unless you are printing multiple ballot styles on that BMD, you are going to have selections -- you are going to have machines five through -- you are going to have 15 machines -- remaining 5 to 20, you are going to have 15 machines for which your test ballot has only a single selected candidate just in that Senate race; right?

MR. BARNES: The ballot that is printed for the test deck, yes. But every position would have been looked at on

that ballot during the examination.

MR. CROSS: On the screen?

MR. BARNES: Correct.

MR. CROSS: And looking at the screen does not tell you what actually gets tabulated; right?

MR. BARNES: The screen is the interaction and the intent of the voter. The ballot is what will be the official record.

MR. CROSS: Right. So --

THE COURT: And the next step is, of course, the scanner tabulator?

MR. BARNES: Correct.

THE COURT: And you can't really test that just from looking at the screen?

MR. BARNES: Again, that is why we produce the record from the machine so that the scanner can also be used to validate that what is coming from the system is what the scanner then tabulates.

THE COURT: I think that the -- I mean, I'm not sure that what is happening in the field is what you are describing. But, you know, I'm just -- based on what the evidence is and the way that Mr. Harvey described it but -- and why he thought everything else was too burdensome.

But that is -- you know, I understand what you are saying at this juncture. I mean, I'm looking at my -- at a

sample ballot here. And -- and basically when we get down to number -- where we were actually thinking of four candidates, we get down to the fifth one, only one of the major leaders here who is in that first top four is Doug Collins.

So all the testing that would relate to other -- identified at least by the polls leaders in this race are after Number 4. So testing of their -- any ballot, including them, would be -- it would be fewer. But that is if it is, in fact, the way it is indicated.

I'm just looking at Paragraph 6 of Mr. Harvey's affidavit and also testimony. And I can't really know at this point that what Mr. Barnes describes based on the testimony and the evidence presented is exactly what is happening.

But, Mr. Skoglund, did you get an opportunity to be present during any of the L&A testing? Remind me.

MR. SKOGLUND: No, Your Honor, I have not been present for any of it.

Can I offer a thought about this?

THE COURT: Yes.

MR. SKOGLUND: So I think that, as I testified before, you know, logic and accuracy testing depends on what questions you are asking. Right? And the quality of the question you ask depends on the quality of the test. So it really makes sense to think about what questions you are asking, what are you trying to find out.

And I think, you know, this is -- this is more logic and accuracy testing that some jurisdictions do. But I think that is not the standard. I think the question is: Does it meet Georgia statute, which I think is quite good and quite strong? I would go further, if it were me.

I think that the way I would do -- conduct a logic and accuracy test and the way I have seen other people do it is you create a spreadsheet essentially ahead of time with the test pattern for votes for what you plan to do. And in that, you try overvotes and undervotes and races where you vote for two and the audio ballot and trying it in Spanish language. And, you know, you try a variety of scenarios.

And then, you know, knowing that you have good coverage in that spreadsheet, then you go to the machine and ask each machine to accomplish that set of tests. That is closer to what I think the Georgia statute requires.

THE COURT: Well, I just would like to know what is actually going to be -- and whether everyone is going to be doing something different actually. That is my concern at this juncture but -- based on the evidence introduced.

But the other thing was simply because this was the -- the alleged tweak that involving this particular ballot one would really want to know it was -- all permutations of that.

It is hard for me to know without -- what I do know is what -- the issue that Mr. Cross elicited. And it might

behoove the State to consider whether to modify at least this in a way -- whatever the process is, if it is, in fact, like what Mr. Barnes describes as opposed to the inference that was given from the procedure as I identified and witnessed by others who were watching the L&A testing in the last election, it really behooves everyone to think about is there something you want to beef up under the circumstances since you have a software change particularly affecting that race.

I can't really say more at this juncture. I'm going to go back and look. But there's really some material differences between the way Mr. Barnes described it and the way it was otherwise described.

MR. MILLER: Your Honor, I don't have the transcript in front of me from the hearing, so I can't speak exactly of Mr. Harvey's testimony.

But as far as the declaration and as I recall the hearing, I think the concept was the concept that Mr. Barnes described of the difference between printed ballots versus the test on the screen. And so I don't think there is --

(Unintelligible cross-talk)

MR. MILLER: -- necessarily inconsistence there but different topics.

THE COURT: Yeah. I mean, there is no question that it was supposed to be getting at the difference as to whether there was a difference between the way it tabulated and the way

it printed and the ballot.

But it was -- but it was much more helter-skelter because -- as opposed to just testing one office per machine and sometimes more depending on how large the ballot was. So that -- I mean, that is exactly what -- not just through Mr. Harvey's testimony but through the affidavit of people who were witnessing it.

So, Mr. Harvey, are you -- is Mr. Harvey in charge of giving you instructions or -- I gather? Are his folks out in the field at all, or is it -- I'm not -- or is it your folks who are doing the L&A testing? I mean Mr. Barnes.

I mean, it is somebody from the county. But who is the technical adviser, if there is anyone?

MR. BARNES: Logic and accuracy testing is a county responsibility. So it is in the hands of the county.

THE COURT: And do they -- are they relying then on that 2000 -- January 2020 procedures manual in determining how to proceed?

MR. BARNES: To my understanding, yes, Your Honor.

THE COURT: And this is not something that you have given directions to anyone about in the field, I gather?

MR. BARNES: That would be correct.

THE COURT: And do you have any idea whatsoever why there was an impression that it was a database that is going to be distributed rather than software in the communication?

MR. BARNES: Your Honor, I do not know why they chose the word database for distribution. It was always that application install -- an application upgrade installation.

MR. MILLER: Your Honor, I believe we can speak to a little bit of clarity on that in that the form that you saw attached to the email that, I believe, Mr. Brown filed is a standard form that is used when databases are delivered to say, here is the schedule, here is where we're coming through.

And so that form didn't change because it was the same type of run. So it is the same type of thing that the counties are used to doing and that the investigators and liaisons sent out. And, you know, frankly, I think it may have been a bit of a misunderstanding amongst the county liaisons who were the direct contact as to what was being delivered but they knew something was being delivered on this schedule.

THE COURT: I would like to just take a short break so I can talk to Ms. Cole privately, and then -- then we'll resume.

MR. RUSSO: Your Honor, could we let Mr. Barnes go or --

THE COURT: Let him stay for just a minute. I won't keep him much more. Thank you.

(A brief break was taken at 11:00 A.M.)

THE COURT: Mr. Brown, Mr. Miller? Let me just say to counsel -- and I realize this is not Mr. Barnes' direct

responsibility. But he also described the process as he envisioned it at least and testified. So that has some value.

At the very least -- and I would say perhaps more than that -- the procedure that was identified on the January memo is susceptible to a very different interpretation or multiple interpretations.

And given the importance of the software -- the L&A testing, I can't tell you that you are mandated, but I think you would be really behooved -- it would strongly behoove the State in the interest of everyone involved here that there be clarification of what the process is.

You are using -- even though it has been identified as a de minimis change, even if it hadn't been a change, it would have been important for there to be -- in this first use statewide in a major election to have this strong L&A testing.

And even if it is construed the way Mr. Barnes says with the effect of it after you get to position four you are going to have fewer tests, you will still have a lot of tests. But, you know, it would have been -- it would be a better thing to have a different process for dealing with this wrinkle.

But even so, I don't think that -- from what the evidence was in the record that it is -- that the L&A testing is being pursued in the way that -- the more pristine manner described by Mr. Barnes. And maybe it is in some places, but in many places it is not.

So, you know, to the extent that, you know, it is still in process, which it definitely is -- it is just beginning -- I would really encourage the State to think about providing clearer directions, you know, thinking about having -- not just relying on a written one but having some sort of video conference to discuss it. And maybe you-all feel like it is not necessary and that is -- but I think the evidence might point to the contrary and --

MR. MILLER: Your Honor, I would want to say that, you know, the memorandum that Mr. Barnes drafted that was distributed by the elections director, that is not in a vacuum. They conduct monthly webinars. They send various instructions through Firefly. And those kind of things just haven't come into evidence in this case because it, frankly, wasn't at that point as much of a disputed issue.

We, frankly, thought we were talking about malware on ballot-marking devices. But suffice it to say, Your Honor, that there is a significant amount of additional kind of guidance and instructive material to the county superintendents throughout the election process through webinars and things of that nature.

THE COURT: Well --

MR. MILLER: And it touches on this and other issues. And, again, I could go into things that, frankly, are definitely not an issue in this case as to candidate

qualification challenges, things of that nature.

THE COURT: I think that this case deals with a variety of things that relate to the machine translating the vote cast by the citizen that walks into the booth or cast in a different way. So I'm just -- that is -- I'm just making these comments.

I encourage you because of the way the evidence came in and what it shows. I'm not saying -- I'm not in any way obviously in a position to say that you -- Mr. Miller, that the individual messages haven't gone out.

But the -- I still have the testimony in front of me. I have the January procedures, which are the official procedures from the Secretary of State about doing this -- preparing for an election that were in front of me. And then I have voters as well as others who were on the board -- on the boards' affidavits. So that is what I'm relying on in just mentioning it to you. But, you know --

MR. MILLER: I understand, Your Honor. I'm not trying to add additional evidence now.

THE COURT: I'm talking about the long run here. My interest is not -- you know, even though it is described as I'm interfering, my interest is in seeing that the voting system works and the voters' votes are counted and that there are no screwups on elections that end up having you back in court. That is -- and to deal with the case in front of me and to deal

with it in an honest and straightforward way.

And I wouldn't be having this conference otherwise so I can really understand what is going on. And --

MR. MILLER: We understand.

THE COURT: So this is a change. So that is what I'm dealing with.

I still would -- as soon as you do have the -- whatever the submission is from Pro V&V, I would like it to be submitted on the record so that we have it. And the same thing -- and what the submission is to the EAC.

And if there is any further clarification that is provided on L&A testing, I would like to be notified of that. Because right now I have -- I mean, this is exactly what I'm dealing with. I have to issue an order, and I don't want my order to be inaccurate in any respect factually.

You may contest the conclusions. But I don't want it to be inaccurate. And we have all worked really long enough to know that is a concern always.

All right. Now --

MR. MILLER: Yes, Your Honor. I apologize. And I do just to -- as we started off today, I do just want to reiterate that we are appreciative of that and your attention to this. And, frankly, the Secretary has the same goal of ensuring that the election can go forward in the most efficient and effective manner.

And, Your Honor, we are appreciative and will remain responsive to the Court's requests. But it is truly a -- you know, we are at crunch time. And our local election officials are trying to administer elections while they are performing inspections for the Coalition plaintiffs. Our State election officials are trying to help out. And in practical realities -- and I understand the Court did not intend -- and we did not intend to have a negative tone towards the Court.

THE COURT: All right. We'll look at -- when Ms. Welch gets her transcript out, I'll determine if there are any -- what portions of the video could be made available on the public docket.

I don't want to get myself in another problem with not having a hearing being in public that should be. And that's really again -- and there might be nothing here that is confidential.

But you are welcome to send me, just having participated in this, any of your position about this and about what portion should be in the public or if all of it can be in the public.

If you are going to do that, just simply so I can proceed on a timely basis, I would appreciate your letting me know -- let's see. It is 11:00 today. If you could let us know by 4:00.

MR. RUSSO: Your Honor, are we going to get a copy --

how do we go about doing that? Do we get a copy of the video?

I mean, I do think probably Dr. Coomer's testimony is something that may not need to be public. However, I just want to make sure we understand the process here. We review the video and send something to you or just --

THE COURT: Well, I think at this point I'm not sure we're going to be able to -- I have to find out from IT. If we have the video, we'll give it to you. And if not, you're going to have to just simply go by your recollection -- your joint recollection --

MR. RUSSO: Okay.

THE COURT: -- of counsel there.

MR. RUSSO: You say by 4:00 today?

THE COURT: By 4:00. But I'll let you -- we'll let you know right away whether we can get you a video.

MR. RUSSO: Okay. I didn't know how that -- I have never had a recording.

THE COURT: It is either yes or no that we can do it. All right.

MR. CROSS: Your Honor, could I ask just -- because it is something that may be breaking, we have heard a lot of new information today. Could we just have Dr. Halderman just briefly respond to a couple of points? Because it sounds like this is stuff you are considering for Your Honor's order.

THE COURT: All right. But I would like to release

Mr. Barnes so that he can go back to work, unless you have an objection.

MR. CROSS: No.

MR. BROWN: No objection.

THE COURT: All right. Mr. Barnes, you are -- you can go on with life.

MR. BARNES: Thank you, Your Honor.

THE COURT: All right. Thank you very much.

Go ahead.

MR. MILLER: Your Honor, before Dr. Halderman begins, because I don't want to interrupt, we just do want to state our objection on the record to the continued expansion of the evidence at issue.

THE COURT: Well, I think that to the extent that he has something useful that helps me understand what has been said, I think the plaintiffs have an opportunity to --

MR. RUSSO: It may be -- you know, to the extent that Dr. Coomer needs to listen to this -- and I don't know --

THE COURT: You can show -- you are welcome to try to reach Dr. Coomer. But it seemed like he had a conflict.

MR. RUSSO: I guess I could show him the video maybe.

THE COURT: Or you could get Ms. Welch --

MR. RUSSO: And he could respond to any --

THE COURT: You could see if you could get her to give you just his portion of the testimony.

MR. RUSSO: Okay. I just want to make sure we get to respond since there was a disputed issue earlier between the two.

THE COURT: Ms. Welch, are you able just to -- just produce Mr. Halderman's -- we don't know how long it is. But let's say it is 20 minutes. Are you able to do that -- turn that around fairly quickly?

COURT REPORTER: I can turn it all around very quickly, Judge. Whatever they ask of me, I do.

(There was a brief pause in the proceedings.)

THE COURT: All right. We'll get it to you one way or the other. Very good.

Can we unmute Dr. Halderman?

DR. HALDERMAN: Hello. Can you hear me, Your Honor?

THE COURT: Yes.

Mr. Cross, did you want to structure this and give him some questions?

MR. CROSS: Yeah. I mean, I think he's been listening.

Probably the easiest way is: Dr. Halderman, it sounds like there are a few points that you had to respond to. Go ahead.

DR. HALDERMAN: Yes, of course. And however I can be helpful to the Court in this manner.

First, just to respond to the point that Dr. Coomer

made about my suggestion in my most recent affidavit that procedural remedies could cure this problem, I think his response seems to indicate that the problem that we're attempting to or the State is attempting to fix here is a complex one, that it is possible to reproduce it but reproducing it reliably, he testified, requires operating with a simpler version of the ballot.

And that just gives me further concern about whether the software fix can be adequately tested given the time that is available.

Now, beyond that, I would like to reiterate the substance of the security concerns that I have. We have to be clear that even if the change to the source code is a small one, as Dominion says it is, the process of updating this software requires replacing completely the core of the Dominion software on every BMD.

We know that because the update instructions are to uninstall the APK, that is, the package that contains almost all of the Dominion software that runs on the ballot-marking device, and install a new APK, a new copy of all of that software.

So this is, frankly, quite alarming from a security perspective. Replacing the BMD software at this juncture so close to the election is an ideal opportunity for attackers who might want to infiltrate the machines.

If attackers have gained access to Dominion's systems, to Pro V&V's systems, to the CES systems, or to the county systems that are going to be creating and distributing this software change, that would be an opportunity for the attackers to subvert the software that runs on election day. And, frankly, none of the procedures I have heard described here today would be adequate to stop that.

So beyond the security questions, the change at this point seriously concerns me from an accuracy and correctness standpoint. As I said, the software change is fixing a problem that is complex to reproduce. It is difficult to test to ensure that the fix actually does correct that problem and that -- and it is virtually impossible at this last minute to thoroughly test that it doesn't create new problems.

So quite often last-minute changes to complex systems do create other unknown consequences. And while the previous version of the BMD software at least had been tested through use in elections, as Dr. Coomer testified millions of voters in aggregate, this new software has only existed for a matter of days.

I myself personally have spent more time testing the old version of the software than anyone has spent testing the new version of the software because it has only existed for such a short time.

Pro V&V hasn't even had an opportunity to write up

its findings. Those finding have not been reviewed by EAC, which has introduced this de minimis testing categorization for emergency fixes in small -- that are small in nature. But the State isn't even following that -- that special case process that has been put in place by EAC. It seems that that process itself is being circumvented. It just seems quite extreme in -- under these circumstances to forgo even that level of compliance.

I wanted to just briefly address the L&A procedures that we heard described. I think two key points about that are that the L&A testing we have heard about would be trivial for malware to detect and bypass. It has a very clear signature that the BMD can see, that ballots are being printed, that are being marked in the same position across every race.

It would be absolutely simple if you were programming malware for the BMDs to have it avoid cheating on ballots that are marked in the same position across each race.

So the security value of this L&A testing is minimal. And we have also heard -- and I think this point came out clearly for the first time today -- that the L&A testing isn't even checking to make sure that each BMD correctly produces a ballot for each -- for the entire set of candidates in every race.

You don't have to test necessarily every permutation of candidates in order to check that. But the least that I

would expect from an L&A procedure would be that it checks that each BMD can correctly mark a ballot for each candidate.

And as we have heard today, because of the length of the Senate race, many BMDs apparently will not even be tested to make sure that they can print a ballot that is marked for each candidate in the presidential race. And that concerns me because a particular BMD might have a corrupted somehow copy of the database -- of the programming that goes into it.

And the L&A procedures, as described, because they don't involve printing a ballot from each BMD that has been marked for every candidate, wouldn't be able to pick up that problem. You have to actually test that each candidate has been marked and can be tabulated correctly.

THE COURT: Wait a second.

DR. HALDERMAN: Apparently someone is sawing on the outside of my building, and I may have to quickly move to another room.

But I think I have addressed the points that I had in mind. But I'm very happy to answer any questions.

MR. CROSS: Dr. Halderman, just a couple of follow-up questions. And the Court may have questions or Mr. Russo.

In your experience looking at elections over the years, is there any election that comes to mind where a state was replacing the software with new software less than two weeks before the --

DR. HALDERMAN: No, nothing comes to mind. This is -- this is not a typical procedure to be going through. In an emergency, perhaps you would need to. But even then, it would be an extremely risky thing to be doing both from a correctness standpoint and from a security standpoint.

MR. CROSS: And just two final questions. Are there real world examples you have seen where a software change that even had been fully vetted and was intended to fix one discrete problem that that then had unintended consequences that were quite significant?

DR. HALDERMAN: Well, the most significant recent example, of course, is the 737 MAX aircraft where after most of the testing had been completed Boeing introduced what they believed was a relatively small design change to the control system that they didn't believe needed to be rigorously tested because it was the equivalent of de minimis.

But that unfortunately reportedly had fatal consequences and has been tied to crashes that have killed several hundred people. But I think that is an illustration. I think it is a good parallel because both the Georgia election system and the aircraft are examples of complex software systems.

Georgia's election system is millions of lines of source code that are in the Dominion products. And for that reason, small, even seemingly trivial changes can have

consequences that are difficult to understand.

It is just -- it is why we normally in the voting system testing and certification process demand such extended testing for accuracy. That kind of testing can't necessarily rule out security problems. But it does a lot to help ensure that votes are going to be counted correctly in the absence of an attacker.

And it is those processes that are being bypassed here and substituted with apparently less than a week of -- of very rapid-fire testing of some sort. Nothing like the testing that goes into a voting system in the course of a normal software change.

MR. CROSS: Last question, Dr. Halderman. You mentioned that the LAT, the logic and accuracy testing --

(There was a brief pause in the proceedings.)

MR. CROSS: Dr. Halderman, you said that there is a clear signature of testing under this L&A process. For example, the candidates are selected in the same position.

DR. HALDERMAN: Yes.

THE COURT: Does anyone have somebody speaking in the background?

(There was a brief pause in the proceedings.)

MR. CROSS: It seems like it got quieter. Is this better?

Okay. Let me try it again.

Dr. Halderman, the question was: You said that there is a clear signature for the machine to see that it is being tested during the logic and accuracy testing. One example, of course, is all the candidates are in the same position; right? They are all selected in Position 3.

Just to show the Court this is not a hypothetical concern, that the malware can trick the machine during testing, is there a real world example of where that has happened?

DR. HALDERMAN: Of where malware would -- of malware detecting such a thing?

MR. CROSS: Yes. Testing and then --

DR. HALDERMAN: Detecting testing. Well, of course, the prominent example of that is the BMW -- excuse me -- the Volkswagen emissions testing scandal, Dieselgate scandal, where Volkswagen programmed its emission systems to detect -- they were going through EPA testing and emit less pollutants under those circumstances.

So the parallel here is detect that the ballot has been marked in the same position across all races and in that case don't cheat; otherwise, cheat with some probability. That would be -- for malware running on a BMD, that would be absolutely a simple thing to program.

MR. CROSS: Thank you, Your Honor.

THE COURT: Let me just make sure I understand from your perspective what this meant in terms of the testing

that -- in terms of the printing of ballots. Any time -- any ballots -- let's say that there were -- because we were using the example previously of four, that there would not be ballots printed with -- that would reflect any other ballot choices as you -- as they -- for any of the -- any of the times where people had cast ballots for candidates five and onward.

DR. HALDERMAN: Yes, Your Honor. My understanding of the testimony we heard today is that one BMD would be used to print a ballot marked in the first position across every race, another the second position, another the third position, et cetera and that races that had fewer than that number of positions the race would just be left blank on the BMD that was being tested.

So each BMD produces one printout that is marked in one equivalent position across every race. And that, of course, has the problem that for a given BMD most of the possible positions that could be marked are not going to be exercised all the way through being printed and being tabulated.

So if a particular BMD has a database that is somehow corrupted and programmed differently from the other BMDs under testing, the problem would not be discovered.

THE COURT: All right. Anything else, Counsel?

MR. CROSS: Not for us, Your Honor. This is David Cross. If they want to ask questions, they are welcome to.

MR. RUSSO: Your Honor, I don't think we have any questions.

THE COURT: All right. Well, thank you-all very much.

MR. CROSS: Your Honor, I'm sorry. There was one final thing that we wanted to clear up if we could. Mr. Brown sent an email in this morning. I don't know if you saw it.

THE COURT: No, I did not.

MR. CROSS: We're just trying to confirm -- Mr. Tyson sent in an email indicating that there was a message that went out from Mr. Harvey clarifying that there were no new databases coming out as opposed to a software change. He indicated that message went to the counties on Tuesday. The copies that we have -- we have multiple copies from the counties -- indicated it went yesterday around the same time of Mr. Tyson's email.

Vincent or Carey, do you know when that actually went out to the counties?

MR. RUSSO: I mean, I believe that it is -- so we looked at it earlier -- what Bruce sent. Buzz is a webface. It is a web portal. So I think Mr. Harvey posted it on Buzz in accordance with what Mr. Tyson represented. And the email went out the following day due to however Buzz, the program, populates the email that automatically goes out.

MR. CROSS: Okay. Thank you.

That is all, Your Honor. Thank you.

THE COURT: All right. Thank you very much. And we'll be -- we'll be in touch. I mean, I'm trying to get an order out this week. So I appreciate everyone scurrying to get this in front of me.

MR. CROSS: Thank you, Your Honor.

MR. RUSSO: Thank you, Your Honor.

(The proceedings were thereby concluded at 11:32 A.M.)

C E R T I F I C A T E

UNITED STATES OF AMERICA

NORTHERN DISTRICT OF GEORGIA

I, SHANNON R. WELCH, RMR, CRR, Official Court Reporter of the United States District Court, for the Northern District of Georgia, Atlanta Division, do hereby certify that the foregoing 76 pages constitute a true transcript of proceedings had before the said Court, held in the City of Atlanta, Georgia, in the matter therein stated.

In testimony whereof, I hereunto set my hand on this, the 1st day of October, 2020.

Shannon R. Welch

SHANNON R. WELCH, RMR, CRR
OFFICIAL COURT REPORTER
UNITED STATES DISTRICT COURT