

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

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

9
10 **TRANSCRIPT OF HEARING ON PRELIMINARY INJUNCTION VIA ZOOM**
11 **PROCEEDINGS**

12 **BEFORE THE HONORABLE AMY TOTENBERG**

13 **UNITED STATES DISTRICT JUDGE**

14 **SEPTEMBER 10, 2020**

15 **1:00 P.M.**

16 **VOLUME 1**

17 **REDACTED**

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21 ***MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED***

22 ***TRANSCRIPT PRODUCED BY:***

23 ***OFFICIAL COURT REPORTER: SHANNON R. WELCH, RMR, CRR***
24 ***2394 UNITED STATES COURTHOUSE***
25 ***75 TED TURNER DRIVE, SOUTHWEST***
ATLANTA, GEORGIA 30303
(404) 215-1383

A P P E A R A N C E S O F C O U N S E L

**FOR THE PLAINTIFFS DONNA CURLING, DONNA PRICE, JEFFREY
SCHOENBERG:**

DAVID D. CROSS
VERONICA ASCARRUNZ
EILEEN BROGAN
MORRISON & FOERSTER, LLP

HALSEY G. KNAPP, JR.
ADAM M. SPARKS
KREVOLIN & HORST, LLC

**FOR THE PLAINTIFFS COALITION FOR GOOD GOVERNANCE, LAURA DIGGES,
WILLIAM DIGGES, III, AND RICARDO DAVIS:**

BRUCE BROWN
BRUCE P. BROWN LAW

ROBERT ALEXANDER MCGUIRE, III (VIA VIDEO CONFERENCE)
ROBERT MCGUIRE LAW FIRM

FOR THE STATE OF GEORGIA DEFENDANTS:

VINCENT ROBERT RUSSO, JR.
CAREY A. MILLER
ROBBINS ROSS ALLOY BELINFANTE LITTLEFIELD, LLC

BRYAN P. TYSON
BRYAN JACATOUT
DIANE LAROSS
LOREE ANNE PARADISE
TAYLOR ENGLISH DUMA

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FOR THE FULTON COUNTY DEFENDANTS:

CHERYL RINGER
KAYE BURWELL
OFFICE OF THE FULTON COUNTY ATTORNEY

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P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; September 10, 2020.)

COURTROOM DEPUTY CLERK: Okay. Good afternoon, everyone. We are here for the evidentiary hearing in Curling vs. Raffensperger, Civil Action Number 17-CV-2989.

Beginning with Curling plaintiffs, would counsel make your appearance for the record.

COURT REPORTER: You are muted, Mr. Cross.

COURTROOM DEPUTY CLERK: Yeah. It is on his side, too.

(There was a brief pause in the proceedings.)

MR. CROSS: Your Honor, can you hear me now?

THE COURT: Yes, I can. Thank you.

MR. CROSS: Sorry about that. We'll try this again. David Cross on behalf of Curling plaintiffs.

THE COURT: Okay.

COURTROOM DEPUTY CLERK: Anyone else?

MR. KNAPP: Your Honor, Halsey Knapp and Adam Sparks also on behalf of Curling plaintiffs.

COURTROOM DEPUTY CLERK: Thank you, sir.

Coalition?

MR. BROWN: Bruce Brown for the Coalition plaintiffs and Robert McGuire also for the Coalition.

COURTROOM DEPUTY CLERK: Thank you, sir.

State of Georgia?

1 MR. TYSON: Your Honor, Bryan Tyson, Bryan Jacoutot,
2 Loree Anne Paradise, and I believe Diane LaRoss are all here
3 for State defendants from Taylor English.

4 COURTROOM DEPUTY CLERK: Thank you, Mr. Tyson.
5 Fulton County?

6 Okay. We're ready, Judge. Thank you.

7 MS. RINGER: Cheryl Ringer and Kaye Burwell here for
8 Fulton County.

9 THE COURT: Thank you very much.

10 MR. CROSS: Your Honor, I should have introduced two
11 other colleagues who are going to participate, Veronica
12 Ascarrunz and Eileen Brogan. We are spread out in the room.
13 So they won't be on the video. But they are here.

14 THE COURT: All right. Very good. And I guess we
15 have pictures of some other people. But that is fine. That
16 doesn't interfere with anything else. And cartoon images of
17 some people. But that is great.

18 So good afternoon, everybody. Before we really begin
19 this in earnest, I know there was some email exchanges late
20 this morning about timing and schedules. And I tried to just
21 sort of cut to the quick of it by having Ms. Cole write you
22 about, you know, basically pick a number of hours that you are
23 basically thinking you can get your case put in, let's monitor
24 that. Because the defendants never agreed to basically a shock
25 top per witness. And I didn't pursue that further at that

1 juncture because we had a lot on our hands.

2 But having a time frame for each side allows us to at
3 least determine how you are doing and having the totality of
4 the time be counted so that we can get this done in a
5 reasonable way this afternoon and starting tomorrow.

6 First of all, did you agree on a time to begin that
7 will accommodate whatever -- whoever's witness was providing
8 some problems in the morning as to schedule?

9 MR. RUSSO: Mr. Miller can speak to that.

10 MR. MILLER: Morning, Your Honor. I apologize.
11 We're having a little logistical difficulties here with our
12 Zoom technology.

13 THE COURT: All right. So this is Mr. Miller
14 speaking for the record, even though it says Vincent Russo, for
15 Ms. Welch's behalf. So if you-all are jumping sides, maybe
16 each time you converse, say your name for the purposes of the
17 record so we make sure that -- Ms. Welch is handling a lot.
18 All right?

19 MR. MILLER: Yes, Your Honor. We'll -- assuming we
20 can get my laptop working, I'll join separately as well. But I
21 didn't want to delay anything right now.

22 THE COURT: Sure. Thank you.

23 MR. MILLER: Your Honor, I think in terms of
24 schedule, yeah, I think we're largely on the same page. There
25 are a couple of outstanding questions from our perspective on

1 schedule as far as, Number 1, Mr. Liu's testimony, who we
2 understand the plaintiffs intend to call but, to my knowledge,
3 has not been noticed as a witness to the Court and,
4 secondarily, with respect to Dr. Coomer, who the State
5 defendants intend to call and for whom there is no effective
6 subpoena sitting right now for his testimony otherwise.

7 So with that respect, our proposal was -- and some of
8 this depends a little bit on -- and Mr. Cross can speak to this
9 as far as Mr. Liu's availability. But looking at it the way we
10 just kind of framed out, assuming an hour per witness in total,
11 not intending that necessarily to be binding but trying to
12 sketch this out so we can inform our witnesses, it appears to
13 make sense, if Mr. Liu is available and plaintiffs intend to
14 call him, if he could be called this afternoon.

15 Other than that, the kind of witness availability
16 time frames I think are consistent with the proposed schedule.
17 And to the extent Mr. Liu is not available today and the Court
18 is inclined to hear his testimony, then perhaps he could go in
19 the morning alongside Dr. Gilbert.

20 Those are kind of the two availability issues as far
21 as witness scheduling.

22 THE COURT: All right. Does -- Mr. Cross, does
23 Mr. Liu have any limitations as to his availability?

24 MR. CROSS: He does, Your Honor. Unfortunately, he
25 is not available today. He is available tomorrow morning. He

1 is in California. So he will start early tomorrow.

2 THE COURT: All right.

3 MR. CROSS: Our thought was get him up tomorrow
4 morning after Dr. Gilbert. Because I understand Dr. Gilbert
5 has a window of time tomorrow morning before 11:00. So if he
6 goes first, we'll finish him. We'll get to Mr. Liu. He will
7 be very short, ten minutes.

8 With respect to Mr. Coomer, we have confirmed with
9 Dominion's counsel he is available today. I'm not quite sure
10 the point about an effective subpoena. I think what Mr. Miller
11 is getting at is in fairness to them we did neglect to send
12 them a copy of a notice of his subpoena.

13 But we originally subpoenaed a 30(b)(6) witness from
14 Dominion. They objected to that. And so we said, well, can we
15 just sub out Mr. Coomer for that? They agreed, and they agreed
16 to accept service, which I know Mr. Miller was aware that we
17 were withdrawing the 30(b)(6) subpoena.

18 So I don't think there is prejudice to them.
19 Mr. Coomer is obviously a big part of the case. We want to
20 examine him. He is available today.

21 The last point, Your Honor, is it is just a matter of
22 timing. If we don't put Mr. Coomer on today, tomorrow is going
23 to get tight. Mr. Coomer is a much more substantive
24 examination than Mr. Liu. We're just going to run out of
25 witnesses today based on availability, particularly because

1 we're leaving a lot of our witnesses until their case, like
2 Mr. Harvey and others who work for the State. And so I think
3 to get it done we need to get Mr. Coomer on today.

4 THE COURT: All right.

5 MR. MILLER: Your Honor, I apologize. I didn't mean
6 to interrupt.

7 THE COURT: That's all right.

8 MR. MILLER: I think in terms of, you know, tomorrow
9 being crammed, I frankly think Mr. Cross is exactly right. We
10 have in front of us a witness list that exceeds what we did
11 last year. And, frankly, you know, to the extent that the
12 parties are aware of concepts, we certainly understand that.
13 But the focus of the Court and having a witness list was so
14 that we could have some form of preparation and logistical
15 scheduling, I would assume, in terms of approach today.

16 We kind of are truthfully a little curious as to what
17 relevance Mr. Liu's testimony is going to have at all.
18 Obviously, the plaintiffs can, you know, call witnesses they
19 believe are going to put on their case. But it seems to me his
20 testimony may just be superfluous in general.

21 At the end of the day Your Honor, the concept on --
22 and I do want to clarify a couple of things as far as -- and I
23 don't believe Mr. Cross is trying to mislead. But in terms of
24 they, the way it was used in the sense of accepting service,
25 that was not the State. That was Dominion.

1 THE COURT: Yeah. I understood that.

2 MR. MILLER: So I did want to clarify that. And the
3 reality is a rule does require prior notice of a subpoena. And
4 if the plaintiffs want to have Dr. Coomer to testify, you know,
5 we certainly understand it. He is already being called as a
6 State's witness. The plaintiffs will have an opportunity to
7 cross-examine him.

8 And I think in terms of practicality, it makes a lot
9 of sense to move forward in the proposed schedule that we sent
10 the Court, which we believe is eminently reasonable in light of
11 the condensed nature of this hearing.

12 THE COURT: Well, I don't really have a schedule,
13 frankly, from you that is in order that I considered reliable.
14 I just had witnesses originally. So I never treated it as if
15 what you sent me was a -- because you-all were having such
16 difficulties in agreeing on things and agreeing also about the
17 most -- you know, the beginning fundamental issue that the
18 plaintiffs' counsel wanted to be able to go beyond the scope of
19 cross so that they wouldn't have to call a witness twice so
20 that I just, you know -- I figured you basically did not have
21 an agreement, that they were calling your witnesses and you
22 were going to then just reserve your examination until later.

23 MR. MILLER: And, Your Honor, I apologize. In terms
24 of the proposed schedule, I'm referring to the Word document I
25 sent Ms. Cole and Mr. Martin this morning and not to the

1 parties' separate witness list.

2 That proposed schedule, I think, takes into account
3 the availability and the witnesses that were called. And Your
4 Honor is correct that our position is, frankly, that
5 cross-examination should be subject to the scope of the direct;
6 alternatively, if cross-examination is subject and direct is
7 subject to the scope of the declarations, which is how we
8 proceeded last year in this case, such that essentially expert
9 declarations were treated as their report.

10 THE COURT: Well, sort of. Yeah. I wouldn't -- I
11 wouldn't say it was that limited though, frankly. But I'm --

12 MR. CROSS: Your Honor, I may be able to help. I
13 think the only real issues on the table are when does
14 Mr. Coomer get called. As a practical matter, he is available
15 today. They are going to examine him. They have always been
16 prepared to examine him.

17 So I'm not sure -- there is no prejudice from us
18 deciding to examine him as well, even though we didn't serve
19 the notice of subpoena. And I apologize for that. But there
20 is no prejudice because they were always calling him.

21 As a practical matter, let's put him up today, free
22 the man up to get back to his life. I have not heard any
23 argument as to why that has prejudiced anyone.

24 As to Mr. Liu, we may end up not needing to call him.
25 We are going to see how Dr. Halderman goes and the other

1 experts. We're going to see what Dr. Gilbert has to say, and
2 maybe we won't call him. But he is ten minutes. So I think we
3 can --

4 THE COURT: All right. Well, you can reserve the
5 time for him. I know that the highest -- the State, I assume,
6 they just want to make sure they have enough time for their
7 witnesses. So I don't have any problem with allowing it a
8 little bit of out of order.

9 But if the State would prefer to have you finish your
10 witness first, that is okay also. But I know that the State
11 has the 11:00 hard and fast time line. So that is really --
12 one or the other is fine with me. We can get them both done by
13 11:00. And we'll begin as we need to in order to do that. And
14 I'm happy to accommodate the State tomorrow morning in either
15 order.

16 MR. MILLER: Thank you, Your Honor. And just in
17 terms of the substantive aspects of Dr. Coomer -- Mr. Cross'
18 statement may get rid of the issue. But in terms of what
19 Mr. Liu is intending to testify about, those may be some items
20 that, frankly, we'll want to direct Dr. Coomer in terms of
21 response. I truly don't know as far as Mr. Liu. But that is
22 sort of the issue as to why we reserved it. But thank you.

23 THE COURT: As to Dr. Coomer, the State has him up at
24 December -- September 11, even though it says December. And I
25 was looking at that. Thank God, you have got me here forever.

1 But you have him at 2:00.

2 But my understanding was that they wanted to limit
3 Mr. Coomer -- Dr. Coomer in terms of the cross-examination.
4 And if that is the State's position, then we just have to -- he
5 will just have to come and testify twice. So it is one or the
6 other.

7 MR. MILLER: Okay. I think I understand Your Honor's
8 point there. And if it is a matter of Dr. Coomer testifying
9 tomorrow and having a scope difference as to Dr. Coomer, then I
10 think that is suitable.

11 THE COURT: Is that acceptable, Mr. Cross?

12 MR. CROSS: I don't want to be difficult, but I'm
13 worried about time, Your Honor, because --

14 THE COURT: Because you are so backed up?

15 MR. CROSS: Yeah. I mean, like -- as Mr. Miller has
16 pointed out, they won't start most of their witnesses until
17 probably late tomorrow morning. Dr. Gilbert will go early.
18 We're taking him out of order.

19 THE COURT: All right. Well, why don't you do this.
20 Why don't we do this then. I want -- you know, it would be
21 very different if we were in person. But I assume that
22 Dr. Coomer is testifying from wherever he is located.

23 So we are in a situation where it probably doesn't
24 make that much difference. He will have to testify twice. We
25 will get it done, and we won't be frozen. And it is my

1 accommodation to you and yet getting also -- I think people
2 will really need the time tomorrow.

3 So I can't tell you we'll end up having an hour break
4 if we're -- either. So all right. So you can call Coomer
5 today. And I guess the extent -- I just will say to you though
6 then don't go over the same subject matter again and again
7 tomorrow. I'm going to hold you to that.

8 MR. MILLER: Sure. Yes, Your Honor. It may well be
9 the case that --

10 THE COURT: I meant Mr. Cross. Maybe you'll have
11 something you want to do and you will say we can get rid of the
12 whole thing yourself today, Mr. Miller. If that is -- you can,
13 that is great too.

14 MR. MILLER: Okay. Thank you.

15 THE COURT: But if you can't, I realize it is your --
16 he is your witness too. And you can reserve it until the next
17 day.

18 MR. MILLER: Thank you, Your Honor.

19 THE COURT: All right.

20 COURTROOM DEPUTY CLERK: Mr. Osophski (phonetic) and
21 Mr. Strickland, please turn your video off.

22 THE COURT: You can still see us by video. We're
23 just trying not to get distracted by seeing you. Thank you
24 very much.

25 COURT REPORTER: Judge, one second.

1 Mr. Cross, could I get you to speak up.

2 MR. MILLER: Your Honor, if I may, I think just in
3 terms of logistics before we kick off with opening statements,
4 there were a couple of additional things in the proposed
5 schedule that I don't know that we necessarily -- we have a
6 time issue that we have all recognized.

7 Our suggestion was to limit direct examination to not
8 exceed 30 minutes. And that was based off of the anticipated
9 time for testimony from the final witness lists that were
10 provided to the Court and then, secondarily, that the time
11 period for cross-examination would not exceed whatever time
12 period for direct, consistent with the Court's docket entry
13 order from late August.

14 You know, frankly, those matters were in the Court's
15 purview. From the defendants' perspective, we thought they
16 made sense in trying to efficiently get through this hearing.
17 But I wanted to raise those two issues.

18 THE COURT: Mr. Cross, do you agree with that?

19 MR. CROSS: No, Your Honor. On the 30 minutes, I
20 don't think there is any witness we anticipate to go beyond 30
21 minutes -- not by much. So I think as an aspiration that is
22 fine. I just don't want to be in a position where we are cut
23 off. But I think all of our witnesses will be around there or
24 less.

25 The second point is really unworkable because, again,

1 we have agreed to forgo witnesses we would affirmatively call
2 to their case, like Mr. Harvey, Mr. Cobb. And so if our cross
3 is limited to the scope of their direct and in limited time, it
4 puts them in a position to do a five-minute direct and we can't
5 do what we would do if we were calling them ourselves.

6 So we are either in one of two worlds. Either their
7 witnesses testify twice, we do an unbounded adverse examination
8 in our case, or they testify once -- which we're comfortable
9 with. That is the most efficient -- and our cross is not bound
10 by the time that they take. That would seem to be the most
11 prudent course.

12 THE COURT: So did you-all come -- when Mr. Miller
13 sent this proposed schedule, had you agreed that -- for
14 instance, for Mr. Harvey that you would be able to exceed the
15 scope of the direct?

16 MR. CROSS: Candidly, Your Honor, I thought we had
17 worked that out yesterday. I misunderstood because we got
18 Mr. Miller's email and he indicated this was still their
19 position.

20 But we have agreed for several days that we would
21 forgo State employees, people they were calling, like their
22 experts -- we would forgo them until their case. And so I just
23 don't think you can reconcile that with the position that we
24 are then bound by the time they use on their direct for our
25 cross. It lets them game that. They can put on whatever

1 testimony --

2 THE COURT: Maybe -- maybe Mr. Miller doesn't mean
3 that.

4 MR. MILLER: In fairness --

5 MR. CROSS: Fair enough. But the bottom point --
6 gaming is not the word. The point is: If they decide they
7 only need five minutes with their witness, then we only get
8 five minutes.

9 THE COURT: I understand the point. I'm just trying
10 to find out what Mr. Miller and Mr. Tyson had in mind because
11 you-all have said now very different things. I tried to broker
12 this, you know, more than a week ago. And I keep on getting
13 different versions of things from you-all now.

14 MR. MILLER: Your Honor, I think in terms of marrying
15 the two together, the time period on direct versus cross, I
16 would suggest that perhaps that is just a default rule of
17 proceeding. And, of course, Your Honor can adjust that on an
18 ad hoc basis as things move forward.

19 Kind of separate issue -- and frankly, Your Honor, in
20 terms of the proposal, we're intending to reflect what we
21 understood the Court anticipated. If that is not what the
22 Court anticipated, then ultimately it is Your Honor's decision.

23 The secondary issue in terms of scope -- we
24 understand that, you know, the limitations we have on trying to
25 put together this quick hearing. I guess the State's concern

1 is that, frankly, we are putting up witnesses on
2 cross-examination on matters that we have no concept as to
3 where the plaintiffs are headed. If they want to take them on
4 direct, that is fine. But there is a high likelihood, it seems
5 to us, that there will be questions that probably are outside
6 of the witnesses' competence.

7 So the suggestion would be that the scope aspect be
8 tied either to the declaration or to the direct. And to
9 Mr. Cross' point, you know, to the extent we have a short
10 direct examination, we certainly would not intend to hold
11 Mr. Cross to a five-minute cross-examination because we are
12 trying to game the system on a five-minute direct.

13 That is not our intent. And I believe Your Honor
14 would call us on that fairly quickly. And Mr. Cross would as
15 well.

16 THE COURT: All right. This is what I'm going to do.
17 You-all wanted to have opening remarks. You can go ahead. I
18 think that originally the plaintiffs wanted to call some of the
19 State employees as witnesses as part of their case and said it
20 would be more efficient that way. You wanted -- then basically
21 you wanted to do it instead.

22 I'm not going to limit them since they said right
23 from the start they wanted to call them as part of their case.
24 If you-all want to change your mind about that, we can take a
25 break and talk about it. Then the plaintiffs can go, and you

1 can call them again.

2 This is what we did before. And I'm just sort of --
3 that was -- so that is how we're going to proceed at this
4 juncture. If it ends up -- I would say when we take a break
5 you-all should chat about it some more. Otherwise, I'll just
6 let the plaintiffs go beyond the scope of the direct. Because
7 I mean, that is what their original intent was to call these
8 folks. I don't think that they are going to be wide-ranging.

9 We are going -- I know we have down here a time of
10 6:00 P.M. for still calling a witness on tomorrow. So it is
11 important that we go as much as possible -- if we run out of
12 witnesses today and we have plenty of time, which would be
13 remarkable, then I'm going to ask them if there is really no
14 reason for the plaintiff not to perhaps call someone like
15 Mr. Harvey who is -- who is pretty straightforwardly factual in
16 my experience with him.

17 But -- but if the defendants object, we'll start
18 earlier on tomorrow. That's all.

19 All right. You-all wanted to make some remarks
20 first. So let's go ahead and do that.

21 MR. CROSS: Thank you, Your Honor.

22 THE COURT: And I will indicate it is essentially
23 1:30, 1:29. So ten minutes of remarks from each side.

24 And I understood that the plaintiffs were going to
25 divide their time or else allocate it to one counsel or

1 another.

2 MR. BROWN: That's correct.

3 MR. CROSS: Yes, Your Honor. I'm going to go first
4 and then hand it off.

5 COURTROOM DEPUTY CLERK: Please turn your video off
6 unless you are counsel of record, please. Thank you.

7 MR. CROSS: Ready, Your Honor?

8 THE COURT: I think we just have -- is it Sue
9 Ellen -- yes -- and Shelley. I guess some of these -- it is
10 hard to tell who is counsel of record and who is here. Some of
11 these people -- that is fine. It is fine.

12 Go ahead. But, please, if you are not counsel of
13 record, be sure to just be appearing as a name and if you want
14 a picture. But that is it.

15 Go ahead.

16 OPENING STATEMENT

17 MR. CROSS: Thank you, Your Honor. I'm going to just
18 briefly touch on three key points to frame the hearing for Your
19 Honor and what I think is the focus as we go through the next
20 couple of days.

21 Let me start with the law because there is a
22 fundamental disagreement in this case about the legal standard
23 Your Honor is to apply. Our position is that unconstitutional
24 elections are never permissible ever. The State fundamentally
25 disagrees.

1 In their papers, they say that an unconstitutional
2 election can be permitted if it is simply inconvenient, too
3 burdensome, or too late to remedy that. We think that is
4 wrong. The Supreme Court has never held that in any case. And
5 we can't imagine it ever would. But the Supreme Court has
6 repeatedly emphasized that the Constitution protects not just
7 the right to vote but to have their votes counted. And that is
8 the issue that we're focused on in this case.

9 It has also emphasized that other rights, even though
10 it is basic, are illusory if the right to vote is undermined.
11 Not eliminated. Not abolished. Simply undermined. And we're
12 going to show you in this hearing that the right to vote in
13 Georgia and to have it counted is undermined.

14 Let me just focus on two quick points, Your Honor.
15 Feasibility -- and I'll start there.

16 Can we get the first slide up?

17 So let me pause for a moment, Your Honor. The State
18 would have Your Honor believe that what we're asking for is a
19 whole new system -- fundamental change in the election system.
20 That is very, very far from reality.

21 What you are looking at here is a picture of the
22 equipment we got from Fulton County. So this is actual Georgia
23 election equipment. And there are three basic components to
24 the BMD system. There is the BMD that you can see, the
25 touchscreen. There is the printer, which is off the shelf.

1 And there is a scanner.

2 What are we asking Your Honor to order? Look, that
3 is it. Eliminate two pieces of equipment. And I'm going to
4 explain this. That is all we're asking. Take the tens of
5 thousands of BMDs which are unreliable, that are vulnerable in
6 ways we will show, glitchy in the printers, and just leave them
7 where they are but keep the rest of the system. Keep the
8 scanners. Keep the EMS. Keep the poll workers who are trained
9 on paper ballots, so on and so forth.

10 How do we know that you can do this with the existing
11 system? Let me be clear. This isn't 2018 where we were
12 changing the GEMS system. This isn't 2019 when they were first
13 rolling out the BMDs. This is take the existing system and the
14 training and use hand-marked paper ballots.

15 Here is how we know that they can do it. Next slide.
16 This is the emergency paper ballot plan that the State has sent
17 out. And I'm going to focus you quickly on a couple of
18 provisions. So let me blow up the first one.

19 What this provides is that under a variety of
20 circumstances the State is supposed to use or the counties are
21 supposed to used hand-marked paper ballots. And that can be if
22 there are too few machines, the machines don't work, wait times
23 are too long, longer than 30 minutes.

24 Think about June. These circumstances happened all
25 across the counties in ways even worse than we first imagined

1 based on the discovery we have gotten. And we'll show you
2 this.

3 And we know that it is going to be worse in November
4 with a much bigger turnout. So they are going to have to have
5 lots and lots of hand-marked paper ballots, paper ballots to be
6 marked by hand.

7 How do those get tabulated? Exactly like the BMD
8 ballots. This is the key. The first bullet, we're talking
9 about marking ballots by pen at the polls. What happens?
10 Those get scanned in to the same Dominion scanners right there
11 in the precinct exactly in the same manner as the BMD
12 ballots -- in the same manner.

13 So the only change we're talking about is when the
14 voter walks in, instead of having them deal with a bunch of
15 equipment, instead of having the counties set up a bunch of
16 equipment, simply hand the voter a paper ballot and a pen. And
17 from there, everything happens the same.

18 Let me just briefly finish on security, Your Honor,
19 because what we're going to show you is the reason this simple
20 solution is necessary is because we have got a voting system
21 that's fundamentally unsecure.

22 Next slide. First, Your Honor, they have not offered
23 a single election security expert to endorse Georgia's BMD
24 system. They could not find one. They haven't even allowed
25 their experts to examine that system. Dr. Gilbert has never

1 used it.

2 Next, Your Honor, we're going to show you that the
3 BMD system is readily hackable in similar, if not worse, ways
4 than the DRE system Your Honor already found unconstitutional.
5 Dr. Halderman and others are going to show that to you
6 firsthand.

7 We also know next that of the many security
8 vulnerabilities that Fortalice found years ago most of those
9 are still out there in the system unremediated. And despite
10 Your Honor's directive for them to work with their consultant
11 on that, they have done nothing in two years.

12 We also now know -- next point -- evidence confirms
13 that we now have there is, in fact, connectivity between the
14 old system and the new that allows the spread of malware.

15 Lastly, Your Honor, they are going to say audits.
16 They are going to tell you that audits are the superman of
17 election integrity to save the day. Not in Georgia.

18 First of all, Your Honor, Dr. Gilbert himself is
19 going to admit -- he was forced to admit in his declaration --
20 that very few voters, a study he himself cites Your Honor to --
21 very few voters even examine their ballots. And among those
22 who do, they routinely do not miss errors and anomalies.

23 And, in fact, although Dr. Gilbert spent a lot of his
24 declaration a year ago talking about audit procedures and how
25 he thought that they would work out well in Georgia, his latest

1 declaration says he is offering no opinions on the audit
2 procedures in Georgia. The man wouldn't even address it for
3 Your Honor this time around now that we have some proposed
4 rules. And it is no surprise because Georgia has no reliable
5 RLA procedures, which he says are critical.

6 In fact, what they have proposed, at least the latest
7 proposal we have seen, is a single RLA for a single election
8 picked by the Secretary of State every other year. Not even
9 close to what Dr. Gilbert says is needed, which is RLAs across
10 the state for every race.

11 So I'm going to hand it off to Mr. Brown, I believe,
12 Your Honor, with this. The solution we are proposing is very
13 simple. It takes the existing infrastructure. It uses that
14 infrastructure and provides constitutional elections for our
15 clients and for voters across the state. And it is not ever
16 permissible to allow an unconstitutional election, and that is
17 what will happen if there is no relief.

18 Thank you, Your Honor.

19 OPENING STATEMENT

20 MR. BROWN: Thank you, Your Honor. Bruce Brown for
21 the Coalition plaintiffs. The upcoming election will be one of
22 the most controversial and chaotic in the nation's history.
23 The question today is whether in the midst of this chaos
24 Georgia will be able to say at the end of the day that it knows
25 who won the election. And this it cannot do with the existing

1 equipment.

2 We will put up Dr. Philip Stark, who is the
3 preeminent expert on election auditing. And he will testify
4 that no quality of audit, no matter how good the audit is, with
5 the existing equipment, Georgia will not have an auditable or
6 accountable election.

7 Your Honor held in 2018 before the State purchased
8 the system that if a new balloting system is to be launched in
9 Georgia it must -- it should address democracy's critical need
10 for transparent, fair, accurate, and verifiable election
11 processes that guarantee each citizen's fundamental right to an
12 accountable vote.

13 And, Your Honor, the question -- the defendants will
14 say there is a lot of -- lot of dispute, that there's facts on
15 both sides, that there is an academic dispute. There is not.
16 Every time you hear the phrase it is just policy preference or
17 there is a factual dispute or all elections are insecure to
18 some degree, that is code for we don't have any evidence to
19 support our position. Because they don't.

20 The evidence and the science and the law is
21 undisputed. All that remains is the noise that you will hear
22 from the defendants, which you will not hear witnesses as
23 Mr. Cross -- you will not hear experts as Mr. Cross explained.

24 You will also hear from Harri Hursti, internationally
25 recognized cybersecurity expert and ethical hacker, who will

1 explain his own observations and his own expertise about in an
2 alarming detail as to the complete absence of the security
3 infrastructure protecting Georgia's election system from either
4 a malicious attack or an innocent programmer.

5 I, of course, would echo Mr. Cross' statements about
6 the simplicity of his solution. But I would also say that what
7 is crippling Georgia now is the complexity of the system. So
8 the proposed solution does two things. It provides an
9 accountable election, which the Constitution guarantees to its
10 citizens. But it also dramatically decreases the complexity
11 that is crippling Georgia right now. And it is unable to show
12 again that not only is it putting forward a vulnerable system
13 but it is institutionally incapable of protecting it in a way
14 that is acceptable to the community.

15 Your Honor, we have two other issues that I will
16 address very quickly. One -- and these are independent of the
17 switch from hand-marked paper ballots. And we'll address this
18 further in the hearing.

19 One is to the extent -- the first is the paper
20 pollbook backups. Separate issues in a separate motion. We
21 believe that is fully briefed and that there are undisputed
22 facts on that. And the State has no good reason for not at
23 this point -- that remedy would have fixed the meltdown in
24 June. And if it is not fixed, we'll have another meltdown in
25 November. As the lines get longer and longer, here is what

1 happens now, Your Honor --

2 THE COURT: Why don't you move on because I certainly
3 read all about this. And I understand. And you-all are at ten
4 minutes. So wrap it up.

5 Is there something else -- do you want to flag the
6 other things?

7 MR. BROWN: The other things is on the scanning, Your
8 Honor. The scanning -- you will hear evidence on that.

9 So thank you very much for your time.

10 THE COURT: You are very welcome.

11 MR. TYSON: Your Honor, I'll be proceeding for the
12 State when you are ready.

13 THE COURT: I'm ready.

14 OPENING STATEMENT

15 MR. TYSON: Thank you, Your Honor. Bryan Tyson for
16 the State defendants. One thing we all agree on is this is a
17 critically important case.

18 The plaintiffs are asking this Court to be the first
19 court in the country to find that a paper ballot election
20 system using ballots marked by ballot-marking devices violates
21 the United States Constitution. And after the plaintiffs ask
22 you to reach that question, they are also asking for relief on
23 any variety of other components in the system, including Poll
24 Pads, scanner thresholds, and audits. But this Court should
25 not grant any relief in its attempt to undermine the public

1 confidence in the legitimacy of Georgia's elections.

2 When this Court denied a third round of preliminary
3 injunction motions last month, it found that the evidence
4 presented was insufficient as a matter of law to determine that
5 the Dominion BMD system was facially unconstitutional. And you
6 left open the question of whether further evidence would
7 support an as-applied challenge. And the Court relied heavily
8 on the intent of the plaintiffs to significantly supplement
9 their evidence.

10 What we're going to see over the next few days is not
11 a significant amount of new evidence. What we're going to see
12 is a series of recycled theories and conjecture using this
13 court as a platform.

14 Indeed, in response to the State defendants'
15 expedited discovery seeking evidence of malware that could
16 alter election outcomes or any evidence of any actual
17 compromise of the prior voting system in Georgia, Curling
18 plaintiffs' entire document production in response was one
19 email from almost a year ago just speculating about a variety
20 of attacks on a system they had not examined.

21 Further, as the briefing demonstrated, the Coalition
22 plaintiffs thought they had uncovered a major problem with the
23 timestamps but instead simply misread the Dominion manuals and
24 didn't understand how Georgia's system actually worked.

25 There simply is not a significant amount of new

1 evidence. Or if there is, the plaintiffs are not letting it be
2 tested through the adversarial process. But I want to begin
3 where the Court must, with the law.

4 For the first prong of a preliminary injunction in
5 this case, under the Anderson-Burdick balancing test, this
6 Court must first find a burden on the right to vote created by
7 the use of Georgia's new electronic voting machine, then
8 categorize the burden from mild to severe if it finds one
9 exists, and then balance the State's interests. The evidence
10 is going to show there is not a burden on the right to vote.

11 The plaintiffs offer a series of theories that are
12 still not backed up by any evidence of any compromise of a
13 component of any part of the system. The plaintiffs are unable
14 to connect any of those dots they are putting on the page. And
15 everything they offer is speculation. But even if they could
16 connect the dots to an actual compromise somewhere, any burden
17 is extremely slight on voters because, unlike the DRE system,
18 voters have the opportunity to verify the ballots that are
19 counted by the scanners and then audited using a risk-limiting
20 audit that Dr. Adida has testified addresses potential QR code
21 errors.

22 And so taking that vanishingly small burden and
23 weighing it against the State interests and clear voter intent
24 and access for disabled voters in the orderly administration of
25 elections, and a timely processing of returns, all those things

1 counsel in favor of finding that the State's interests
2 dramatically outweigh any minute burden on the right to vote if
3 it is even there through the use of BMDs. This Court cannot
4 get to a question of remedy unless the plaintiffs get past that
5 first hurdle, which they cannot.

6 And then moving to the second prong of a preliminary
7 injunction, there is no irreparable harm here. Plaintiffs can
8 go vote a paper ballot marked by hand and deposit it in a
9 dropbox. They cannot have an injury based on the outcome of an
10 election, as the Eleventh Circuit made clear in *Jacobson*, only
11 their own votes being counted.

12 Ultimately, plaintiffs want to vote using a different
13 system in their precinct. That is a policy position they
14 advocated for in the Georgia General Assembly and lost. And
15 now they ask this Court to impose what they could not persuade
16 policymakers was a better system.

17 And then the third and fourth prongs on equities and
18 public interest also favor in denying relief. In this act of
19 this case, the plaintiffs have put forward no evidence from
20 anyone with statewide experience that the remedies they seek
21 are even feasible on the time line that we are on.

22 We have discussed we have more witnesses scheduled
23 for this hearing than any of our prior hearings. But the Court
24 has already found in 2018 that September was too late to make a
25 change. And nothing has changed from that decision. Absentee

1 ballots for November go out next week. Early voting starts
2 October 13. We are on the eve of a November election. We are
3 in the election.

4 Where are the election administrators who said last
5 year that plaintiffs' proposed relief was feasible? They
6 aren't here and for good reason. Because the kinds of relief
7 they are proposing cannot be implemented before or after the
8 November elections.

9 So let's talk a little bit about that relief.
10 Eliminating BMDs for the November election, Mr. Cross says it
11 is very simple, it is very easy, you just take two components
12 out. The Court has already noted that it seems like it is
13 unlikely at this juncture in the case. But during our
14 conversation yesterday, the Court noted the plaintiffs were
15 still sorting through their own issues.

16 And the so far undisputed evidence is there is not
17 enough capacity to preprint and handle millions of additional
18 paper ballots for the November election, let alone deploy all
19 of those ballots and ballot combinations, possibly thousands in
20 some counties, to every early voting site when early voting
21 begins in a little over 30 days.

22 An emergency ballot provision that is for a limited
23 purpose on election day is not a framework under which the
24 State can conduct an election under an entirely hand-marked
25 paper ballot system.

1 The other relief that plaintiffs seek ask the Court
2 to involve itself in the administrative details of an election,
3 which the Eleventh Circuit has said federal courts may not do.
4 Mr. Brown talked about paper pollbook backups. The State
5 already does this. The undisputed evidence is that it is a
6 burden -- a severe burden to print them as requested by the
7 Coalition plaintiffs. There is nothing in response to that in
8 evidence.

9 Scanner thresholds. Even if it was jurisdictionally
10 appropriate for this Court to weigh in, the State considered a
11 variety of options regarding scanners and set rules for the
12 thresholds through regulation. And, again, the undisputed
13 evidence showed that having a human check every stray mark made
14 by a voter who disregards the instructions to fill out their
15 hand-marked ballot properly will lead to delays in
16 certification. And that is a huge issue in a presidential
17 election year.

18 Mr. Cross and Mr. Brown say audits are worthless.
19 The State worked with the national organization, VotingWorks,
20 to design a risk-limiting audit based on models used in other
21 states. Georgia is going to be one of only a handful of states
22 conducting a precertification statewide risk-limiting audit in
23 November 2020.

24 There is absolutely no basis for this Court to order
25 a different process than the one that took almost a year to

1 design. And there is no reason for this Court to intervene in
2 what is ultimately an academic debate about the role and scale
3 of audits, especially to say the U.S. Constitution mandates a
4 particular audit process when it leaves the administration of
5 elections to states.

6 Your Honor, this case is about Georgia's BMDs. This
7 case is about Georgia's scanners. The people of the State of
8 Georgia can and should have confidence in their election
9 system, and this Court should not find otherwise.

10 We can verify our ballots. Georgia will utilize a
11 risk-limiting audit before certifying. This Court should deny
12 plaintiffs' attempts to undermine the legitimacy of Georgia
13 elections by their attacks on election technology,
14 especially -- especially in an emergency motion context.

15 And I want to be very clear about this. The
16 plaintiffs are going to have the chance to make their case.
17 That is how litigation works. But that should not take place
18 on a lower standard rushed schedule like is happening right
19 now.

20 This case has been going on for three years. It
21 started as an election contest in the Karen Handel/John Ossoff
22 race in 2017. Then it was a case challenging DREs. Then it
23 was a case challenging BMDs. And now it is a case challenging
24 BMDs, scanners, and any other piece of election technology
25 plaintiffs can think of.

1 The adversarial process exists for a reason. And
2 this Court should deny plaintiffs' attempt to seek massive
3 changes to Georgia's election system on incomplete, rushed, and
4 untested evidence.

5 Because of the significance of this case, the
6 plaintiffs' claims should be put to that test with experts for
7 each side evaluating what they are saying, not conducting a
8 trial by ambush. After discovery and fair testing, the Court
9 can then rule on their claims at that time.

10 But in the meantime, Your Honor, the Court should
11 deny act four of the preliminary injunction motions and let
12 this case proceed to act five where it can be resolved through
13 the application of the Federal Rules of Evidence and the
14 Federal Rules of Civil Procedure by this Court.

15 Thank you.

16 THE COURT: Thank you.

17 I just want to remind everybody attending the hearing
18 that if you are not counsel of record please eliminate your --
19 the imaging for yourself. You can still watch the video
20 without my seeing you and being distracted or counsel seeing
21 you and being distracted.

22 So there are several people who are right now
23 appearing visually. And I'm trying not to call people out. I
24 don't know all the people who virtually are here present. But
25 I can see that there are many people who are still not

1 controlling your video so that you are not appearing.

2 So all you have to do is cross your -- basically put
3 a strike through the video so you are not appearing. You will
4 still be able to see everything.

5 COURTROOM DEPUTY CLERK: Thank you, Mr. Strickland.

6 Amy C., are you able to disable your video please?

7 Amy C., please turn your video off.

8 THE COURT: You are waving at us now, Amy. So I'm
9 not --

10 UNIDENTIFIED SPEAKER: Maybe they don't know how.
11 Maybe you should instruct --

12 COURTROOM DEPUTY CLERK: I'm going to remove her from
13 the hearing and she can call back in using the audio only line.

14 Okay. It looks like she was able to turn it off.

15 THE COURT: All right. Very good. All right.

16 Thank you for your remarks. A fair amount of heat
17 for opening remarks, let me just say, from all sides. And I
18 know that everyone feels very strongly about this.

19 I want to say one thing though. Having heard this
20 case for some time, I do not think it is an accurate
21 description of the third -- the Court's ruling in the summer
22 not granting the relief on the facial basis to say that we went
23 through a full preliminary injunction hearing.

24 The reality is there was a motion to dismiss, there
25 was a motion for preliminary injunction, there was a facial

1 challenge. I had a hearing, which I basically was asking
2 questions because there were issues I wanted to understand.
3 And it wasn't an independent opportunity for the plaintiffs to
4 present and even at points cross-examine witnesses. And I
5 asked the State to explain to me some issues that I was not
6 clear about from their presentation and from the plaintiffs'
7 presentation. And that was the essence of what occurred.

8 So I want to be clear that I do not -- I do not view
9 that as an evidentiary hearing. I denied it as a facial
10 challenge after looking at it with the additional information
11 made available.

12 Unfortunately because of the pandemic, I felt myself
13 was not able to turn right back to writing about it. And I
14 apologize to you-all for that. And the schedule as it was --
15 that basically got moved later than I would have preferred
16 because of the challenges that we have had this spring.

17 That hearing was held approximately, I think, a week
18 or so before the Court basically stopped -- it continued to
19 hear -- have cases. But it was not able to have hearings. And
20 everyone understands what happened at that juncture.

21 So in my view, that is how -- just in terms of the
22 schedule, a fuller description of what has happened in the last
23 half year and how we got here at this date.

24 All right. It is now 1:55. Do plaintiffs want to
25 call your first witness?

1 MR. BROWN: Thank you, Your Honor. The Coalition
2 plaintiffs will call Dr. Philip Stark.

3 COURTROOM DEPUTY CLERK: If you would, please raise
4 your right hand.

5 **(Witness sworn)**

6 COURTROOM DEPUTY CLERK: All right. Please, sir, if
7 you would state your name and spell your last name for the
8 record.

9 THE WITNESS: Philip Bradford Stark, S-T-A-R-K.

10 Whereupon,

11 PHILIP B. STARK, PH.D.,

12 after having been first duly sworn, testified as follows:

13 DIRECT EXAMINATION

14 BY MR. BROWN:

15 **Q.** Thank you, Dr. Stark. Dr. Stark, this is Bruce Brown
16 representing the Coalition plaintiffs.

17 Can you hear me okay?

18 **A.** Yes, sir.

19 **Q.** Dr. Stark, by whom are you currently employed?

20 **A.** University of California at Berkeley.

21 **Q.** And what do you teach?

22 **A.** I teach statistics.

23 **Q.** And you have submitted a number of declarations in this
24 case; correct?

25 **A.** Yes, sir.

1 Q. I believe in your first one, you included a copy of your
2 CV; correct?

3 A. Yes, sir.

4 MR. BROWN: And just for the record, that is with
5 Document 296, Your Honor.

6 Q. (BY MR. BROWN) And, Dr. Stark, did you invent the
7 risk-limiting audit?

8 A. Yes, I did.

9 Q. Have you testified in court and Government entities about
10 election auditing and election security?

11 A. Yes, sir. On a number of occasions.

12 Q. Now, beyond your expertise in election auditing, I would
13 like to focus your attention on your experience in election
14 security.

15 What experience or expertise do you have with election
16 security?

17 A. Well, I'm on the cybersecurity subcommittee of the
18 Advisory Board of U.S. Election Assistance Commission. I have
19 been on the program committee of two election security
20 conferences for about six years now.

21 I have published 17 or 18 peer-reviewed publications in
22 election security journals and conference proceedings. I have
23 testified to the California Little Hoover Commission about
24 election security.

25 I have advised Secretaries of State in Colorado and

1 California on matters related to election security, as well as
2 the election commissions of Nigeria, Mongolia, and Denmark.

3 I was asked to co-author a manual or report on election
4 forensics for the Venice Commission of the Council of Europe.
5 A number of other things.

6 **Q.** Thank you.

7 MR. BROWN: Your Honor, I would tender Dr. Philip
8 Stark as an expert in the fields of election auditing and
9 election security.

10 THE COURT: Any objection? Is there any objection?

11 MR. MILLER: I apologize. This is Carey Miller. We
12 were unmuting. We are readjusting for our Zoom issues.

13 I -- the State defendants would assert an objection
14 to the extent that the expertise of Dr. Stark is being offered
15 for. It goes beyond the concept of auditing.

16 And if Your Honor would prefer, we can conduct a voir
17 dire at this point or subsequent in our cross-examination.
18 That is perfectly fine too.

19 THE COURT: You can do it later.

20 MR. MILLER: Thank you.

21 **Q. (BY MR. BROWN)** Dr. Stark, have you developed an opinion
22 on whether BMDs, like the BMDs used in Georgia, guarantee a
23 transparent, fair, accurate, and verifiable election?

24 **A.** Yes. They do not.

25 **Q.** And in general terms, why don't they?

1 **A.** Introducing electronics between the voter and the paper
2 record in effect makes the paper record hackable. The machines
3 themselves are vulnerable to misconfiguration, software bugs,
4 and hacking.

5 Evidence is that the vast majority of voters do not notice
6 errors in the BMD printout. Those who do have no mechanism by
7 which they can cry foul and prove to a poll worker or election
8 official or anybody else that there was, in fact, a
9 malfunction, that the ballot-marking device didn't do what it
10 was supposed to do.

11 There is essentially no practical way to detect hacking of
12 ballot-marking devices. And as a result, the paper record
13 produced by ballot-marking devices is not a trustworthy record
14 of voter intent.

15 **Q.** Dr. Stark, you may have heard in the opening that counsel
16 for the State asserted that Georgia was going to do a
17 risk-limiting audit of these elections.

18 And I want to ask you: Would a risk-limiting audit of
19 these elections be effective and, if they are effective, what
20 would they show or not show?

21 **A.** If they were to conduct a genuine risk-limiting audit
22 including a compliance audit to ensure that the chain of
23 custody of the paper hadn't been broken, that the paper trail
24 is as it was when it was cast by the voters, all that a
25 risk-limiting audit could accomplish is to confirm that the

1 whole manual tabulation of the paper record would give the same
2 winner or winners as the electronic tabulation of that paper
3 record did. It would do nothing to detect or correct any
4 problems in the generation of that paper record by the
5 ballot-marking devices.

6 To the extent that ballot-marking devices misprinted
7 voters' intentions, there is nothing that a risk-limiting audit
8 could do to detect that or recover from it.

9 **Q.** Dr. Stark, you mentioned vulnerability. Does your opinion
10 about the efficacy of a risk-limiting audit depend upon the
11 degree of vulnerability that the Court might find that the
12 Georgia system is subjected to?

13 **A.** Unless there were a way to guarantee that every single BMD
14 printout was correct, that it correctly reflected what was
15 shown to the voter on the screen or spoken into the voter over
16 the audio interface, then there is a problem that cannot be
17 rectified by any kind of auditing.

18 So provided they are not perfect, this problem exists.
19 The materiality of the problem is going to depend on the number
20 of voters who vote using ballot-marking devices.

21 **Q.** Dr. Stark, the evidence will show that there is some --
22 there's studies that have been conducted that show that some
23 voters do, in fact, verify their ballots.

24 Why isn't that enough to either be a random kind of
25 sampling or enough to alert officials there might be a problem?

1 **A.** There are several questions wrapped up in that. I'll try
2 to untangle it.

3 So first of all, some voters noticing that there was an
4 error in the printout and requesting a fresh opportunity to
5 mark a ballot does nothing for the voters who didn't check or
6 didn't request a fresh opportunity. So it only corrects those
7 votes where the errors were caught.

8 Secondly, the number of voters who would request a fresh
9 opportunity to mark a ballot may be very, very small.
10 Certainly not enough to arouse suspicion.

11 Conversely, if election officials were willing to take
12 voters' assertions that the device misbehaved as proof that the
13 device misbehaved, the only recourse would be to hold a new
14 election. There is no way to go back and figure out which
15 votes were affected, how many votes were affected, and what the
16 correct outcome of the contest should have been.

17 **Q.** Dr. Stark, is there some kind of pre-election testing
18 though that the State could conduct that would ensure that the
19 BMDs don't misbehave in such a manner?

20 **A.** There is pre-election testing that the State should
21 conduct routinely, logic and accuracy testing. But that
22 testing can generally only detect gross misprogramming errors,
23 gross configuration errors.

24 There is no way that it can suffice to show that on
25 election day the devices do not alter enough votes to change

1 the electoral outcome of one or more contests.

2 **Q.** I also heard the assertion that, you know, a BMD printout
3 is in English, the voter is free to verify it.

4 How can there be question of voter intent if the voter has
5 that opportunity?

6 **A.** Well, again, there's several issues there. BMD, kind of
7 by its nature, erases all direct evidence of voter intent.
8 There's no way to tell from a BMD printout what the voter
9 actually saw on the screen, what the voter did with the device,
10 what the voter heard through the audio interface. So it really
11 becomes trusting the computer at that point.

12 Yes, the ballots are printed in English. Ballots in
13 Georgia, ballots in California are quite long. They typically
14 vote on very many things. I understand that in the primary
15 this summer there were something like 29 issues to vote on in
16 Fulton County, if I'm recalling correctly.

17 The evidence is that most voters don't check, that those
18 who do check often miss problems that are actually there. And
19 I personally would not be able to recall how I voted on 29
20 different things without using a sample ballot or some kind of
21 paper record of what -- how I intended to vote.

22 **Q.** I want to focus your attention on: Of the few voters who
23 might check their ballot and the fewer still who might check --
24 detect an error, if they go to a poll worker, what are the poll
25 workers' options?

1 **A.** Well, in most states -- and I assume in Georgia as well --
2 the poll worker should give the voter a fresh, unmarked ballot
3 to have a do-over, to mark the ballot again, or mark a fresh
4 piece of paper.

5 The -- the poll worker or the election official is really
6 in a bind because there is no way for an election official to
7 tell whether when a voter requests a new opportunity to vote it
8 is because the voter made a mistake, the machine malfunctioned,
9 or the voter is just crying wolf and trying to cast out on the
10 outcome of the election.

11 The fundamental problem with ballot marking or a
12 fundamental problem with ballot-marking devices is that they
13 make voters responsible for the security of the system but
14 don't provide the voters with evidence that the voters can then
15 show anyone else to demonstrate that this was a problem.

16 **Q.** Dr. Stark, have you looked at the issue of how many hacks
17 would be necessary to go detected or undetected in an actual
18 election given some assumptions about the number of voters who
19 might detect that problem?

20 **A.** Yes, sir. I prepared a demonstrative exhibit using as an
21 example the Attorney General's conference -- I'm sorry --
22 contest in Georgia in 2018.

23 MR. BROWN: And at this point, Your Honor, I would
24 like to ask that Dr. Stark's Demonstrative Exhibit Number 1 be
25 shared on the screen.

1 THE COURT: All right. Have you shared it with the
2 defense counsel?

3 MR. BROWN: No, I have not, Your Honor.

4 THE COURT: All right. Well, I'll let you show it.
5 But please have everything else -- anything else that you-all
6 can share in advance, I would appreciate your doing that.

7 MR. BROWN: Thank you, Your Honor.

8 THE COURT: Both sides.

9 MR. BROWN: Can everybody see this exhibit, Your
10 Honor? Can you see that?

11 THE COURT: I am just looking at whether I can get it
12 up larger. That is all. It is all my eyesight.

13 MR. BROWN: Mine too.

14 THE COURT: All right. That is better. Thank you.

15 THE WITNESS: It helps me too.

16 **Q. (BY MR. BROWN)** Dr. Stark, can you tell the Court what
17 Stark Demonstrative Exhibit Number 1 is -- what it shows?

18 **A.** The official results for the Georgia Attorney General
19 contest in 2018, Chris Carr beat Charlie Bailey 51.3 percent to
20 48.7 percent.

21 That margin, the way it is expressed here, is about
22 2.6 percent, which is not especially small as margins go.
23 There were a total of just shy of 4 million ballots cast in all
24 of Georgia of which a little more than ten percent were cast in
25 Fulton County.

1 The table shows various hypothetical situations. In the
2 left column, the left column indicates what fraction of voters
3 cast their mark of their votes using a ballot-marking device.
4 The first three rows are for every voter using a BMD. The next
5 three rows are for half the voters using BMDs. The last three
6 rows are what happens if only five percent of voters use BMDs.

7 Then the next column is the rate at which voters noticed
8 errors and requests a fresh opportunity to mark a ballot. The
9 6.6 percent figure comes from experiments done, a study by
10 Matthew Bernard, Alex Halderman, and others from the University
11 of Michigan. That was the rate that they found which voters
12 would notice errors in their ballots without any prompting.

13 20 percent is an optimistic number. That was a number
14 that that study found through the rate of detection with
15 appropriate verbal prompting of voters to review their ballots
16 just before the voters scanned the printout.

17 And 76 percent is an even more optimistic figure. It
18 comes from a study by Kortum, et al., at Rice University where
19 they found among voters who did review their ballots on average
20 across the experimental conditions that they used 76 percent
21 noticed errors. Though, if you could get every voter to review
22 his or her ballot, the BMD output, then perhaps one might
23 attain a 76 percent rate of noticing errors in the output.

24 The third column is the rate at which votes would need to
25 be altered in order to alter the outcome of that Attorney

1 General contest. So, for example, in the first row, by
2 altering 1.4 percent of BMD printouts, you could change the
3 outcome of that contest.

4 The fourth column is the rate at which voters who used
5 ballot-marking devices would request a new opportunity to mark
6 a ballot on the assumption that they have that detection rate
7 and that hacking rate, that rate of altered votes.

8 And the final column is, if this alteration of votes were
9 uniform across the entire State of Georgia, the number of
10 voters in Fulton County who would request a new opportunity to
11 mark a ballot.

12 **Q.** Dr. Stark, just in your -- the hack rate would be the
13 number of votes that needed to be changed, say, from Bailey to
14 Carr or from Carr to Bailey; correct?

15 **A.** Yes, sir. But only -- I'm assuming that the only votes
16 that get altered are votes that are cast using ballot-marking
17 devices.

18 **Q.** And does your -- do your numbers assume that the voters
19 who cast this mistake -- their votes are switched to be
20 correct?

21 **A.** Yes. I'm assuming that if they catch an error and request
22 a fresh opportunity to vote that second marking of a ballot is
23 not altered.

24 **Q.** So even if the diligent voters who catch this mistake get
25 that fixed, a relatively tiny hack rate could still change the

1 election; correct?

2 **A.** Yes, sir. A relatively low rate of errors in the
3 printout. And that would generate an even lower rate of
4 do-over requests in the polling places.

5 **Q.** I want to focus your attention and on the rows as you go
6 down -- not the columns but the rows.

7 And what do you see as you decrease the percentage of
8 voting systems that are BMDs?

9 **A.** In order to alter the outcome of the contest would then
10 require altering a larger and larger percentage of the
11 BMD-marked paper printouts.

12 So starting -- if everyone votes on a BMD and let's take
13 20 percent as a relatively optimistic figure, which would
14 require specific interventions to attain -- particular ways of
15 reminding voters -- so if everyone voted on a BMD, the do-over
16 rate would be on the order of three voters in a thousand,
17 .3 percent, .003. If only half of the voters voted on BMDs,
18 that would double. It would still be less than a percent. It
19 would be six voters in a thousand.

20 But if you restricted the use of BMDs to a much smaller
21 set of voters, voters who particularly benefit from the
22 accessibility advantages such as AR BMDs, then that do-over
23 rate would rise to 6.4 percent, .64 out of a thousand, among
24 those voters who marked their ballots using ballot-marking
25 devices.

1 MR. MILLER: If I may, I apologize. This is Carey
2 Miller. I'm trying not to interrupt and realizing that we are
3 on a Zoom hearing here. But I don't want to waive any
4 objections.

5 It seems at this point that the demonstrative has
6 gone a little beyond just a demonstrative and is what appears
7 to be an attempt at substantive evidence. They are welcome to
8 bring in Dr. Starks' declaration for which there is no,
9 frankly, discovery as to the basis of the opinion.

10 I understand if Your Honor wants to proceed as a
11 matter of efficiency, but I just wanted to ensure we weren't
12 waiving anything with this being the first witness today.

13 THE COURT: All right. Your objection is noted.

14 MR. BROWN: Thank you, Your Honor.

15 And if we can take this demonstrative exhibit down
16 for now. And we can pull it up on cross if the State has some
17 questions about it.

18 THE WITNESS: I'm sorry.

19 **Q.** (BY MR. BROWN) Dr. Stark, I wanted to change gears a bit.

20 **A.** May I make a clarifying comment?

21 **Q.** Sure. Sorry.

22 **A.** There are calculations of this form in one of my
23 declarations. These specific numbers aren't there. But
24 calculations of the same form are.

25 **Q.** And I believe they are also in the article that you cite

1 in one of your declarations as well?

2 **A.** Yes.

3 **Q.** Now, I want to switch gears. The State will contend that
4 the audit that is being done by the VotingWorks I believe is
5 the name of the application or the company, which Dr. Adida is
6 associated with, will be sufficient to show that the results
7 are verifiable.

8 Now, have you reviewed Dr. Adida's declaration?

9 **A.** Yes, sir.

10 **Q.** And do you believe that Dr. Adida says that, or, if he
11 did, if that were consistent with your opinion?

12 **A.** No, sir, he didn't say that.

13 **Q.** And why -- what do you mean?

14 **A.** What Dr. Adida said was if every voter checks the human
15 readable portion of the ballot and -- and confirms that it
16 correctly reflects that voter's intention and a risk-limiting
17 audit uses the human readable portion of the ballot as the
18 basis for the audit, then errors in the QR code, where the QR
19 code doesn't represent what the human readable portion is,
20 could be detected by an audit.

21 **Q.** And in your view, does the RLA that would be conducted by
22 Mr. Adida's firm verify the election -- Georgia's election
23 results in any meaningful way?

24 **A.** No, sir.

25 MR. MILLER: Your Honor, just in terms of where we

1 are characterizing testimony, I object to the compounding and,
2 frankly, leading questions. Again, I am not trying to make a
3 Zoom hearing more difficult than it already is. But I want to
4 raise that.

5 COURT REPORTER: Mr. Miller, I'm going to have to be
6 able to see you. I cannot hear and I cannot see him.

7 MR. MILLER: I'm sorry.

8 THE COURT: Ms. Cole said she was having trouble
9 hearing you too. You are a little bit remote. I'm able to.
10 But I'm not having to transcribe it.

11 MR. MILLER: Thank you. We'll work on our
12 microphones.

13 THE COURT: All right. Your objection is noted. I
14 think for efficiency purposes though since we are not on
15 rebuttal and like a whole set of witnesses after your -- after
16 Mr. Adida is now scheduled to testify in your case at 5:00 P.M.
17 tomorrow, there is no choice but to allow Mr. Stark to comment
18 on what he perceived as Mr. Adida's actual testimony based on
19 his affidavit.

20 I do want to say though that it is 2:20, basically
21 2:19. So we are kind of at 25 minutes into Mr. Stark's
22 testimony.

23 MR. BROWN: Your Honor --

24 THE COURT: Y'all projected about an hour including
25 cross-examination, I think.

1 MR. BROWN: Your Honor, unless you have some
2 questions for Dr. Stark, at this point, we will reserve any
3 further questions for redirect.

4 THE COURT: All right. Well, I think I will wait
5 until State's counsel has an opportunity to examine Mr. Stark.
6 Thank you.

7 MR. BROWN: Thank you, Doctor.

8 MR. MILLER: Thank you, Your Honor.

9 **(There was a brief pause in the proceedings.)**

10 COURT REPORTER: I am not going to be able to take
11 him down, Judge, if he doesn't get on the screen. I cannot
12 hear him.

13 THE COURT: All right. Ms. Welch, are you able to
14 see him? Have you looked at -- and you are looking at gallery
15 view?

16 COURT REPORTER: Yes. One of my boxes is being taken
17 up by Emily Levy. Otherwise, it is counsel of record.

18 THE COURT: Mr. Martin, are we able to move people in
19 terms of the sequence?

20 COURTROOM DEPUTY CLERK: No, ma'am. I'm not capable
21 of that. The only active videos are on the front screen.

22 COURT REPORTER: I can see Mr. Miller now. I can see
23 Mr. Miller now. He has popped up. But he is way away from the
24 mic. I can try.

25 MR. MILLER: Apologies for that, Your Honor, and

1 Ms. Welch.

2 THE COURT: No problem.

3 **(There was a brief pause in the proceedings.)**

4 CROSS-EXAMINATION

5 BY MR. MILLER:

6 **Q.** Good afternoon, Dr. Stark. How are you?

7 **A.** Good afternoon. Fine, aside from the fact that it looks
8 like Armageddon out the window.

9 **Q.** It is hard to separate the reality of the COVID outside
10 from the Zoom on the inside.

11 Dr. Stark, I am going to ask you just a few questions to
12 be able to go over your testimony here and your prior
13 declarations.

14 As you heard earlier with respect to your qualifications,
15 as to election security, you spoke to your experience with the
16 Election Assistance Commission; correct?

17 **A.** Yes, sir.

18 **Q.** And election security conference; correct?

19 **A.** Two conferences for roughly six years, yes, sir.

20 **Q.** And you spoke to advising Secretaries of State as well; is
21 that correct?

22 **A.** Yes, sir.

23 **Q.** Now, how much of that advising and participation was
24 rooted in risk-limiting audits as opposed to cybersecurity and
25 mechanics of actual machines?

1 **A.** Things are blended together to some extent because the way
2 to attain an evidence-based election, despite whatever cyber
3 vulnerabilities the system might have, necessarily involve
4 paper.

5 I'm a coauthor on a number of papers on end-to-end
6 cryptographically verifiable voting systems, including being on
7 the development team for the STAR-Vote system for Travis
8 County, Texas.

9 I have advised on issues related to paper flow issues
10 related to cross-checking electronic results against other
11 systems of record, including voter registration databases and
12 ballot tracking systems.

13 So it is a mix of a bunch of things. But issues around
14 cybersecurity, paper, and auditing are all commingled.

15 **Q.** And they all refer back to your expertise of risk-limiting
16 audits; correct?

17 **A.** That is not the foundation of it. It is through the
18 development of risk-limiting audits and the work that I have
19 done initially for the California Secretary of State, but I
20 became familiar with the underlying issues and gained exposure
21 to larger issues around the conduct of elections through
22 working closely with state and local election officials,
23 including lots of time on the ground looking at paper flow and
24 procedures and security procedures including physical security
25 procedures in election offices.

1 Q. And you believe that experience qualifies you to the
2 fields of human behavioral factors and human memory and
3 attention?

4 A. My experience around human and behavioral factors
5 experience and attention is partly through participating in the
6 design of the STAR-Vote system working closely with two human
7 factors experts.

8 Q. You yourself are not a human factors expert; correct?

9 A. I am not a human factors expert.

10 Q. You relied on the expertise of other people with the
11 expertise in that field; correct?

12 A. For what purpose? I'm sorry. I don't understand the
13 question.

14 Q. Well, to the extent that the human factors molded into the
15 concept of the STAR-Vote system, you were not the human factors
16 expert? You were relying on the opinions of others I believe
17 is what you just said; right?

18 A. I was not the human factors expert for the development of
19 the STAR-Vote system. That is correct.

20 Q. Okay. And so when you testify about voters review their
21 ballots, those are based on what, I think you will agree with
22 me, to be human factor-related observation; right?

23 A. I am relying -- for the numbers that I quoted, I'm relying
24 on two articles, one of which was by actually some human
25 factors experts I worked with on the STAR-Vote system, the team

1 from Rice, and the other by Alex Halderman, Matt Bernard, and
2 others from the University of Michigan.

3 **(Unintelligible cross-talk)**

4 MR. BROWN: I object. Please let him finish.

5 **A.** With regard to issues around human memory, attention, and
6 the ability to remember long lists of things, I'm relying in
7 part on my experience teaching undergraduate and graduate
8 students for more than three decades now and what I have seen
9 in testing and the work that I have done developing
10 graphical-user interfaces and online systems for online
11 education.

12 **Q. (BY MR. MILLER)** But you didn't conduct those studies
13 yourself; right?

14 **A.** I did not conduct those two studies. That is correct.

15 **Q.** And the team at Rice you are referring to, would that
16 include Dr. Byrne?

17 **A.** Yes, sir.

18 **Q.** Michael Byrne?

19 **A.** Yes.

20 **Q.** Okay. With respect to hand-marked paper ballots, have you
21 conducted any research as to the rate at which voters verify
22 hand-marked paper ballots?

23 **A.** I have not.

24 **Q.** Okay. And why is that?

25 **A.** Again, the human factors is not my particular area of

1 study. I'm not aware of any studies on the rate at which
2 voters do verify hand-marked paper ballots.

3 The issue here I believe is not the rate at which voters
4 either make mistakes or correct their own mistakes. The issue
5 is the distinction between a voter being responsible for his or
6 her own work and a voter being responsible for errors
7 introduced by the electronic technology.

8 MR. MILLER: If I can, I'll pull up what will be a
9 defense exhibit.

10 And, Your Honor, just because of the quick time line,
11 we have not shared this as well. But we can quickly email it.

12 THE COURT: If plaintiffs would also email your
13 documents -- your demonstrative to the defendants.

14 MR. BROWN: Yes, Your Honor.

15 THE COURT: Just remember I don't have it. We'll
16 deal with all what I don't have later.

17 **Q.** (BY MR. MILLER) Dr. Stark, can you see your screen now?

18 **A.** Yes, sir.

19 **Q.** Okay. Can you read that?

20 **A.** The New York Times, Florida Recount Senate Votes Yet Again
21 and Nelson's Chances Dwindle.

22 **Q.** Okay.

23 **A.** Shall I go ahead and read the article?

24 **Q.** No. I apologize. I, frankly, meant in terms of can you
25 read the text on the screen. But that is all fine as well.

1 **A.** It is not an eye test.

2 **Q.** Sure.

3 So, Dr. Stark, I believe you just mentioned a minute ago
4 that you hadn't found the voter's intent relevant to a
5 hand-marked paper ballot but instead were concerned that it
6 reflect the voter's vote or mark.

7 Is that approximately correct?

8 THE COURT: I'm sorry. I'm sorry. Mr. Miller, you
9 are getting more remote again.

10 MR. MILLER: I apologize. Can you hear me now, Your
11 Honor?

12 THE COURT: I'm having trouble seeing you. I guess
13 the --

14 MR. MILLER: Your Honor, I think right now --

15 THE COURT: Right now you are there.

16 MR. MILLER: Can you hear me now?

17 THE COURT: Yes. And I can see you now.

18 MR. MILLER: Okay. Thank you.

19 THE COURT: Though I see Ms. Welch, but I'm not
20 sure --

21 MR. MILLER: I'm sorry, Ms. Welch. I don't intend to
22 leave it up for too long. I apologize.

23 **Q. (BY MR. MILLER)** So, Dr. Stark, to go back to my prior
24 question there, I believe you were just testifying to the
25 extent that for a hand-marked paper ballot voter verifiability

1 is less of a concern because you are talking about whether the
2 voter properly marked it; is that right?

3 **A.** No, sir. That isn't an accurate reflection of my -- at
4 least what I intended to say.

5 **Q.** Please correct me.

6 **A.** Whether a voter verifies his or her hand-marked paper
7 ballot is up to the voter. And if a voter makes a mistake and
8 doesn't correct that mistake, that is on the voter on some
9 level.

10 In contrast, a voter can check a review screen on a
11 ballot-marking device or listen to the audio output of a
12 ballot-marking device. And yet what gets printed on the
13 printout isn't necessarily what the voter saw, what the voter
14 heard, or what the voter did. What is on a hand-marked paper
15 ballot is necessarily what the voter did.

16 **Q.** Okay. And I believe I understand your --

17 THE COURT: Could you just take down the Florida
18 recount because it is not helping our -- what we're trying to
19 see here.

20 MR. MILLER: Your Honor, if I could have the witness
21 read one sentence off of this.

22 THE COURT: You just read it. Read it aloud what you
23 -- there is no point in --

24 MR. MILLER: Okay.

25 THE COURT: Read what you want to ask him about.

1 MR. MILLER: Yes, Your Honor. I understand.

2 **Q.** (BY MR. MILLER) So, Dr. Stark, for that purpose, as to
3 the first contention, are you aware of the senate race in
4 Florida between Bill Nelson and Rick Scott?

5 **A.** Yes.

6 **Q.** And in that contest, do you understand the concern around
7 ballot design and a voter's vote on those ballots? Are you
8 aware of that?

9 **A.** I'm aware generally that ballot design, whether it is a
10 printed ballot or a ballot-marking device screen layout, can
11 greatly affect the rate at which voters make errors.

12 **Q.** And so specific to this instance here from this article --
13 and I'll read it to you -- Broward County was unusual in that
14 it had reported more than 30,400 of undercount ballots. They
15 were not miscounted -- excuse me -- if they were not
16 miscounted, then the most likely explanation was that they
17 were, in fact, left blank, possibly because of the way the
18 ballot was designed.

19 Do you understand that?

20 **A.** I heard what you said. Yes, sir.

21 **Q.** And do you believe this has any effect on your contention
22 that hand-marked paper ballots are essentially without fault in
23 the risk-limiting audit concept?

24 **A.** I'm sorry. I don't understand the question. Voters can
25 make mistakes whether they are using a hand-marked paper ballot

1 or a ballot-marking device. Poorly designed ballot layouts,
2 whether they are on screen or on paper, can increase the rate
3 at which voters make mistakes in marking their ballots.

4 But the difference is that if a voter left a contest blank
5 on a hand-marked paper ballot we know that the voter actually
6 left the contest blank on the hand-marked paper ballot, whether
7 it was deliberate or not. Whereas for a ballot-marking device
8 printout, if the contest is blank, we don't know whether that
9 is because of malware, voter error, or design or something
10 else.

11 **Q.** Well, I guess the question really boils down to your
12 concept of the voter's intent in leaving the ballot blank. So
13 it is your contention that a poorly designed ballot which
14 results in an undercount -- that a voter in that situation
15 should have no recourse? Should be upset only at themselves?

16 **A.** I'm sorry. If a ballot is poorly designed, that is a
17 problem. Ballot design should be reviewed before the election
18 to be checked for usability.

19 There are good guidelines on how to design hand-marked
20 paper ballots and on-screen ballots as well. I'm not sure what
21 you are getting at.

22 The risk-limiting audit can't get at what is in the
23 voter's mind. All it can look at is what the voter did if it
24 is a hand-marked paper ballot or what the machine did if it is
25 a ballot-marking device printout.

1 Q. That is precisely what I was getting at, Dr. Stark. Thank
2 you.

3 And, secondarily, in terms of audits generally, you stated
4 in your declaration that you had invented the risk-limiting
5 audit; correct?

6 A. Yes, sir.

7 Q. Am I correct in that being in the beginning of 2007?

8 A. Yes, sir.

9 Q. Okay. And following that invention, you agree that the
10 Election Assistance Commission extensively piloted this
11 concept; right?

12 A. The Election Assistance Commission provided support to the
13 States of California and Colorado for those states to conduct
14 pilots. Some pilots were conducted without funding from the
15 EAC. Some were conducted with money from the EAC.

16 Q. And in terms of piloting an audit, no audit just flips on
17 at the flick of a switch; correct?

18 A. I don't understand your question. But, first, the
19 number --

20 Q. Let me rephrase that. So in terms of the question is:
21 When you implement a risk-limiting audit, would it be your
22 opinion that you flip it on at the turn of a switch without
23 piloting and testing the proper processes and procedures?

24 A. Again, I don't understand the question. If the question
25 is whether the audits that were conducted that I'm calling

1 pilot audits genuinely fulfilled all the criteria of being
2 risk-limiting, I can speak to that. If there is an issue --

3 **(Unintelligible cross-talk)**

4 **Q. (BY MR. MILLER)** Dr. Stark, when you move forward to
5 implement a risk-limiting audit, say, in Colorado, for
6 example -- okay? -- would you suggest the State of Colorado
7 wholesale implement a risk-limiting audit without ever having
8 done it before and without piloting the concept?

9 **A.** There are a lot of moving pieces to conducting a statewide
10 risk-limiting audit. Conducting a jurisdictionwide
11 risk-limiting audit is a lot simpler. And many of the audits
12 that I'm calling pilot audits were genuine risk-limiting
13 audits.

14 Working out the regulatory framework and the legislative
15 framework for conducting binding risk-limiting audits clearly
16 takes some time. There are logistical aspects of how each
17 jurisdiction handles its paper, keep tracks of its paper,
18 organizes its paper, deals with chain of custody, and so forth
19 that need to be addressed. Those are not simple questions.

20 It is certainly a great way to get one's feet wet to
21 conduct pilots that are not binding, that are not under as much
22 pressure as a risk-limiting audit that has the legal
23 possibility of changing the outcome of an election would
24 require.

25 So I think pilots are terrific. I also think that with

1 good planning and help a jurisdiction could immediately move --
2 could move to conducting risk-limiting audits in one or more
3 contests either within jurisdictions or statewide on a couple
4 of months' notice.

5 **Q.** And did you think that the State of Colorado had that kind
6 of help when they were implementing the audit regime?

7 **A.** The State of Colorado had help from me, help from a number
8 of other election integrity advocates, help from, I think,
9 Colorado League of Women Voters.

10 Initially, there was no legal mandates to risk-limiting
11 audits. So things could only be done on a pilot basis. I'm
12 not sure how to answer your question.

13 **Q.** And, of course, the statewide risk-limiting audit as a
14 binding matter didn't come to fruition until 2017; is that
15 correct?

16 **A.** That's correct.

17 **Q.** And you are also aware that Colorado utilizes central
18 tabulation for their ballots; right?

19 **A.** Yes, sir.

20 **Q.** And so that all ballots are scanned through the central
21 count scanner, not through precinct scanners in various
22 counties?

23 **A.** There may be still some legacy systems that differ from
24 that. But I believe that their now uniform voting system
25 generally is central count optical scanner, that they are

1 largely a vote-by-mail state.

2 **Q.** Do you believe an RLA is effective on central scanning?

3 COURT REPORTER: I'm sorry. Can you repeat that?

4 **Q.** **(BY MR. MILLER)** Do you believe a risk-limiting audit is
5 effective in a central scanning jurisdiction?

6 **A.** Again, it depends on how it is conducted. I'm not sure
7 what you mean by effective. If the underlying paper trail is
8 trustworthy, if there has been a compliance audit to confirm
9 that the underlying paper trail was trustworthy, then a
10 risk-limiting audit, you know, will have a known minimum
11 probability of catching and correcting outcome-changing errors.

12 **Q.** And so I believe you mentioned earlier that you did not
13 believe that an audit -- a risk-limiting audit could ever be
14 effective on a ballot-marking device system; is that correct?

15 **A.** There is no audit procedure that can be conducted on the
16 output of ballot-marking devices to confirm that the outcome of
17 a contest is correct in the sense that it reflects what the
18 voters actually did on the BMD or saw on the screen or heard
19 through the audio.

20 The sense in which a risk-limiting audit may still be
21 worth doing is that it can catch -- it can detect whether
22 errors in the tabulation of a particular pile of ballots was
23 large enough to alter the reported outcome of one or more
24 contests.

25 But what it can't do is determine whether that particular

1 pile of paper is a trustworthy representation of what voters
2 did, saw, or heard.

3 **Q.** And do you believe a risk-limiting audit could be
4 conducted on, say, a DRE machine?

5 **A.** No -- well, again, a paperless DRE, absolutely not. A DRE
6 that prints a VVPAT, you could use the VVPAT as the basis for
7 an audit. It would have the same faults of using a BMD
8 printout as the basis for an audit would have. Namely, there
9 is little reason to believe that what is printed by the device
10 reflects what the voter did.

11 **Q.** And, of course, you engaged in an audit of that nature;
12 correct?

13 **A.** I have done a pilot audit that used the printout from --
14 the DRE printout in Orange County, yes, sir.

15 **Q.** And you did that in India as well; correct?

16 **A.** No, sir.

17 **Q.** Explain -- well, I apologize. In terms of the election
18 machine -- the electronic voting machine, are those similar to
19 a DRE that is used in India?

20 **A.** Yes. They have a -- they have a simple -- I actually
21 haven't seen one. I recall seeing photos of them. But they
22 have some kind of simple interface, and they print -- they
23 print a record. I think a single candidate or a single party.

24 **Q.** And so on that machine the vote is recorded inside the
25 machine; right?

1 **A.** Yes, sir.

2 **Q.** Okay. And the paper is not recorded --

3 **(Unintelligible colloquy)**

4 THE COURT: Whoever is speaking has to remember that
5 you are going to be sharing your voice and your remarks with
6 everybody else in the court. Thank you. Be careful.

7 Go ahead.

8 **Q.** **(BY MR. MILLER)** And so, Dr. Stark, in those instances,
9 the what you referred to as a VVPAT, which I take to mean a
10 voter verifiable paper audit trail, that was not a vote of
11 record; correct?

12 **A.** I'm sorry. That was not a --

13 **Q.** In the context of India, the printout that came on with
14 the EVMs was not a vote of record; correct?

15 **A.** I don't know Indian electoral law well enough to know
16 whether they considered the printout to be the vote of record
17 or the electronic record to be the vote of record.

18 **Q.** Let me put it this way: When tabulating, the machine is
19 tabulating the vote in the machine and it is not tabulating
20 anything on paper; correct?

21 **A.** That is correct.

22 **Q.** Okay. So you conducted an audit on these machines in
23 India; right?

24 **A.** No, sir, I did not.

25 **Q.** You wrote a paper on it?

1 **A.** I wrote a paper about a method for auditing electoral
2 systems like that used in India. I did not conduct any audit
3 in India. I have not been involved in the conduct of any audit
4 in India.

5 **Q.** And so do you believe this audit in India was a --

6 THE COURT: All right. I think -- I'm sorry. We are
7 really going far afield. If he was not, in fact, conducting
8 the audit in India, I mean --

9 MR. MILLER: Your Honor, we are trying to share a
10 screen here to see if this is referring to some published work
11 of Dr. Stark.

12 **A.** There has been no audit in India.

13 **Q.** (BY MR. MILLER) There has been no audit in India? Did I
14 hear that correctly?

15 **A.** Yes, sir.

16 **Q.** And you wrote this paper about concepts of auditing then;
17 is that right?

18 **A.** Yes, sir.

19 **Q.** Okay. So I believe you used the term security theater
20 before when you --

21 (Unintelligible cross-talk)

22 THE COURT: All right. I would like you to remove
23 the document. The thing about -- the reason why I'm trying to
24 get you to remove documents -- anyone, not you personally
25 necessarily -- is that unless the person -- we have to have our

1 attention drawn to it, then I can't -- then I can't see you and
2 I can't hear as well.

3 MR. MILLER: Yes, Your Honor. I understand. I
4 wanted to make sure that Dr. Stark and I were on the same page
5 as the study we're talking about.

6 **Q. (BY MR. MILLER)** But you are familiar with that study
7 we're referencing, Dr. Stark; correct?

8 **A.** I'm not sure I would call it a study. It is a research
9 paper. It introduces a mathematical method for auditing a
10 different electoral system from that that we use in the United
11 States.

12 I do believe that if an audit were based on, in essence,
13 the VVPAT output, it would have the same problems that it would
14 in the United States. Perhaps not quite as bad for a number of
15 reasons. The primary one being that what is reflected on the
16 paper printout is basically a single candidate or party, if I
17 understand correctly. It is not like checking a list of 29 or
18 30 different selections in different contests. It is a single
19 item being printed.

20 I think the cognitive load involvement verifying that is
21 much smaller. However, I don't know what procedures are in
22 India and how they vary from jurisdiction to jurisdiction
23 within India regarding what happens if a voter contests that
24 the printout doesn't match the button that the voter pushed on
25 the screen.

1 Q. And you're not aware of those procedures in Georgia
2 either, are you?

3 A. Excuse me?

4 Q. You are not aware of those procedures in Georgia either,
5 are you?

6 A. No, sir. I understand informally that if a voter requests
7 another opportunity to mark a ballot the voter is legally
8 entitled to. But I'm not even sure that that is correct in
9 Georgia.

10 Q. Okay. And you talked about hypothetical voters who might
11 have an issue and raise it and be ignored; is that right?

12 A. No, sir. I said that the poll worker or election official
13 would be in a bind if a voter raises an issue because the
14 options that are available to the election official or poll
15 worker are very limited, aside from allowing the voter an
16 opportunity to mark a new vote.

17 If you take a voter's claim that the machine misbehaved at
18 face value, you are faced with -- the only option is to do the
19 election over again. And if you don't give it any credence,
20 well, then an election could be -- the election result could be
21 incorrect because of malfunctions of the equipment.

22 Q. But you have --

23 **(Unintelligible cross-talk)**

24 A. There is no good option.

25 Q. -- to voter.

1 MR. BROWN: Objection, Your Honor. He was not
2 finished with his answer. Again, we have --

3 MR. MILLER: Your Honor, I'm not trying to cut off
4 the witness. But at some point this is a cross-examination
5 with yes-or-no questions and not (unintelligible). I realize
6 we are on Zoom, and I'm not trying to be difficult.

7 THE COURT: Let Professor Stark finish the answer if
8 he hasn't.

9 THE WITNESS: Thank you, Your Honor. I actually
10 don't remember what I was going to say.

11 THE COURT: All right. Go ahead, Mr. Miller.

12 **Q. (BY MR. MILLER)** On the exhibit you discussed in your
13 direct testimony, you referred to a hack rate; correct?

14 **A.** Yes, sir.

15 **Q.** And just to be clear, that document was not produced in
16 discovery; right?

17 **A.** That's correct.

18 **Q.** Was that document cited and included in your declaration?

19 **A.** No, sir.

20 **Q.** And so on those hack rates, you mentioned earlier you are
21 unaware of any study as to hand-marked paper ballot
22 verifiability.

23 How did you determine the hack rate relative to, say,
24 50 percent of hand-marked paper ballots in your hypothetical?

25 **A.** In the hypothetical involving 50 percent hand-marked paper

1 ballots, the only votes that were changed were votes that were
2 printed using ballot-marking devices. And I assume that there
3 was no change to votes made on hand-marked ballots.

4 **Q.** So you just assumed that there was no issue with a
5 hand-marked paper ballot; right?

6 **A.** No, sir. I assumed that electronic hacking can't change a
7 hand-marked paper ballot.

8 **Q.** And would you agree with me that a hack with a pencil or
9 pen could change a hand-marked paper ballot?

10 **A.** If there isn't a good chain of custody of ballots, if
11 insiders can alter marks on ballots, then there is a problem,
12 whether it is hand-marked paper ballot or ballot-marking device
13 output.

14 **Q.** And that chain of custody becomes even more difficult when
15 there is central tabulating scanners; correct?

16 THE COURT: When they are essential what?

17 MR. MILLER: I'm sorry. Central tabulating scanners.
18 Central count scanners, for example, in Colorado.

19 **A.** I don't see why that would be the case.

20 **Q.** **(BY MR. MILLER)** And when the voter is not him or herself
21 inserting the ballot into the scanner?

22 **A.** I don't think that that cuts one way rather than the
23 other. The chain of custody of the ballots matters regardless
24 of where the ballots are collected.

25 **Q.** And you have a couple of comments in the -- in your

1 declaration regarding the Fulton County pilot audit.

2 And just real briefly, you do understand that is a pilot;
3 correct?

4 **A.** It clearly was a pilot, but it was not represented as a
5 pilot by the Secretary of State's office.

6 **Q.** Would you agree with me that a press release is not the
7 equivalent of binding state policy?

8 **A.** Sir, obviously, it is not binding state policy. But it
9 was completely misleading. It said that it was a risk-limiting
10 audit. It said that it could catch and correct errors. It
11 said it validated the results. It said it followed best
12 practices established by experts in election integrity. And it
13 was none of those things.

14 **Q.** It was an example of trying to learn and work out the
15 kinks of implementing best practices? Would you agree with me
16 on that?

17 THE COURT: I really don't think this is helpful. I
18 mean, you are arguing with the witness about an article -- an
19 article about, I guess, the Secretary of State's office --

20 MR. MILLER: Your Honor, if I may, this is contained
21 in his declaration.

22 THE COURT: I understand that. But I don't think it
23 is going to materially make a difference to me. That is what
24 I'm trying to tell you.

25 MR. MILLER: Your Honor, one last subject matter here

1 and I'll be done.

2 **Q.** (BY MR. MILLER) And I would ask that we put the screen
3 share back on briefly.

4 Dr. Stark, can you see this on your screen?

5 **A.** Yes, sir.

6 **Q.** Okay. And do you see your name there at the top in the CC
7 line?

8 **A.** I do.

9 **Q.** Okay. I just want to ask you just a few general
10 questions.

11 Who is David Dill?

12 **A.** David Dill is a computer scientist formerly at Stanford
13 University. He has gone to Facebook from Stanford. He was the
14 founder of Verified Voting Foundation.

15 **Q.** And am I correct in assuming the other individuals on the
16 email are associated with Verified Voting?

17 **A.** That would not be correct. It is true of some of them but
18 not all of them.

19 **Q.** I understand. And so you yourself, Dr. Stark, are you
20 affiliated with Verified Voting?

21 **A.** No longer. I was on the advisory board for some years,
22 and I was on the board of directors for some years, and I
23 resigned last year.

24 **Q.** And how about Barbara Simmons? Do you know if she is
25 affiliated with Verified Voting?

1 **A.** Yes. Dr. Simons is the chair of the board of Verified
2 Voting.

3 **Q.** I apologize. Thank you for correcting me on her name.
4 Mr. Favorito, is he affiliated with Verified Voting?

5 **A.** Not to the best of my knowledge.

6 THE COURT: Tell me where you are going, Mr. Miller,
7 because right now you have gone longer than Mr. Brown. So just
8 tell me where you are going with this and how much longer are
9 you going to be.

10 MR. MILLER: Your Honor, the point as to this
11 exhibit, which is the only piece of evidence that was produced
12 in discovery, is that it demonstrates a disagreement, frankly,
13 within the organization as to what a risk-limiting audit is.
14 And it includes plaintiffs in this case.

15 THE COURT: Ask him a point-blank question rather
16 than -- why are we going through each of the individuals. If
17 you want to ask him, let him read the document and ask him a
18 question about it or else --

19 MR. MILLER: Yes, Your Honor. I guess the basis is
20 to form the foundation on the individuals listed here. I will
21 just ask him about two other individuals on this email chain if
22 that is okay.

23 THE COURT: Two. I mean, I just don't really see the
24 point. But that is -- I'm not going to restrict you. But I'm
25 telling you at this point, you know, you have one minute to

1 wrap up.

2 MR. MILLER: Yes, Your Honor.

3 **Q. (BY MR. MILLER)** Dr. Stark, Ms. Donna Curling is on this
4 email chain too; correct?

5 **A.** Yes, sir.

6 **Q.** And Ms. Marilyn Marks is on this email chain too; correct?

7 **A.** Yes -- yes, sir.

8 **Q.** Okay. And so if I could point you here to the email from
9 Ms. Simons to Ms. Marks. And we'll scroll down here to Curling
10 1000 -- excuse me -- 10019.

11 Do you recognize these emails from around Christmas of
12 last year?

13 **A.** Give me a moment to orient myself.

14 **(There was a brief pause in the proceedings.)**

15 **A.** Yes. I have read it now.

16 **Q. (BY MR. MILLER)** And do you recall this conversation?

17 **A.** Yes.

18 **Q.** And would you agree with my assessment that this is an
19 internal discussion and dispute as to whether RLAs are, in
20 fact, RLAs on a ballot-marking device?

21 **A.** Internal to what?

22 **Q.** To Verified Voting or I should say just interested
23 parties.

24 **A.** It is not internal to Verified Voting. There are a number
25 of parties who are not affiliated with Verified Voting,

1 including by that time me.

2 I mean, the president of Verified Voting, Marian
3 Schneider, had made some public comments which actually
4 triggered my resignation. And this enunciated position is
5 still not consistent with what I intend risk-limiting audit to
6 mean and what it is supposed to accomplish.

7 I think that this is part of the reason that Verified
8 Voting and I parted ways. Although they have come closer to my
9 position since I left.

10 **Q.** I'm sorry. And I take that to mean they still don't agree
11 with your position now?

12 **A.** There are still some published materials that contradict
13 my position. Although I understand from Dr. Simons that that
14 was not their intent.

15 **Q.** And would you agree that Verified Voting is generally a
16 specialized group focusing on as aspects like RLAs and voting
17 machines; right?

18 **A.** Verified Voting originally was primarily concerned with
19 internet voting and then electronic voting more generally.

20 In the last few years, they have been focusing primarily
21 on risk-limiting audits. Yes.

22 **Q.** And would you agree with me that reasonable people can
23 disagree and reasonable experts in the field can disagree as to
24 what constitutes effective RLAs?

25 **A.** No, sir. I think that anyone who disagrees with me on

1 this point is unreasonable.

2 **Q.** So any other individual that disagrees with you is
3 unreasonable? But you have the exact testimony; right?

4 **A.** Well, on this particular issue, I did come up with the
5 idea. The whole principle that it is supposed to fulfill, the
6 whole point of the audit is that it has a large chance of
7 correcting the reported outcome if the reported outcome is
8 wrong. And everything flows from that.

9 So some people are trying to redefine it so that it only
10 corrects some kinds of errors, so that it is fine to do it even
11 on an untrustworthy paper trail. I don't think that that is
12 the spirit of it. That is certainly not what I intended it to
13 be. That is not what the papers say.

14 **MR. MILLER:** Thank you, Your Honor. No further
15 questions.

16 **THE COURT:** Mr. Brown, do you have anything more?

17 **MR. BROWN:** I have one follow-up question.

18 **REDIRECT EXAMINATION**

19 **BY MR. BROWN:**

20 **Q.** Dr. Stark, putting aside your risk-limiting audit for the
21 moment, do you know of any audit no matter how well conducted
22 that could confirm this upcoming election in Georgia is
23 accurate if Georgia does not replace the BMDs?

24 **A.** No, sir. There is no pre-election, during the election,
25 or post-election process that can check whether BMDs altered

1 votes -- enough votes to change the outcome of the contest,
2 even if the resulting paper were tabulated perfectly.

3 MR. BROWN: Thank you, sir.

4 THE COURT: All right. Let me just ask you one
5 question, Dr. Stark.

6 EXAMINATION

7 BY THE COURT:

8 **Q.** When you were responding to the last questions that
9 Mr. Miller was making about whether you found it -- whether you
10 were right, whether they were right, I want to make sure I
11 understand this. I mean, you had -- when you developed the
12 concepts and principles of a risk-limiting audit, you indicated
13 that this was a -- basically a whole paradigm development and
14 construct of how it was done and you did this sort of as a
15 mathematician and as a scientist, if I understand your prior
16 affidavits and your resumes? Is that basically a fair summary,
17 or am I missing something?

18 **A.** I apologize, Your Honor. But I didn't quite understand
19 the question.

20 **Q.** All right. Well, my understanding -- I'm just looking --
21 was that you are an expert on statistics, on mathematics, and
22 you developed -- and that you developed the whole concept of
23 principles around risk-limiting audits.

24 And is that correct?

25 **A.** Yes, Your Honor.

1 **Q.** All right. And so when you were responding to Mr. Miller,
2 if I understand what your testimony was, is that from your
3 perspective as the kind of creator and author of risk-limiting
4 audits that you -- that paradigm that you don't find that these
5 are acceptable modifications? Is that a fair summary?

6 **A.** Yes, Your Honor. That the weakening of the concept
7 destroys the fundamental property that the audit has the -- has
8 a large chance of correcting the outcome if the outcome is
9 wrong.

10 I should say that I didn't develop this in a vacuum. This
11 started with work I did for the California Secretary of State
12 then Debra Bowen, who as part of her platform promised to
13 review the voting systems that had been deployed in California
14 and see whether they should be recertified or decertified.

15 She also pulled together a working group for post-election
16 audit standards. I was named to be on that working group. And
17 it was after reviewing what California and other states were
18 actually doing, reviewing the academic literature on auditing
19 that I was left dissatisfied with the state of the art and
20 spent some months trying to figure out what might work better.

21 And so it is from that practical application within the
22 context of an assignment from the California Secretary of State
23 that I developed risk-limiting audits.

24 **Q.** If I understand correctly, your focus is developing a
25 methodology that would allow you to catch systemic errors

1 that -- so that you could validate the election results
2 ultimately and correct processes that were lending themselves
3 to lack of integrity in the data?

4 **A.** Your Honor, I apologize for talking on top of you. The --
5 this flows from the fundamental question of what would we like
6 an audit to be able to do or what would we like auditing to
7 accomplish. And it seemed like at a bare minimum we would like
8 an audit -- we would like to know that when we are done with
9 the audit we have high confidence that the reported winners
10 really won. And so everything flows from that.

11 We are never going to get tallies exactly right. But in
12 contrast to financial matters, when it comes to elections,
13 there is a nice bright line for materiality. I decided to
14 treat an error as material if it changed the electoral outcome,
15 if it changed who won.

16 So instead of worrying about every last vote, this is kind
17 of a minimum standard to say we should at least ensure that
18 everything that happened was accurate enough to determine who
19 won. And so this is a procedure that relies on a trustworthy
20 paper trail -- and there are separate ways of establishing
21 whether the paper trail is trustworthy -- and uses that paper
22 trail to ensure that if the reported winner did not really win
23 there is a large chance of catching that incorrect ending.

24 THE COURT: All right. Thank you very much. We're
25 going to take -- it is 3:04. I have been keeping everyone's

1 time. And I took the last five minutes. The State, as I said,
2 took more than the plaintiffs. Just watch it because I'm -- I
3 am watching the time myself. We're going to take a five-minute
4 break and then resume.

5 Thank you very much. It is now 3:05. We will resume
6 at 3:10.

7 **(A brief break was taken at 3:05 P.M.)**

8 THE COURT: Plaintiffs' counsel, when we sometimes
9 have an echo, it is helpful to separately just turn off the
10 audio and to be speaking into the phone if I remember correctly
11 from that one evidentiary hearing we had with all the people at
12 different sites.

13 MS. ASCARRUNZ: Is this any better?

14 THE COURT: That's better. All right.

15 MS. ASCARRUNZ: I apologize.

16 THE COURT: All right. That is fine.

17 So you are calling Dr. Halderman next. All right.

18 COURTROOM DEPUTY CLERK: Dr. Halderman, if you would
19 please raise your right hand.

20 **(Witness sworn)**

21 COURTROOM DEPUTY CLERK: Thank you. Please state
22 your name and spell your last name for the record.

23 THE WITNESS: My name is Alex Halderman. That is
24 H-A-L-D-E-R-M-A-N.

25 Can you hear me all right?

1 THE COURT: Yes.

2 THE WITNESS: Thank you, Your Honor.

3 Whereupon,

4 J. ALEX HALDERMAN, PH.D.,

5 after having been first duly sworn, testified as follows:

6 DIRECT EXAMINATION

7 BY MS. ASCARRUNZ:

8 **Q.** Perfect. Good afternoon, Dr. Halderman. Given that the
9 Court is familiar with your credentials and has previously
10 accepted you as an expert in computer science specializing in
11 election security, I won't go through your entire credentials
12 and we can jump right into it unless the Court has any
13 questions.

14 THE COURT: Go ahead.

15 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, you testified last year
16 regarding the State's DRE and EMS system.

17 What did you do for purposes of the hearing today?

18 **A.** Well, we have been busy. I have been conducting forensic
19 reviews of the FBI's image of the Center for Election Systems
20 server at Kennesaw State. I have been examining DRE system
21 memory cards and internal memory images from a set of DREs that
22 have been provided to us.

23 I have -- as of last Friday, we got access to equipment
24 from the new system. And so I have been analyzing the BMD and
25 optical scanner system as well.

1 Q. And we can hear you, but it is a little bit soft. If you
2 can speak up or move closer to the mic, that would be helpful.

3 A. Is this any better?

4 THE COURT: Well, it is good. It is now loud for me.
5 But that is okay.

6 THE WITNESS: I'm sorry.

7 THE COURT: No. That is all right. Everyone else
8 needs to hear.

9 Q. (BY MS. ASCARRUNZ) Okay. So, Dr. Halderman, you said
10 that this weekend you started to do some work on analyzing as
11 well.

12 Could you explain what you did in that regard.

13 MR. TYSON: Your Honor, excuse me. Pardon me. I'll
14 just object here. The information for Dr. Halderman's analysis
15 of the Dominion system under this Court's order -- any
16 information he gained from it was protected by the protective
17 order in this case.

18 So I believe that we would need to close the
19 courtroom to hear the results of his analysis from that given
20 the issues raised in Dominion in this Court's order.

21 THE COURT: Well, this was precisely what I tried to
22 raise with you-all yesterday and everyone said we can handle
23 it. So I'm kind of -- no one said, oh, we're going to have to
24 have a separate proceeding.

25 MS. ASCARRUNZ: Your Honor, from our perspective, the

1 analysis that Dr. Halderman did was of material that is
2 publicly obviously visible and available to voters and others
3 during an election cycle. This particular set was given to
4 him -- access was given to him obviously in the context of this
5 case.

6 So we don't -- you know, the analysis that he did was
7 not particularly privy to any source code material or anything
8 along those lines or that nature.

9 THE COURT: All right. Well, I'm going to allow him
10 to begin. Mr. Tyson, you can renew your objection. I'll be
11 very sensitive to it. And I know that we did discuss this
12 issue so that if we -- if plaintiffs' counsel think we are
13 suddenly also -- that you are in a bad spot I would prefer to
14 have Mr. -- Dr. Halderman then speak at the end of the hearing
15 because then at least we can do anything else that is a public
16 matter then and then we could have a separate -- we can adjourn
17 and I can basically then hear his testimony towards the end.

18 MS. ASCARRUNZ: Thank you, Your Honor.

19 THE WITNESS: I will endeavor not to reveal technical
20 details that would (unintelligible) --

21 COURT REPORTER: There is some sort of -- I'm having
22 trouble understanding Dr. Halderman.

23 THE WITNESS: I hear a hum in the background.

24 THE COURT: I do too. What happens when you speak
25 again?

1 THE WITNESS: Let me try it. Can you hear me now?

2 THE COURT: Yes.

3 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, I think we were
4 discussing --

5 THE COURT: I really think that it is coming from
6 counsel's office because when you speak then we get that hum
7 again.

8 MS. ASCARRUNZ: I'll make sure to mute it when
9 Dr. Halderman is speaking. That may help.

10 THE COURT: All right.

11 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, with respect to the
12 analysis of the BMD materials and the equipment, what did you
13 analyze?

14 **A.** I analyzed the ballot-marking device itself and the
15 accompanying optical scanner that was provided from Fulton
16 County. Of course, this is just the beginning of the analysis.
17 We have only had the equipment since Friday afternoon.

18 **Q.** And were there any particular issues you are trying to
19 resolve or questions that you wanted answered?

20 **A.** Yes.

21 So the hum is back. I'm sorry.

22 THE COURT: Counsel, are you calling from your
23 Washington office or some -- a different office? Are you
24 with --

25 MS. ASCARRUNZ: Yes.

1 THE COURT: Surely there is somebody there who can
2 try to deal with the hums in there. It is like we have this
3 constant -- it is not more than a hum. It is higher.

4 Can you hear it yourself?

5 MS. ASCARRUNZ: We don't hear it here. We are
6 working on it to try to resolve it as we go through. It seemed
7 fine a little while ago.

8 THE WITNESS: Perhaps if counsel could mute the
9 microphone in Zoom while I'm giving my answer.

10 THE COURT: Can you do that?

11 MS. ASCARRUNZ: I have been doing that when
12 Dr. Halderman is speaking.

13 COURT REPORTER: Now she is muted.

14 THE COURT: I can't hear you now.

15 MS. ASCARRUNZ: I'm sorry about that. I was saying
16 we have been muting it over here on this end when Dr. Halderman
17 is speaking. But the hum is still going across on the end.

18 Can you hear me?

19 THE COURT: Yeah. Just proceed for now.

20 Are you able to hear the question, Dr. Halderman?

21 THE WITNESS: Could you repeat the question, please.

22 **Q. (BY MS. ASCARRUNZ)** I have lost track of it. But I think
23 the question was: What specific questions or issues were you
24 trying to resolve in your review of the system?

25 **A.** Well, so the initial review I have been doing has been a

1 form of penetration testing. I'm looking for attacks that
2 could be executed against the system, ways that attackers could
3 get information out of it, even simple things that an adversary
4 could do to try to forge votes.

5 **Q.** And what were you able to find?

6 **A.** Quite a lot actually, given the amount of time. We were
7 able to construct -- we were able to construct an end-to end
8 demonstration of one particular attack. And it was able to
9 find, quote, a number of different -- a number of different
10 avenues that an attacker could use to do even more damage.

11 Overall, the analysis so far has further confirmed my
12 existing impression based on studies performed in other states
13 that there is significant vulnerabilities in the Dominion
14 system.

15 **Q.** Let's get down to specifics. You mentioned an end-to-end
16 demonstration of an attack. What is that?

17 MR. TYSON: Your Honor, at this point, I'll renew my
18 objection in terms of whatever Dr. Halderman is about to speak
19 to. It is going to be from the information he learned in this
20 process of his review that the Court allowed.

21 His demonstration is to discuss something that has
22 not been tested by both experts, that has not -- is subject to
23 the protective order. So we will renew our objection to this
24 being done in open court.

25 THE COURT: What does plaintiffs' counsel have to

1 say?

2 MS. ASCARRUNZ: Your Honor, we believe, as I said
3 before, that this was information gleaned from equipment that
4 is visible to the public and available to the public.

5 Dr. Halderman did not review or look at any
6 proprietary information that was produced by the defendant.
7 That being the case, there is some material within his
8 testimony that we can cover that is not arguably within the
9 scope of any protective order. And I think Dr. Halderman
10 already committed to not revealing any technologically, you
11 know, sensitive information.

12 THE COURT: All right. What I think we should do is
13 -- unless Dr. Halderman is about to leave -- needs to leave for
14 some urgent appointment we should defer him -- his testimony to
15 a little later in the afternoon. And then he can -- you can
16 begin in the public while we have a public connection. And he
17 can testify about anything that is safely not confidential.
18 And then we can go off and resume ourselves privately.

19 MS. ASCARRUNZ: That is fine. Thank you, Your Honor.

20 THE COURT: All right.

21 MS. ASCARRUNZ: Dr. Halderman --

22 THE COURT: Go ahead.

23 **Q. (BY MS. ASCARRUNZ)** Dr. Halderman, we will set aside for
24 now the analysis that you did over the weekend and go through
25 some of the other issues that you had analyzed in this case.

1 Did you review --

2 THE COURT: Let me ask you this: What I was trying
3 to say is -- I mean, is he your last witness for the day?

4 MS. ASCARRUNZ: No, he is not, Your Honor.

5 THE COURT: So what I'm saying that would make better
6 sense, unless there is some foundation -- existential
7 foundation, why can't we just wait and let Dr. Halderman
8 talk -- begin his testimony later? And we'll have a continuity
9 rather than having him come and then somebody else and then him
10 coming back.

11 MR. CROSS: Sorry, Your Honor. This is David Cross.
12 The next witnesses, I think, are going to run into the same
13 issue, Mr. Hursti, maybe Ms. Dufort. So I don't know if --
14 from our perspective, this is the same as the hack that he did
15 to the DRE in the courtroom, which was public. It is the same
16 style of presentation.

17 He is not going to get into the specifics of how it
18 is done other than at a high level. So nothing technical.
19 There was no objection when we did that before, and that was
20 the system used.

21 So it is the same approach. But we are going to have
22 the same issue because the next two witnesses are going to talk
23 about the same equipment.

24 MR. TYSON: Your Honor, from the State defendants'
25 perspective, I mean, obviously the plaintiffs would not have

1 had access to this equipment without the Court's order allowing
2 it. It is not something that has been shared with us so that
3 we know what is going to be done here.

4 But to have someone who -- like Dr. Halderman who has
5 been found by the court in Pennsylvania in *Stein vs. Boockvar*
6 that he acted more as an advocate than an expert to demonstrate
7 something that may or may not be what it appears to be and for
8 which we have had no opportunity to test or see if it is what
9 it says it is, especially in the current environment regarding
10 the legitimacy of elections, this is definitely at least
11 information related to the security of voting systems covered
12 under the protective order.

13 I just -- I don't see that there is a reason why this
14 needs to be carried out in open court, given the issues and
15 given the stage of this case where we have had no opportunity
16 to test or even address whatever it is Dr. Halderman is about
17 to show. I don't know what that is because I haven't seen it
18 and it has not been shared with us.

19 THE COURT: I'm just trying to understand to move
20 forward because I'm -- A, I really think you should avoid the
21 attacks on any witness at this juncture. Secondly, I'm willing
22 to consider that if that is his testimony. But I was trying to
23 get to issues that were with him basically testifying in a way
24 that it would be more seamless. So really basically plaintiffs
25 just -- you picked up -- somehow you didn't hear what I was

1 saying.

2 But you are telling me that Dr. Hursti has the same
3 issue? That he was also looking at the documents at the -- all
4 right. Well, then what --

5 MR. CROSS: Well, Your Honor --

6 THE COURT: What we need to do then -- I'm sorry.

7 MR. CROSS: I understand. I'm sorry.

8 THE COURT: What we need to do is take a five -- a
9 ten-minute recess then again and let me talk to you-all on the
10 phone because I can't -- first of all, there is this hum
11 that -- Mr. Cross, that somebody has to deal with in the firm.
12 And because it is just -- it is going to drive us crazy.

13 And, secondly, I would like to understand what is
14 coming up next in the testimony and presentation. Of course,
15 there is a strong degree of interest in elections. I
16 understand the State's interest in basically not -- in having
17 the electorate feel confident about the electoral processes.

18 But there is also strong interest in openness about
19 this. So this is -- but I don't know what is coming up. So it
20 is really very difficult for me to manage from afar. So I
21 think just -- I'm very sorry to the public that we are jumping
22 up and down and we are having these problems. And it is
23 obviously to some extent a function of Zoom and some of the
24 sensitivity of the subject matter and my allowing this matter
25 to proceed at this -- at this time, which I think I also had an

1 obligation to do.

2 But, anyway, it is 3:30, and we'll -- we have the
3 telephone number we have been using to have phone conferences,
4 Counsel?

5 MR. TYSON: Yes, Your Honor.

6 MR. CROSS: Yes, Your Honor.

7 THE COURT: All right. Mr. Brown, do you have it
8 too?

9 MR. BROWN: I'll get it, Your Honor. Thank you.

10 THE COURT: All right.

11 All right. Mr. Martin, could you just establish that
12 line? And we'll all get on that -- anyone who is counsel.

13 COURTROOM DEPUTY CLERK: I'm going to put this on
14 hold, and I will open that right now.

15 THE COURT: Thank you very much. I appreciate it and
16 anyone who is -- anyone who is on this Zoom line, please mute
17 yourself and we will get back to you shortly.

18 **(Whereupon, the transcript continues with the**
19 **parties, counsel, and the Court speaking on a**
20 **telephone conference, as follows:)**

21 THE COURT: [REDACTED]

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MR. CROSS:

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MR. TYSON: [REDACTED]

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MR. TYSON:

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MR. MILLER:

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MR. BROWN: [REDACTED]

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1 MR. TYSON: [REDACTED]

2 MR. CROSS: [REDACTED]

3 (The telephone conference proceedings were
4 thereby concluded at 4:05 P.M. and all parties
5 returned back to the Zoom conference.)

6 THE COURT: Are we ready to switch out witnesses?
7 And I will explain to those who are present what is going on.

8 MR. BROWN: Yes, Your Honor.

9 THE COURT: Is Mr. Hursti around?

10 MR. McGUIRE: He looks like he is on Page 2 of 5 as
11 far as the pictures.

12 THE COURT: Oh, hi. And do any of the geniuses here
13 have a way of getting him to be on Page 1?

14 COURT REPORTER: Maybe if he speaks, Judge.

15 COURTROOM DEPUTY CLERK: If he turns on his video, he
16 will appear.

17 THE COURT: So is everyone ready to begin at this
18 point?

19 MR. BROWN: Yes, Your Honor.

20 MR. CROSS: Yes, Your Honor.

21 THE COURT: Okay. Ladies and gentlemen who are
22 listening in as members of the public, I determined that -- at
23 least initially that I should hear Dr. Halderman's testimony in
24 a sealed proceeding basically in a -- at the conclusion of the
25 testimony today. And then I will determine whether or not any

1 portions of it can be released on the transcript and any of the
2 exhibits.

3 I will explain that the Court authorized plaintiffs
4 with their expert to examine the sample BMD and associated
5 equipment. And they had purchased also a printer as the one
6 that was being used in any voting site. But part of the
7 ability to do that was an agreement to keep information
8 regarding the operation of the BMD confidential and the
9 internal operation.

10 And the question really is whether the testimony is
11 going to be interfaced in such a way that that would make it
12 difficult. The plaintiff attempted to purchase a BMD on the
13 market but would not be sold one. So that was how we ended
14 up -- or they ended up in this position and I had to address on
15 one hand their access to the information and on the other hand
16 the State's interest in protecting confidentiality of the
17 internal processes for other security reasons.

18 And there were other issues as well. So not knowing
19 how the testimony is going to end up exactly and knowing that I
20 have still the option of making it available otherwise and not
21 wanting to hold this hearing up further, we discussed the other
22 witnesses' testimony. I think it was advisable that we start
23 other witnesses scheduled for today.

24 So is Dr. Hursti the next witness?

25 MR. McGUIRE: Yes, Your Honor. Mr. Hursti is ready

1 to be called.

2 THE COURT: All right. I see him now that he is
3 there. Thank you very much.

4 Mr. Hursti, thank you. You may go ahead. Just one
5 second.

6 Go ahead, Mr. Martin.

7 COURTROOM DEPUTY CLERK: Mr. Hursti, if you would
8 raise your right hand, please.

9 **(Witness sworn)**

10 COURTROOM DEPUTY CLERK: Thank you very much. If you
11 would please state your name and spell your last name for the
12 record.

13 THE WITNESS: Harri Hursti, H-U-R-S-T-I.

14 COURTROOM DEPUTY CLERK: Thank you.

15 Whereupon,

16 HARRI HURSTI,

17 after having been first duly sworn, testified as follows:

18 DIRECT EXAMINATION

19 BY MR. MCGUIRE:

20 **Q.** Mr. Hursti, just as the outset, have you had any access to
21 Fulton County election equipment that was produced on
22 September 4 pursuant to the Court's order and subject to the
23 confidentiality or the protective order?

24 **A.** I have not.

25 **Q.** Okay. Have you had access to any other discovery material

1 that has been produced in this case under a designation of
2 confidential or attorneys' eyes only?

3 **A.** I have not had access.

4 **Q.** Okay. Mr. Hursti, Mr. Halderman began to testify about
5 security of distributed components of the voting system. I
6 want to ask you about the security of the central components,
7 the system core, the EMS. I also want to ask you about how the
8 system records and tabulates votes.

9 I'm going to begin with your background. You have -- you
10 were -- the Court noted in August 2019 that you are a
11 nationally-recognized cyber expert. I would like to just talk
12 about your expertise in two different areas, voting system
13 security and ballot scanning.

14 First of all, on voting system security, can you tell us a
15 little bit about how you -- about your background in that area?

16 **A.** I was invited by election supervisor Ion Sancho back in
17 2005 to --

18 THE COURT: Speak a little more slowly -- all
19 right -- so that --

20 THE WITNESS: I'm sorry. English is my second
21 language.

22 THE COURT: No. That is quite all right. I have a
23 member of my family or did who had many different accents as
24 well. I understand. But I am trying to deal with a court
25 reporter who is trying to get everything down that you said.

1 **A.** So I was voluntarily invited by the election supervisor
2 Ion Sancho of Tallahassee, Florida, to examine the vote --

3 COURT REPORTER: Slow down, please.

4 THE COURT: You were invited by someone in
5 Tallahassee?

6 THE WITNESS: Yes. Tallahassee, Florida, by the
7 election supervisor Ion Sancho to examine --

8 THE COURT: We'll get the name later. The election
9 supervisor there in Tallahassee -- we'll get the name at the
10 conclusion. All right.

11 **A.** I will take the microphone here, so it is better
12 hopefully.

13 -- so to examine the system he was using. And
14 subsequently I have been part of a number of studies, most
15 notably a study commissioned by Secretary of State Ohio
16 Jennifer Brunner called EVEREST, which examined every single
17 voting system used in the State of Ohio.

18 That was one of the many studies. So I have been spending
19 15 years both in United States and overseas examining the
20 security properties of voting systems.

21 **Q. (BY MR. McGUIRE)** Thank you. Have you given testimony as
22 well before any presidential commissions?

23 **A.** Correct. I was invited by the Presidential Advisory
24 Commission on Election Integrity also called Pence-Kobach
25 Commission to testify about election security properties.

1 Q. And are you involved in any -- in any professional or
2 interest group conferences related to security?

3 A. Yes. I am a cofounder and co-organizer of the Voting
4 Machine Hacking Village at DEF CON. DEF CON is one of the
5 oldest and largest security community and hacker conferences in
6 the world, which attracted in 2019 when we were last time in
7 person 30,000 people to be present in Las Vegas.

8 Q. And in the course of your DEF CON conference, have you
9 ever looked at or examined BMD-type devices?

10 A. Yes, I have. We have been looking on eBay and government
11 surplus stores and bought everything what we find. So yes, we
12 have had BMD-type of devices, the first device being AutoMARK
13 Device.

14 COURT REPORTER: A what kind of device?

15 THE WITNESS: AutoMARK. It is a brand name.

16 THE COURT: AutoMARK, could you spell it for us.

17 THE WITNESS: A-U-T-O-M-A-R-K.

18 THE COURT: Thank you.

19 Q. **(BY MR. McGUIRE)** I would also like -- I also understand
20 you have an expertise in ballot scanning.

21 Can you talk about your background in that?

22 A. Back in 2005 when I started, one of the first things I
23 realized is that I need to build an open source software to
24 examine ballots. So I started both building a system how to
25 scan ballots and then process images. Eventually that system

1 has been used to process images, which I have not produced
2 myself.

3 So I have an expertise both how to examine images and also
4 how to examine images produced by others. Also I have a
5 background in computer graphics as well. So I have been
6 leveraging my knowledge about digital imaging technologies in
7 order to have a quick start in ballot images.

8 **Q.** And have you participated in any audits that deal with
9 ballot scanning software?

10 **A.** One of the public pilots we did was Arapahoe County which
11 is outside of Denver, Colorado, where we conducted multiple
12 different ways of risk-limiting audits. One of those involved
13 reimagining the images. That was a republican primary of summer
14 of 2014.

15 MR. MCGUIRE: Your Honor, I would like to -- I can go
16 into more detail. But in the interest of time, I would like to
17 tender Mr. Hursti as an expert in two things, voting system
18 cybersecurity and ballot scanning, and then ask him some
19 questions about that in those areas.

20 MR. TYSON: Your Honor, we would have no objection to
21 the ballot scanning part of Mr. Hursti's expertise. I will
22 want to ask him some more questions about the cybersecurity
23 issues, specifically related to Dominion. We would object to
24 that, but I understand I can cover that in cross.

25 THE COURT: All right. That is fine. I think that

1 is certainly enough of a showing that he could proceed.

2 MR. McGUIRE: Thank you.

3 **Q.** (BY MR. McGUIRE) So, Mr. Hursti, you have given four
4 declarations in this case; correct?

5 **A.** Correct.

6 **Q.** Okay. I want to talk about the ones that you gave in late
7 August and September of this year. Specifically in your
8 declaration of August 24, which was Document 809-3 on the
9 docket, you talked about two investigations you had conducted.
10 One is June 9 where you were a poll watcher. The other is
11 August 11 when you did a Rule 34 inspection in Fulton County.
12 I want to cover those.

13 First of all, June 9. What did you do on June 9?

14 **A.** On June 9, we traveled across different precincts on
15 election day. The day before election day, I went to the
16 Atlanta Congress Center, whatever was that where the absentee
17 ballot, mail-in ballot process was, observing the equipment
18 from across from the room of what equipment they had, how they
19 processed, how the processes worked. And then after the
20 election day, observing the precincts, I went to English Street
21 to observe from the observation area how the election night
22 tallying and the information acquisition started.

23 **Q.** Okay. Thank you. And so in the course of your June 9
24 observations, you saw test ballots being printed; is that
25 right?

1 **A.** So in that area in one of the locations, the ballot
2 marking -- I arrived to the location because there was a report
3 that there was irregularities in the ballot-marking device
4 operations. I was told that the ballot-marking device produces
5 test ballots.

6 And while I was observing, I saw a voter who went to scan
7 their ballot. The poll worker -- after the machine rejected
8 multiple times, the poll -- he sent the -- told that this is a
9 test ballot. The voter went back with the test ballot and
10 picked up the real ballot and returned the test ballot into the
11 tray. So I observed that, and I didn't see the ballot, but I
12 believe that the poll worker when -- when the poll worker said
13 that this is a test ballot.

14 **Q.** So you detailed that in other observations in your
15 declaration; correct?

16 **A.** Correct.

17 **Q.** Okay. As far as your August 11 visit to Fulton County
18 election center, are your observations in your declaration --
19 does that substantially capture what you saw that day as well?

20 **A.** Correct.

21 **Q.** Okay. So, Mr. Hursti, I want to ask you: Based on your
22 expertise and based on what you observed, the things that you
23 have detailed in your declarations, do you have an opinion
24 about whether the Dominion voting system using BMDs is capable
25 of producing an accountable election result?

1 **A.** Taking into account that I, as I detailed in the
2 declarations, saw multiple different kinds of irregularities
3 and an unexplained behavior, there is a serious doubt that the
4 system was operating correctly. And in a theoretical level, as
5 detailed already by Professor Stark, when you don't have an
6 end-to-end chain of the voter's intent, when there is a system
7 which can either maliciously or by honest error reproduce wrong
8 kind of evidence, you don't have a capability of auditing.

9 **Q.** Okay. So without a capability of auditing, can you trust
10 the election results coming -- and without the chain of custody
11 and other issues you have described, you know, can you trust
12 the results coming out of the Dominion voting system?

13 **A.** I personally would say I cannot trust it. And also this
14 is not an election-specific issue. Any other industry, any
15 other system with similar faults in those same areas would be
16 equally untrustworthy.

17 **Q.** Okay. In your opinion, specifically looking at this as an
18 election system, as a voting system, is there a solution to the
19 problem of the system's untrustworthiness?

20 **A.** Yes, I believe there are. Based on the fact -- fact and
21 observations and what I have gathered, the solution would be
22 two-fold: First, moving to the hand-marked paper ballots. And
23 in the case of a precinct in-person voting, the deficiencies of
24 that scanner can be overcome by instructing voter carefully to
25 vote and providing a pen, which will be known to be recorded

1 well by the scanner, what would be a black felt pen so that it
2 gives no reflection. And at the same time, in home voting and
3 email voting -- home voting and mail-in voting, the solution
4 would be to use already existing scanners with more efficient
5 way producing a higher quality, more information, retaining
6 files to be used.

7 **Q.** Okay. So let me just break that down. Are you suggesting
8 the continued use of the BMDs?

9 **A.** I am not suggesting the continued use of BMDs. I am
10 strongly recommending to go to the hand-marked paper ballots
11 for the reasons being that when the system in between cannot be
12 trusted the chain of custody is broken.

13 **Q.** Okay. Let me ask you a question about scanners. Do you
14 have an opinion whether the Dominion system's precinct and high
15 volume scanners, the two different kinds of scanners, can be
16 relied upon to accurately count all the votes?

17 **A.** Not at this current type of settings and the way they
18 operate.

19 **Q.** Is that no, you don't have an opinion or no, they can't be
20 trusted?

21 **A.** No, they can't be trusted under the current configuration
22 and how they are currently being used.

23 **Q.** Okay. So is there a solution to that problem for the
24 precinct scanners?

25 **A.** Yes, there is a solution. As I stated before, my opinion,

1 the relief for the deficiencies of the system would be
2 carefully instructing voters how to fill the oval and enforce
3 use of a proper marking device, so using a black felt pen,
4 which that scanner seems to be very much liking and recognizing
5 more accurately than other kinds of pens.

6 **Q.** Okay. And as far as the high volume scanners that are
7 used to scan all the mail ballots, is there a solution to their
8 unreliability at counting votes?

9 **A.** Yes, I believe there is. That scanner is far more capable
10 than the precinct scanner. So that device can be configured to
11 capture higher quality and more information retaining images.
12 So instead of using a bilevel black or white capture images
13 which contain more information, for example, color or gray
14 scale images. And also that scanner is natively having higher
15 resolution than what is used to capture today.

16 **Q.** Okay. So I'm going to try and cover all that in the time
17 we have left. Let me just jump quickly to the security issue,
18 which dealt with whether the system can be trusted.

19 In your declaration, you talked about the system -- the
20 central system not being hardened. What do you mean by
21 hardening a system?

22 **A.** Hardening is the standard basic security practice under
23 the well-accepted principle that a general purpose device when
24 used with a lot of software for different purposes is more
25 vulnerable than a limited system which has all the minimum

1 necessary to accomplish the task. So it is just really using a
2 general purpose machine via single purpose machine. This is by
3 eliminating and removing all unnecessary software, removing all
4 unnecessary services, and removing all unnecessary drivers to
5 make it the bare bone minimum needed for the task. And that is
6 by reducing using the attack surface making it inherently more
7 secure.

8 **Q.** And based on what you have seen in your observations, has
9 the attack surface on the Fulton and other county servers been
10 reduced?

11 **A.** It has not been reduced. It is visibly obvious just
12 seeing in the start menus the icons of software which
13 absolutely doesn't have any role in election system. But also
14 in the examination of or inspection of the system in Cherokee
15 County and the information they produced show that to be the
16 case beyond any kind of question because they produced
17 information of all programs running, all services running, all
18 drivers running, and software installed. And that list is
19 comprehensively proving that the system has been not hardened.

20 Also the manager of election system there -- I'm sorry.
21 I'm dyslexic. He also outright stated to me that he -- his
22 understanding also is that system has not been hardened.

23 **Q.** Okay. I would like to show you what is marked as P --
24 Exhibit PX 4, if they can pull that up on the screen. If not,
25 I'll share my screen. Let me see if we have got anyone able to

1 do that. So can we widen that so the focus is on the screen?

2 So, Mr. Hursti, you said visibly -- you said the lack of
3 hardening was visible. Is this an example of that?

4 **A.** This is very much example of that. It is very much
5 visible that there are a number of computer game symbols on the
6 screen, and it is irrelevant whether those are installers or
7 can be highjacked the game itself. And any hardening would
8 remove all of this to be visible and remove all remains of that
9 from the system.

10 **Q.** So -- and I'm sorry. You said those were computer games?

11 **A.** That is correct. Some of those games are very much
12 recognizable, especially the bald gentleman on the bottom left
13 corner. That game is Homescapes from a Russian gaming company
14 where that Russian gaming company has been over times -- a
15 number of times under scrutiny about their business practices
16 and also the companion software and so-to-speak alleged spyware
17 that is spread with their games --

18 **Q.** And what election server is this we're looking at here?

19 **A.** This is a -- it is labeled underneath the monitor. This
20 is in Fulton County on the right-hand side of the central
21 tabulator rack. This is one of the client computers which this
22 part of the computer was used to upload the early voting vote
23 at the time when I arrived to the polling location on the
24 election night.

25 **Q.** Okay. I would like to pull up next Exhibit PX 5. And if

1 you can enlarge that as well, if possible.

2 Mr. Hursti, is this -- is this a similar example or
3 something different?

4 **A.** This is a similar example. This is from Cherokee County.
5 And this is a Windows integral interface, which they also
6 produced showing that Microsoft probably used Xbox gaming
7 console accompanying software is installed. Definitely not
8 something that you need in an election system. And if
9 especially this is a companion software, which is intended to
10 be communicating, this is opening attack surfaces -- vulnerable
11 attack surfaces.

12 **Q.** Do you mean attack surfaces?

13 **A.** Yeah. Attack surfaces.

14 THE COURT: Surfaces, Ms. Welch.

15 **Q.** **(BY MR. MCGUIRE)** So in addition to what is installed on
16 the server, have you taken a look at any logs to try and find
17 out if these vulnerabilities have been exploited?

18 **A.** So we were provided by Fulton County a series of logs.
19 And one of the observations immediately was that from the
20 election night the security log is only 29 minutes long. It is
21 covering only a very short period of time, about 5:00 P.M.
22 to --

23 **Q.** Let me stop you there. Let me stop you there, and I'll
24 ask the technician to remove the exhibit. Can we replace that
25 exhibit with Exhibit 6 -- PX 6? I'm sorry. And can you widen

1 that, please?

2 So, Mr. Hursti, what are we looking at in PX 6?

3 **A.** We are looking at a Microsoft event viewer, which is
4 standard software to view all the logs of the system, viewing
5 application log, which was from Fulton County, provided when
6 Fulton County was asked to provide a log of the server. This
7 is the application log of that server in the viewer.

8 **Q.** Okay. And that blue line there, is that -- what is that
9 highlighting?

10 **A.** This is highlighting the fact that in this log, which is
11 application log, there is a significant gap of time from
12 6:59:34 A.M. to 3:52:31 P.M. where no log entries were present.
13 This is significant because if you see the previous days where
14 no election was conducted you had a previous day, which is
15 Monday 1561 log entries and on Sunday 1661 entries --

16 **THE COURT:** Slow down because if I'm having trouble
17 the court reporter is. So we have -- we are going to go over
18 this again. We have this day, which is I guess --

19 **THE WITNESS:** This is a log provided by Fulton
20 County.

21 **THE COURT:** Right. And what is the date? It is
22 6:59 A.M. in the morning? Is that what you are saying?

23 **THE WITNESS:** 6:59:34 in the morning on the 11th of
24 August --

25 **THE COURT:** All right.

1 THE WITNESS: -- which is the election day. So log
2 stops -- the application log stops at that point of time in the
3 morning of the election day, and it continues 3:52:31 P.M.
4 There are no log entries in between those.

5 THE COURT: All right. Go ahead.

6 **Q. (BY MR. McGUIRE)** Mr. Hursti, what would you have expected
7 to see on election day in a log of an election server in a
8 county that was conducting an election?

9 **A.** So, first of all, I compared this same period of time for
10 the day before and the day before that, so Sunday and Monday.
11 And I found that even when the election was not going on there
12 was 1561 log entries on the day before and 1661 log entries on
13 the same period of time on Sunday, which means that even if the
14 system is not used it will produce log entries.

15 Also, accompanied with this was a system log which shows
16 20 entries in this period of time spread over the whole period
17 of time showing that the system was up and running at the time.
18 So because of the election, I definitely would at least expect
19 to see the same amount of entries than what is the amount of
20 entries in the day when the election is not going, especially
21 because after the 3:00 P.M. when the log resumes on the gap
22 there is extremely -- there is a heightened amount of entries
23 from that period of time. So this gap -- it cannot be
24 explained.

25 **Q.** Okay. So, Mr. Hursti, we can go on and on like this. But

1 just in the interest of getting to the scanning portion, I just
2 want to ask you real quick just a single question.

3 In addition to hardening, is physical security something
4 that you have observed being a problem?

5 **A.** Physical security has been very much part of the problem.
6 In both locations, it is not because of any malicious. It is
7 just probably not training and instructing how physical
8 security should be conducted.

9 **Q.** So -- and that would include things like accessibility to
10 the equipment from unauthorized persons?

11 **A.** Correct. One of the very basic practices is that in order
12 for a system to be hardened physically all ports which are not
13 used in the computers are physically blocked or temporarily
14 blocked because the only thing -- this is an attack computer
15 made in U.S. costing \$99. You can take this and plug it in for
16 30 seconds to 60 seconds. That is all it takes to take over a
17 system. So --

18 **Q.** Let me stop you there. So you are holding up a USB stick;
19 is that right?

20 **A.** This looks like USB. It is a USB stick. But this is an
21 attack computer of its own freely available in the market, made
22 in America, designed in America.

23 **Q.** You just have to put that into an open port, and you can
24 take over a computer?

25 **A.** This can be programmed to carry out ultimate attacks.

1 There have been a number of times using this particular device
2 and assisted in the demonstration of how vulnerable systems are
3 if they are not physically protected.

4 The general purpose computer like what is used here is
5 consumer grade computer, cannot defend itself if physical
6 access is granted. And it is so quick -- the time period you
7 need to carry out, so on and so on.

8 **Q.** If there were an attack, would you expect to see evidence
9 in a log file?

10 **A.** If there would be attack, there should be some kind of
11 evidence there. Or the attack is sophisticated enough to
12 remove all evidence.

13 **Q.** So you would have missing log entries?

14 **A.** Missing log entries is a culprit of sophisticated attack.

15 **Q.** I would like to jump to scanning next. Now, there are two
16 types of scanners. There are central count scanners, and there
17 are precinct scanners, and I want to talk to you about both.

18 First, let's talk about the central count scanners. Tell
19 me -- tell me what your concerns are with the central count
20 scanners.

21 **A.** So the central count scanner -- the whole import of the
22 general purpose computers, general purpose scanner, cheap, low
23 quality, if you may, but no quality -- not that much quality is
24 needed in consumer product. So that is one part.

25 But second part is the way it is used because this is

1 really for the central count scanner it is like driving a
2 Porsche with the first gear blocked.

3 Sorry.

4 COURT REPORTER: Slow down, please. I am not
5 following you.

6 **A.** So the way the scanner is used in this environment is like
7 driving your sports car locked on the first gear. The scanner
8 itself is capable of producing a lot higher orders of magnitude
9 higher images than what it is currently doing.

10 **Q. (BY MR. McGUIRE)** So let me -- so let me see if I
11 understand.

12 What you are saying is that scanner is recording a lower
13 quality image than it is capable of?

14 **A.** That's correct.

15 **Q.** Okay. Why is it doing that?

16 **A.** The computers are doing exactly what they are asked to do.
17 So as part of the configuration, that scanner is instructed to
18 produce low quality images with a reduced amount of
19 information.

20 **Q.** Okay. I would like to show you Exhibit PX 7. I would
21 like to go to the second page and blow it up.

22 You know what? Hold on just a minute. So actually I'm
23 sorry. I mistook that. Let's look at the first page, but
24 let's blow it up. If we can scroll down to show the three
25 races that are on there.

1 So, Mr. Hursti, this is PX -- Exhibit PX 7. And are you
2 familiar with this -- what this is showing?

3 **A.** Yes, I am familiar with what this is showing.

4 **Q.** Can you tell the Court what we're looking at?

5 **A.** We are looking for a ballot image, which has reduced the
6 only white and black, no gray scales, and the ballot markings,
7 which the voter has conducted in the marking of this ballot.

8 **Q.** So these are real -- this is a real ballot that was
9 scanned in the central count scanner?

10 **A.** Correct.

11 **Q.** And these -- this is the image that the scanner recorded?

12 **A.** Correct.

13 **Q.** Okay. And you are saying that this is a lower quality
14 image than the scanner could have recorded?

15 **A.** Correct. Because this image is only 200 DPI, which is a
16 fraction of what the scanner is capable. Also, this scanner --
17 this image has been reduced to have only black or white pixels
18 based on algorithms and so-called business logic and the
19 scanner itself is capable of producing color images and gray
20 scale images.

21 **Q.** Okay. So now --

22 THE COURT: The scanner itself is capable of
23 producing what?

24 THE WITNESS: Color images and gray scale images.

25 THE COURT: Gray scale. All right. And you were --

1 the initials you used before, just so that the court reporter
2 gets it, was DBI or --

3 THE WITNESS: DPI, dots per inch.

4 THE COURT: Dots per inch. Okay. Thank you.

5 **Q. (BY MR. McGUIRE)** Mr. Hursti, that first race that says
6 district attorney of the Atlanta Judicial Circuit, do you see
7 that?

8 **A.** I do see that.

9 **Q.** And do you see the mark next to Fani Willis?

10 **A.** Yes, I do see that.

11 **Q.** Would you expect a scanner to be able to count that mark?

12 **A.** Certainly I would.

13 **Q.** Okay. Let's go to Page 2.

14 So, Mr. Hursti, what does Page 2 show?

15 **A.** Page 2 shows the software interpretation of what it saw on
16 the ballot.

17 **Q.** And so this is the Dominion's central count scanner's
18 interpretation of how to count the ballot we just saw?

19 **A.** Correct.

20 **Q.** And under that first race for district attorney of the
21 Atlanta Judicial Circuit, it says Fani Willis. That is what
22 you would have expected; correct?

23 **A.** Correct.

24 **Q.** And so let's go back to the previous page one more time
25 and scroll down to the race for sheriff.

1 And you see that very similar mark there, do you not?

2 **A.** Yes, I do see it.

3 **Q.** And that is a vote for Theodore Jackson?

4 **A.** I would say it is a vote.

5 **Q.** Let's go to Page 2. Now, under -- on that record there
6 where it says sheriff, it says blank contest. What does that
7 mean?

8 **A.** It means that the voting system did not record any vote
9 being cast by the voter.

10 **Q.** Is this expected behavior for a central count tabulator?

11 **A.** This is not expected behavior.

12 **Q.** Okay. How can you explain what we are seeing here?

13 **A.** What we are seeing here is that the scanner is reducing
14 all information to either black or white and that
15 predetermination tells what the image is recording.

16 And after that, a mathematical algorithm is applied which
17 is only blindly counting how many black and white pixels it
18 sees and based on that make a determination if there is a vote
19 or not.

20 So based on that reduced information, the system didn't
21 cross the threshold to see that as a vote or even as ambiguous
22 mark.

23 THE COURT: By ambiguous mark, you mean it didn't
24 reflect either an ambiguous mark or --

25 THE WITNESS: Or as a vote cast.

1 **Q.** (BY MR. McGUIRE) Just to drive home that, what would have
2 happened if it had been marked as an ambiguous?

3 **A.** Well, that would have meaning that the system sees
4 something, which it says that it is not clear whether it is
5 mark or not. And that would have then gone to the human
6 process. But in this case, the system didn't even see that
7 there would be a mark of requiring a human observation.

8 **Q.** I would like to take down this exhibit and put up Exhibit
9 PX 7-1 -- 7.1. So let's go to Page 2 of this one.

10 So, Mr. Hursti, do you recognize this exhibit?

11 **A.** Yes, I do recognize this exhibit.

12 **Q.** So what are we looking at in this one that is different
13 from the other exhibit?

14 **A.** So these are not ballots which have been marked by a real
15 voter. These are test ballots, which we marked with various
16 type of colors of pens and various of ways to see what the
17 scanner is recognizing as a vote and what it is not recognizing
18 as a vote.

19 **Q.** And this was done not on a central count scanner but on a
20 precinct scanner; correct?

21 **A.** That is correct.

22 **Q.** Okay. Why do we see two different ballots?

23 **A.** Well, we see two different ballots because they are
24 produced by two different resolutions and qualities, which is
25 obvious from two different things. First of all, on the

1 right-hand side, you don't see any of the ovals even. So
2 even --

3 THE COURT: Ovals? You don't see any of the ovals
4 that you would circle in? Is that what you are saying?

5 THE WITNESS: Correct. The vote targets which are
6 signified as an oval -- this is on the left side -- have
7 disappeared on the right-hand side. The barcode on top
8 right-hand corner is a blur to the extent that most of these
9 barcodes can't be any more recognized and interpreted because
10 of the low quality.

11 And also more -- very importantly, if you observe the
12 text under the date, you see that the text is not evenly
13 recognized from left to right. Instead, it is disappearing on
14 the right-hand side. All of these are hallmarks of bad quality
15 scanning and bad quality technology.

16 **Q. (BY MR. McGUIRE)** Okay. And let's go to the next page.
17 And here you have a colored mark.

18 Is this showing the same thing?

19 **A.** Again --

20 THE COURT: When you say the next page, which page
21 are you talking about?

22 MR. McGUIRE: I believe we should be on Page 3, Your
23 Honor?

24 THE COURT: Okay. Thank you.

25 **A.** So this is underlining the fact why a scanning or either

1 in color or a gray scale is required because the business logic
2 of converting -- the scanner itself is seeing everything in
3 color. And then there is a business logic in removing the
4 color to make it black and white.

5 So when the red marking is not meeting that threshold
6 value and in this case of the IPC scanner, there are other
7 things which are typical in nature, meaning the color of the
8 light that is used to illuminate the ballot, it doesn't capture
9 those marks at all.

10 **Q. (BY MR. McGUIRE)** So if a voter -- the voter would vote on
11 the image on the far left, and the scanner ultimately winds up
12 tabulating the image that is on the right; is that correct?

13 **A.** Correct.

14 THE COURT: This is the top right here? Because I
15 have got two ballots.

16 MR. McGUIRE: And then the smaller --

17 THE COURT: I just want to make sure I'm looking at
18 the right thing. You are examining --

19 MR. McGUIRE: Yes, Your Honor. There is a ballot on
20 the left and a ballot in the middle. And then on the right,
21 the top right, there is an interpretation.

22 THE COURT: Okay.

23 THE WITNESS: So those are two images of the same
24 physical piece of paper. It is a common misconception that the
25 scanner is taking picture of the paper. Scanner is not a

1 camera. Scanner is analyzing the paper and producing an image
2 what the scanner software thinks the human wants to see.

3 It is very different than trying to be accurate
4 representation of the original piece of paper.

5 **Q. (BY MR. McGUIRE)** Okay. And so this is the precinct
6 scanner, not the central count scanner; correct?

7 **A.** On the right-hand side, that is the precinct scanner.

8 **Q.** Okay. So is there a solution to this problem with the
9 precinct scanners?

10 **A.** So for a precinct scanner, as it is very clear here, it is
11 not as sensitive as the left-hand side scanner. The solution
12 is to use -- instruct the voters carefully to fill the whole
13 oval and provide them a pen -- black pen which is not
14 reflecting because the precinct scanner is more sensitive to
15 that color and that combination than anything else. So it is
16 more likely that the voter intent is accurately recorded.

17 THE COURT: I just want to -- for the record want to
18 make sure that we're talking about the same document. This is
19 a -- this is a provisional ballot that -- absentee/provisional
20 ballot or emergency ballot that a voter filled out at the
21 precinct because I gather there was some reason they couldn't
22 vote on the machine at that point?

23 THE WITNESS: This is a test ballot, which we filled
24 in order to both find out what are the limitations of the
25 scanner and also in this case demonstrate what are the

1 deficiencies. Because we filled 28 ballots, which were
2 accepted by the scanner with a significantly high error margin
3 of votes not being recorded from the ballots by the precinct
4 scanner.

5 **Q. (BY MR. McGUIRE)** So just to narrow that down, Mr. Hursti,
6 this is not a ballot that was used in an actual election;
7 correct?

8 **A.** Correct.

9 **Q.** This is a ballot that you filled out to test the
10 scanner -- the precinct scanner?

11 **A.** This is -- yeah. This is a ballot -- which this
12 particular ballot was not filled by me. But the sole purpose
13 of filling this out was to test what are the limitation of the
14 scanner. This is not a real vote from real election.

15 **Q.** Okay. And have you had an opportunity to look at actual
16 ballot images from a precinct scanner?

17 **A.** So we have been trying to get the actual images, but we
18 have been not getting the real images. And that is why the
19 only thing we can show in the precinct scanners are the test
20 images we made -- the test ballots which we created ourselves
21 that were run through the scanner.

22 **Q.** Finally, just to wrap this up, as between the precinct
23 scanner and the central count scanner, I understand that you
24 are proposing a different solution for the central count
25 scanners; is that right?

1 **A.** That is right.

2 **Q.** Okay. What is that solution?

3 **A.** The solution for a central count scanner is to allow that
4 scanner to capture the images with a higher resolution and
5 higher amount of information, meaning either color or gray
6 scale images. And since the standard of that kind of scanner
7 in office use is 300 DPI, which is obviously higher than 200
8 DPI here, just letting the current minimum standard of office
9 technology to be used.

10 **Q.** Okay. We can take the exhibit down.

11 So my last question for you, Mr. Hursti, is: Given what
12 you have seen of these scanners, in your opinion, are all votes
13 being counted by the current Dominion system?

14 **A.** We have been looking into different examples and
15 examinations. I don't believe all of the votes are being
16 counted.

17 MR. McGUIRE: Okay. Thank you. I have no further
18 questions except on maybe redirect, Your Honor.

19 THE COURT: Are you offering these exhibits into
20 evidence?

21 MR. McGUIRE: Yes. Yes. We would like to offer all
22 of these exhibits, 4, 5, 6, 7, and 7.1.

23 MR. TYSON: And we have no objection, Your Honor.

24 THE COURT: Okay. Later on, we should go back and
25 make sure if there are exhibits that were introduced in any of

1 the other witnesses that we address them. They are admitted.

2 MR. McGUIRE: Thank you.

3 MR. TYSON: Your Honor, are you ready for me to
4 proceed with cross?

5 THE COURT: Yes, I am.

6 CROSS-EXAMINATION

7 BY MR. TYSON:

8 **Q.** Mr. Hursti, good to see you again. I am Bryan Tyson. I
9 represent the State defendants. We met in Athens a few weeks
10 ago.

11 I just have some questions for you to walk through this.
12 But I want to start with: You personally believe that
13 hand-marked paper ballots is the best way to conduct an
14 election; correct?

15 **A.** Correct.

16 **Q.** And you personally believe that having paper pollbook
17 backups is the only or is the best way to conduct an election;
18 correct?

19 **A.** Correct. Because the current pollbook systems have been
20 demonstrably error-prone and they are not ready for prime time.

21 **Q.** You have stated that in your declarations, but that is not
22 based on any review you have undertaken of the Poll Pads? That
23 is based only on your observations from a public vantage point;
24 correct?

25 **A.** I am involved -- the Secretary of State of New Hampshire

1 examined these very same pollbooks. So yes, it is observation
2 but also in my other work for Secretary of State New Hampshire.

3 **Q.** Mr. Hursti, you don't have any specialized training or
4 experience in the administration of elections; correct?

5 **A.** Correct.

6 **Q.** And your training and experience, I believe, as we
7 discussed is focused on cybersecurity; right?

8 **A.** Cybersecurity and election security. Yes.

9 **Q.** And so when did you first personally examine a Dominion
10 BMD, or have you examined a Dominion BMD personally?

11 **A.** I acquired a -- the BMD ICP hybrid machine, which is a
12 ballot-marking device, different model from the Dominion than
13 that one, in 2017. And so I have been 2017 starting to examine
14 that ballot-marking device from Dominion.

15 **Q.** But you have not personally examined any of the Dominion
16 system that is currently used in Georgia except for the ICP; is
17 that correct?

18 **A.** I have not examined even the ICP used in Georgia. Not
19 ballot-marking device. Not the ICP.

20 **Q.** You mentioned earlier that you were involved in the
21 creation of the DEF CON Voting Village. Do you recall that?

22 **A.** I am a cofounder and co-organizer, correct.

23 **Q.** And are you aware of the criticism of the Voting Village
24 by the Department of Homeland Security because it gives access
25 that is not real world conditions for researchers?

1 **A.** I am not aware of the Department of Homeland Security --
2 the Department of Homeland Security giving that kind of
3 criticism. I am aware of general criticism from other sources
4 than the Department of Homeland Security.

5 **Q.** And you are being paid as an expert for the Coalition for
6 Good Governance; is that correct?

7 **A.** Correct.

8 **Q.** In your review and preparation of your declarations, did
9 you ever review Georgia State Election Board rules regarding
10 the storage of and access to components of the voting system?

11 **A.** I have cursory reviewed that. But I'm not certain how
12 accurate are the ones which are posted to the wall of the
13 Fulton County Election Preparation Center. So I have been only
14 examining the ones which are posted on the wall there.

15 **Q.** And so do you know for sure whether Georgia has specific
16 rules about the EMS and other components of the system being
17 connected to the internet?

18 **A.** I am not a law expert. I'm not a lawyer. I don't declare
19 to be that. So I'm not aware of the specific rules and
20 regulations in that area.

21 **Q.** And you concluded in, I believe, your December 2019
22 declaration that it was probable that a system like Georgia's
23 Dominion system would be targeted.

24 Do you recall that testimony?

25 **A.** Yes, I recall the testimony. And in the time of -- the

1 term where we are, all election systems are likely to be
2 targeted.

3 **Q.** And you are basing that probable statement not based on
4 actual knowledge of any hacking equipment that was actually
5 used in an election? You are basing it based on your
6 cybersecurity background; correct?

7 **A.** Cybersecurity background and also already published
8 studies, including the study which was published in DEF CON
9 Voting Village this summer which countries are targeting which
10 kind of systems and all. But it is not specific to any
11 specific location.

12 **Q.** But you are not aware of any hacking of voting equipment
13 that was actually used in an election -- correct? -- in
14 election conditions?

15 **A.** There are -- there is only anecdotal evidence of that.
16 And the reason is that all of the voting systems which have
17 been observed today in independent studies have one thing in
18 common. They don't record, preserve forensic evidence.

19 THE COURT: They don't preserve forensic evidence?
20 Is that what you said?

21 THE WITNESS: Yeah. Correct. The logs are not
22 protected, and they are very relaxed of capturing information
23 which would be required for forensic studies.

24 **Q. (BY MR. TYSON)** And it is your testimony that that is true
25 of all ballot-marking device systems?

1 **A.** I'm not making statement about ballot-marking devices.
2 I'm making statement about voting systems in general. And I'm
3 not making this statement specifically about Dominion. As I
4 say, all the systems have been independently studied. Dominion
5 system has not been independently studied because it has never
6 been submitted as a whole system to any independent studies.

7 THE COURT: I'm sorry. Just to make sure, it has
8 never submitted itself to an independent study?

9 THE WITNESS: No Secretary of State has so far
10 conducted the studies like the Secretary of State Ohio and
11 Secretary of State California where Dominion system would have
12 been part of the study.

13 **Q. (BY MR. TYSON)** And so, Mr. Hursti, just so I understand,
14 it is your testimony that the California system that reviewed
15 another version of the Dominion system -- your criticism is it
16 didn't review the version in use in Georgia; is that correct?

17 **A.** So my criticism here is that the last California conducted
18 independent study was conducted in 2007, which is called
19 California Top-to-Bottom Review. And no Dominion system was
20 part of that study.

21 **Q.** And Dr. Halderman in his declarations relies on SLI study
22 of Dominion BMD's system more recently in California.

23 Are you aware of that study?

24 **A.** I have browsed through a SLI study, which is posted in the
25 EAC website. I'm not aware of exactly the study, but I have

1 browsed through the study which is in the website. There is
2 actually multiple studies for different versions of the
3 Dominion Suite -- Democracy Suite software package.

4 **Q.** And are you aware of the study of the Democracy Suite 5.5
5 conducted in Pennsylvania by SLI and another study by Pro V&V
6 as well on security?

7 **A.** I have not read the study provided to Secretary of State
8 Pennsylvania. And also SLI is not independent study. It is a
9 volunteer guideline study based on -- paid by the vendor. So
10 that's not conducting an independent study as independent
11 studies are generally recognized in the security community.

12 **Q.** So it is your testimony that an EAC certified voting
13 system test lab, when it is conducting a security study, is not
14 an independent study of a voting system?

15 **A.** Independent study means that it is independent from the
16 voting system vendor. If the laboratory is paid by the vendor,
17 it is not independent study by the very definition.

18 **Q.** So just to clarify my question then, you would say if a
19 voting system vendor paid an EAC certified voting system test
20 laboratory for a security study you would not consider that an
21 independent study; correct?

22 **A.** Independent study is independent financially and by
23 control from the vendor. That is not independent study under
24 that definition.

25 I also would like to add that if you examine the Voluntary

1 Voting System Guidelines, it is very silent about security
2 properties. So, hence, that EAC study has very little -- very
3 little mandates with a real hardcore security study.

4 THE COURT: Hardcore what? I'm missing words. It
5 has little to do with a hardcore what type of study?

6 THE WITNESS: Security study. So the reason why
7 Secretaries of State like Jennifer Brunner of Ohio back then
8 and Debra Bowen of California back then -- why they wanted to
9 conduct independent studies is exactly to get rid of and to
10 have a study which is not by the current regulation paradigm.

11 **Q. (BY MR. TYSON)** Mr. Hursti, when you testified earlier
12 that you had examined the Fulton and Cherokee County EMS server
13 setups, are those the only two county EMS servers you
14 personally observed?

15 **A.** Yes. I have not touched them. I have been only observing
16 them. In the case of Cherokee, I was able to construct a
17 number of lines which the manager typed in. So I didn't touch
18 the machine.

19 **Q.** When Mr. McGuire was asking you about Plaintiffs'
20 Exhibit 4, you pointed out some various programs and icons that
21 were located on an EMS server.

22 Do you recall that testimony?

23 **A.** Correct.

24 **Q.** And do you know if the hardening process utilized by
25 Dominion removes the programs and the icons or just the

1 programs and leaves the icons in place?

2 **A.** So, first of all, if you are doing a hardening, you remove
3 both. And at the same time, based on the list of the output of
4 everything what we were able to get from Cherokee, that shows
5 that a lot of the programs are still there, a lot of the icons
6 are still there, and a lot of the services are still there,
7 things which would have been removed if the hardening had been
8 conducted.

9 **Q.** But you have not personally examined the EMS server to
10 conclude that all those are there? You are basing that on the
11 information you were able to gain from those reports and from
12 looking at those screens; correct?

13 **A.** Correct.

14 **Q.** You also testified that physical security was not
15 followed.

16 Was that in the Fulton County location or Cherokee or
17 somewhere else?

18 **A.** Both locations. Both in Fulton and in Cherokee.

19 **Q.** And I believe you testified already that you are not aware
20 of State Election Board regulations that mandate physical
21 security for certain components of the voting system; correct?

22 **A.** Correct.

23 **Q.** Was your visit to polling places on June 9 the first time
24 you had seen the Dominion system in use?

25 **A.** No. I have seen that multiple times in use in other

1 states.

2 **Q.** Was June 9th the first time you observed the voting
3 process in Georgia?

4 **A.** With this system, correct. I used to live in Georgia.

5 **Q.** I'm sorry. I'll let you finish.

6 **A.** No. I used to live in Georgia.

7 **Q.** Very well.

8 You would agree with me that physical security measures
9 can be used to mitigate cyber vulnerabilities; right?

10 **A.** Cyber defense requires physical because especially when a
11 general purpose consumer grade equipment are used that is a
12 fundamental requirement to achieve cybersecurity. It is not
13 mitigation. It is a fundamental requirement.

14 **Q.** And so when you testified in your declaration that not
15 having a password on the Poll Pad is an unacceptable practice,
16 you are basing that statement not based on Georgia's physical
17 security rules from the State Election Board? You are basing
18 that on your cybersecurity experience; correct?

19 **A.** That is correct. If you look in the Federal Information
20 Processing Standards, which are for everything -- which are
21 used in the private industry context, you see that passwords
22 are fundamental requirement.

23 **Q.** And in your declarations, you obviously identify a lot of
24 issues. But you would agree that they require more
25 investigation to determine what is actually going on; is that

1 fair to say?

2 **A.** Yes. Since the declarations I submitted, more information
3 has become available. So a lot of things which I have state to
4 be appearing, that is because of the amount of information I
5 had been able to obtain at that point in time. And later I
6 have learned more and got more evidence.

7 So that is why the -- certainly the level is limited
8 because I'm a very cautious man who wants to be certain that
9 what I have said is accurate.

10 **Q.** Very well.

11 One of the issues you identify in your declarations is
12 scanners taking differing amounts of time to accept or reject
13 the ballot.

14 Do you recall that testimony?

15 **A.** Yes, I do.

16 **Q.** And in reaching your conclusions or opining about that,
17 were you aware that there were five different ballot styles of
18 varying length in use in the June 9th primary in Georgia?

19 **A.** Yes, I was aware. And I was trying to observe to see if
20 the ballot style is giving a different time because you can
21 recognize the different ballots very easily from a distance.

22 **Q.** And you would agree with me though that different length
23 ballots could be a reason for a variation in a scanner's
24 processing time; correct?

25 **A.** When the ballot's QR code -- the amount of votes in that

1 shouldn't change the QR code interpretation time. So I cannot
2 conclusively say that it wouldn't. But it would defy the logic
3 of using QR codes.

4 **Q.** And, Mr. Hursti, did you examine any documents produced by
5 the State defendants in this case?

6 **A.** Only the documents which are not confidential or in any
7 way restricted.

8 **Q.** And are you -- you in your declarations have called for
9 additional testing for scanner thresholds.

10 Do you recall that testimony?

11 **A.** Yes, I recall. My statement here is that there are two
12 sets of parameters for scanner. The one parameter, which is in
13 the election software, and the other one is directly for the
14 scanner itself and the scanner driver. Those both need to be
15 in parallel locked into place to have any kind of meaningful
16 remedy into the problems observed right now.

17 **Q.** And are you aware that the State defendants produced a
18 document or did you review a document outlining the testing
19 process conducted by the Secretary's Center for Election
20 Services in studying ambiguously marked ballot samples?

21 **A.** I'm not certain I know which document you are referring
22 to.

23 **Q.** I'm going to share my screen here. I'm trying to make
24 this zoom in a little bit for you. It is kind of an executive
25 summary.

1 And down here at the bottom, you can see that it is
2 numbered State Defendants 0023540.

3 Do you recall ever seeing a document that looked like
4 this?

5 **A.** No, I actually don't. I have seen so many documents. But
6 I don't recall this document.

7 **Q.** Okay.

8 THE COURT: What number is it? Has it been submitted
9 to the Court?

10 MR. TYSON: I can submit it, Your Honor. I don't
11 believe it has been. I'll send it right now.

12 Just to Ms. Cole?

13 THE COURT: That is fine.

14 Are you offering it as an exhibit?

15 MR. TYSON: I am, Your Honor.

16 THE COURT: All right. Why don't you formally do so.
17 Then it is not just to Ms. Cole, but then you will deal with it
18 after you deal with the submission properly later.

19 MR. TYSON: Very well. So, Your Honor, we'll mark
20 this as Defendants' Exhibit -- and I believe we are on
21 Number 3. If not, Mr. Miller can correct me on that.

22 THE COURT: Just be careful when you email Ms. Cole
23 that you don't do it on the public -- I saw for a moment your
24 email to her and it was going to --

25 MR. TYSON: Oh, very well. Yes, ma'am.

1 **Q. (BY MR. TYSON)** Mr. Hursti, just to clarify then, you have
2 not looked at this document or were aware that the State had
3 conducted any kind of study like this?

4 **A.** I have -- I have seen the Dominion marketing material
5 discussing about the same topic. This is -- it has the same
6 discussion topic. But it doesn't look like this. So I can't
7 recall ever seeing this particular document.

8 **Q.** Very well.

9 THE COURT: What is the date of the document? Who is
10 it from? What is it that they are seeking to admit?

11 MR. TYSON: Certainly.

12 THE COURT: I need to know what it is.

13 MR. TYSON: Certainly. And I wanted to mark it just
14 so we had it for the record.

15 This is a report prepared by Michael Barnes at Center
16 for Election Services in July. It is part of the preparation
17 for the -- impartial preparation for the State Election Board
18 rule that was adopted today that relates to scanner thresholds.

19 MR. McGUIRE: Your Honor, I would just object to the
20 extent that Mr. Tyson is representing this as a report that was
21 prepared. But it is clearly marked draft. So it is unclear if
22 this is a final version of anything.

23 So I would object on the basis that it doesn't appear
24 to be what it is being represented to be on the face.

25 THE COURT: All right. Well, why don't you take a

1 look at it. And I'm not going to admit it at this point. But
2 he can -- you can ask him -- I mean, I don't think it is fair
3 to examine something -- him examine something that was a draft
4 because it probably wasn't distributed before as a public
5 document.

6 Was it distributed as a public document?

7 MR. TYSON: I don't know, Your Honor. I believe we
8 were going to have Mr. Harvey talk about kind of the process of
9 the rule that involves this analysis. Obviously, again, kind
10 of being out of sequence, I know it is a little bit difficult.
11 I just wanted to confirm Mr. Hursti has not seen this document.

12 THE COURT: He is indicating he has seen some
13 materials. I don't know whether it is from Dominion. I don't
14 know whether this is a Dominion -- all Mr. Barnes or whether
15 Mr. Barnes absorbed some of the information that was provided
16 by Dominion or what.

17 But -- so I think that in terms of -- you ought to --
18 if you want to question about anything, at least give him an
19 opportunity to look at it and read it.

20 MR. TYSON: Yes, Your Honor.

21 THE COURT: I don't know that he would have seen a
22 draft.

23 When did you provide it to the plaintiffs?

24 MR. TYSON: This was part of the group of documents
25 provided with the expedited discovery, Your Honor, related to

1 the --

2 THE COURT: So sometime in the last ten days or so?

3 MR. TYSON: Yes, Your Honor, I believe so. The 31st
4 or somewhere around there.

5 THE COURT: Okay. Well, I think his affidavit is
6 around there. The one before then and maybe there was one
7 September 1st. So I don't know.

8 Go ahead.

9 MR. McGUIRE: Your Honor, I have no objection to him
10 examining Mr. Hursti about anything that is in the document as
11 long he is not examining him based on him having familiarity
12 with the actual document, which he hasn't seen and obviously on
13 Zoom can't see.

14 MR. TYSON: Your Honor, again, I wasn't intending to
15 go line-by-line in this document. My intent was just
16 Mr. Hursti called for more research.

17 Was he aware that there was at least some research
18 that had been performed? That is the limitation. That is as
19 far as I was going to go.

20 THE COURT: All right.

21 MR. TYSON: So if we could -- Mr. McGuire, if we
22 could have Plaintiffs' Exhibit 7 put back up on the screen.

23 MR. McGUIRE: Sure.

24 MR. TYSON: I'll ask Mr. Hursti a setup question
25 here.

1 **Q.** (BY MR. TYSON) Mr. Hursti, you testified towards the end
2 of your testimony that voters should be instructed to fill in
3 the oval on a paper ballot.

4 Do you recall that testimony?

5 **A.** Correct.

6 **Q.** And have you reviewed the instructions that are on the
7 absentee provisional emergency ballot -- paper ballots that --

8 **A.** I have.

9 **Q.** And so you are aware looking at Plaintiffs' Exhibit 7 on
10 Page 1 that those instructions tell voters to fill in the
11 bubble; correct?

12 **A.** Correct. And many of the voters haven't been following
13 that which means that the instructions have not been effective.

14 **Q.** And you also see there on Page 1 of Plaintiffs' Exhibit 7
15 that only blue or black pen or pencils are to be used? Do you
16 see that?

17 **A.** Correct. And in the testing, it was found that inks which
18 are visible to human eye blue if they contact red pigment which
19 human eye cannot see the scanner is not very effective to
20 detect those markings. So the blue markings themselves are not
21 effective with the scanner.

22 **Q.** Very well.

23 Are you aware that the SEB -- the State Election Board
24 adopted rules relating to scanner thresholds at their meeting
25 today?

1 **A.** I was listening over one state of board elections thing.
2 I was on the audio only. I didn't see any documents. I heard
3 the conversation then and the ruling. But I did not know it
4 became effective today.

5 **Q.** And if we could go to the second page of Plaintiffs'
6 Exhibit 7.

7 Mr. Hursti, you earlier testified that the AuditMark would
8 contain ambiguous vote information and that it was marked
9 information.

10 Do you recall that?

11 **A.** Yes.

12 **Q.** Are you -- are you certain of that, or is it possible that
13 the ambiguous voter information is located somewhere other than
14 the AuditMark on the Dominion system?

15 **A.** So the ambiguous mark reading comes to the screen of the
16 voting machine. And with the logic unclear to me, sometimes it
17 overrides, sometimes not. I haven't been able to witness
18 enough other people doing -- operating the machine to
19 understand what the logic is.

20 **Q.** So you are not certain that the AuditMark would contain
21 ambiguous marked information? You are just assuming that?

22 **A.** I have seen an AuditMark -- AuditMark logs which have
23 entries indicating there has been ambiguous marks. Those have
24 been provided by the counties which are providing information.

25 So I am not -- I have not witnessed a number, under which

1 conditions the AuditMark is having that information log, but it
2 can be logged.

3 MR. TYSON: And we can stop the screen share now.
4 Thank you, Mr. McGuire.

5 MR. McGUIRE: Thank you.

6 **Q. (BY MR. TYSON)** Mr. Hursti, you would agree with me that
7 hand-marked paper ballots also have vulnerabilities to
8 manipulation by bad actors; correct?

9 COURT REPORTER: Manipulation by what?

10 MR. TYSON: I'm sorry. I'll just ask it again.

11 **Q. (BY MR. TYSON)** You would agree with me that the
12 hand-marked paper ballots also have vulnerabilities to
13 manipulation by bad actors; correct?

14 **A.** There is no such thing as perfect system.

15 **Q.** So is that yes?

16 **A.** Yes. Everything can be -- everything can be -- with
17 enough resources and motivation can be turned. So hand-marked
18 paper ballots is the best we have. Nothing is ever
19 100 percent.

20 **Q.** And it is your testimony that Georgia should not use its
21 Dominion optical scanners in the November 2020 election without
22 adjusting or making changes to the software that is utilized;
23 is that correct?

24 **A.** Yes. As a stop-gap measurement and mitigation, the way it
25 is operating and the way the configuration is set up should be

1 examined and changed to ensure that every vote counts.

2 **Q.** And, Mr. Hursti, my last question: Is it your testimony
3 that Georgia voters can have no confidence in the voting system
4 that we use in our elections?

5 **A.** In the situation where logs cannot be produced, when basic
6 security principles cannot be verified, I think it is very
7 prudent to say you couldn't trust something you cannot verify.
8 Even Ronald Reagan mentioned that, trust but verify. There is
9 no way to verify right now.

10 MR. TYSON: Okay. Thank you, Mr. Hursti. I don't
11 have any further questions.

12 MR. MCGUIRE: Your Honor, I just have a couple of
13 clarifying things on redirect very short, if I may.

14 THE COURT: Yes.

15 REDIRECT EXAMINATION

16 BY MR. MCGUIRE:

17 **Q.** Mr. Hursti, Mr. Tyson asked you if the precinct scanner
18 that you looked at was the one used in Georgia, and you said it
19 was not the one used in Georgia.

20 Can you explain why that is -- what the difference is
21 between the precinct scanner you examined and the precinct
22 scanners that are used in Georgia?

23 **A.** I don't believe there is any difference. It is a
24 physically different device because the device I bought was
25 used in New York. I don't believe there is meaningful

1 difference.

2 **Q.** So as far as actually reviewing a scanner that is used --
3 that has been used in Georgia, have you had any opportunity to
4 do that?

5 **A.** I have not been able to do anything else and observe when
6 other people are using the scanner.

7 **Q.** Okay. Second, Mr. Tyson asked you about the State
8 Election Board's rules governing storage and access to a voting
9 system and if you were aware of those rules.

10 Let's assume that those rules exist, and let's assume that
11 what you have observed is consistent with those rules.

12 Are the rules adequate to protect Georgia's elections?

13 **A.** I would say that if those are the rules then the rules are
14 not adequate and looking to other states, which kind of rules
15 they have enacted, and maybe get some best practices from other
16 states.

17 **Q.** Finally, you talked about the certification laboratories
18 that test voting systems for EAC certification. My
19 understanding is you don't believe those are independent
20 because they are paid by the vendor; correct?

21 **A.** In every industry, it is the same. Independent means that
22 you are independent from the vendor you are inspecting. And
23 receiving payments itself is a threat to that independence.

24 **Q.** And so do those labs test for -- is there distinctions
25 between testing for security and testing for functionality?

1 **A.** There is a humongous distinction between that. Security
2 is very much inconvenience in a lot of things because people
3 want to do things the easy way. Functionality is something
4 else again. So there is a humongous difference between testing
5 usability, testing physical shocking and writing, functionality
6 and security. They are all distinguishable different
7 disciplines.

8 **Q.** Based on what you know of how the certification labs test
9 voting systems for certification by the EAC, do they test both
10 functionality and security to the appropriate standard?

11 **A.** We have been conducting -- I have personally been involved
12 in EVEREST study. All those systems have passed the EAC
13 certification testing. And yet we found and reported 380 pages
14 of vulnerabilities even in the redacted version.

15 MR. MCGUIRE: Thank you. I have no further --

16 THE COURT: Redacted version? Is that what you said?
17 Even in the redacted version?

18 THE WITNESS: Yes. Redacted version was 380, top of
19 my head, plus or minus one page, if my memory is incorrect.

20 THE COURT: And this -- your report was independently
21 published, or was it submitted to EAC or some other entity?

22 THE WITNESS: So that study was commissioned by
23 Secretary of State Ohio. The study was conducted by Penn State
24 University -- team under Penn State University. So it was
25 independent. There was a university in between. And there was

1 the Secretary of State office in between. There was no direct
2 connection of money or otherwise with the vendor.

3 And this is really how independent studies should be
4 conducted. The team was conducting the study are not bound and
5 cannot be in any shape or form influenced by the people they
6 are examining and the system they are examining.

7 MR. TYSON: Just one brief follow-up question.

8 RECROSS-EXAMINATION

9 BY MR. TYSON:

10 **Q.** Mr. Hursti referenced a report from the Secretary of State
11 of Ohio. It is your testimony that all of the machines that
12 were examined in that report were EAC certified?

13 **A.** I believe that the system -- because they were in use.
14 Top of my head -- the report speaks for itself. Everything
15 what is there is listed.

16 But since Ohio requires certification, I believe they
17 were. But don't get -- look at the report. If there is
18 something, the report is correct and I'm wrong.

19 **Q.** And, Mr. Hursti, on that point, was any Dominion system
20 used -- the Dominion system used in Georgia part of that study
21 in Ohio?

22 **A.** Dominion has later acquired system different vendor. So
23 they were -- they are systems which are now under Dominion.
24 But none of the systems which is currently used here, the
25 precinct scanner, was not part of that study.

1 MR. TYSON: Thank you. I don't have any further
2 questions.

3 THE COURT: So let me ask this question, Mr. Hursti.

4 EXAMINATION

5 BY THE COURT:

6 Q. You recommended that the -- that the -- the scanners be
7 adjusted, they be higher basically -- higher digital quality --

8 A. Correct.

9 Q. -- or resolution. Can you articulate why anyone -- why
10 the State wouldn't do this? I'm trying to understand that as
11 well as what your response would be.

12 A. So I can only speculate why a choice has been made in
13 Dominion to artificially create images, which haven't been
14 accepted even for tax purposes for decades. Maybe it is to
15 have the same quality of images coming from the precinct
16 scanner or high speed scanner.

17 But I don't see any reason why -- why would you -- why
18 wouldn't you use the equipment you already have in hand the
19 best possible way as long as it doesn't lower any performance,
20 et cetera and since 300 DPI, which is obviously a little higher
21 than 200 DPI, and a higher information density is the office
22 standard -- office industry standard. I don't understand why
23 wouldn't you use what is standard for any general purpose
24 office.

25 Q. And is it your testimony that using the 300 DPI would

1 capture some of these marks that are now not evident?

2 **A.** The 300 DPI accompanied with changing it from solely black
3 or white to be either gray scale or color is critical to
4 capture that additional information. Because right now the
5 settings of the scanners are reducing the amount of
6 information. They are removing marks which the scanner saw,
7 and the marks are never translated to the files which are going
8 to the election system based on threshold values which happen
9 before the election software even sees that image.

10 So it is not only the resolution. It is the amount of
11 information which at the minimum have to be gray scale,
12 preferably color. That captures then what is the true look of
13 the ballot, how the voter saw it and marked.

14 **Q.** So just taking that last step there, you were saying it is
15 not just simply that it removes it but it basically -- when it
16 feeds it into the vote, it is not being counted, I assume, is
17 what you are saying?

18 **A.** So if, for example, the voter is using a pen, which is not
19 completely black, the scanner can remove that mark from the
20 image if it doesn't meet the scanner's internal threshold in
21 the translation of the sensor to the black and white. And that
22 is why it is paramount importance to capture more information
23 to the image itself so that the voting software has more to
24 analyze and can be more accurate.

25 THE COURT: Are there any questions in light of mine?

1 MR. MCGUIRE: Just to clarify -- yes, Your Honor, if
2 I may.

3 REDIRECT EXAMINATION (Further)

4 BY MR. MCGUIRE:

5 **Q.** Mr. Hursti, how difficult is that step of reconfiguring
6 the scanner to read that additional information, whether it is
7 the precinct scanner or the central count scanner?

8 **A.** The precinct scanner might be impossible because of the
9 hardware limitation of that. In the high speed scanner,
10 because that is a standard commercial off-the-shelf Canon
11 scanner, it is natively lots better images. That shouldn't be
12 troublesome at all.

13 **Q.** So that is a setting that is accessible to whoever has
14 access to the scanner?

15 **A.** Correct.

16 MR. TYSON: Your Honor --

17 THE COURT: Are either or all -- I just want to make
18 sure that -- I'm sorry.

19 These then would be the absentee ballots that are
20 coming into the central office essentially that are being -- if
21 they were not able to scan provisional ballots or they would
22 send -- the precincts would send them as well as far as you
23 know?

24 THE WITNESS: Yeah. And the real problem is the
25 people who are voting at home, they use whatever pen they have

1 and might be rushed to go to school or whatever. It is very
2 hard to enforce them to use proper pen. In-person voting even
3 when the scanner -- the precinct scanner is inferior, it is
4 easier to enforce good behavior from the voter than in-home
5 voting where people are going to do whatever they do anyway.

6 THE COURT: It sounds like a discussion about
7 instruction.

8 MR. McGUIRE: And I think the answer to your
9 question, Your Honor, was that the central scanner does scan
10 the mail ballots, the absentee ballots.

11 THE COURT: All right.

12 MR. TYSON: Your Honor, I just had one additional
13 question.

14 RE-CROSS-EXAMINATION (Further)

15 BY MR. TYSON:

16 **Q.** Mr. Hursti, is it your testimony that a change in the
17 scanner threshold settings does not require new EAC
18 certification of software, or do you know?

19 **A.** I don't know.

20 MR. TYSON: Thank you.

21 THE COURT: All right. Thank you very much. I
22 appreciate it.

23 THE WITNESS: Thank you, Your Honor.

24 THE COURT: How long is Ms. Dufort's testimony?

25 MR. BROWN: Your Honor, her testimony will be around

1 ten minutes.

2 THE COURT: All right. Well, it seems like a good
3 thing to do right now.

4 MR. BROWN: Plaintiffs would call Jeanne Dufort.

5 COURTROOM DEPUTY CLERK: Ms. Dufort, if you would
6 please raise your right hand.

7 **(Witness sworn)**

8 COURTROOM DEPUTY CLERK: Thank you, ma'am. If you
9 would, please state your name and spell your last name for the
10 record.

11 THE WITNESS: My name is Jeanne Dufort, D-U-F-O-R-T.

12 Whereupon,

13 JEANNE DUFORT,

14 after having been first duly sworn, testified as follows:

15 DIRECT EXAMINATION

16 BY MR. BROWN:

17 **Q.** Ms. Dufort, by whom are you currently employed?

18 **A.** I am self-employed. I'm a realtor.

19 **Q.** And briefly what is your background?

20 **A.** I have a business background in international sourcing and
21 manufacturing and resell. Wholesale supply chain.

22 **Q.** And where are you from?

23 **A.** I live in Madison, Georgia.

24 **Q.** Are you a member of the Coalition for Good Governance?

25 **A.** I am.

1 Q. Now, you're in Morgan County; is that right?

2 A. That is right. It is a beautiful place.

3 Q. And are you involved in any way in elections in Morgan
4 County?

5 A. I am. I am very interested in election integrity. So I
6 regularly attend the board of elections meetings. I have
7 routinely been a poll watcher. For this past June election, I
8 was both a poll watcher, I was a vote review panelist for the
9 democratic party. And I got drafted on election night for
10 three or four hours to open up mail ballots because we had 3000
11 of them, and it took some time.

12 Q. What does the vote review panel do?

13 A. So the vote review panel makes up for the limits of
14 technology. We take ballots that can't be scanned or ballots
15 that have marks that the scanner can't interpret, and we put
16 human eyes on them.

17 So I like to think of us as backstop to make sure that
18 every vote that can where voter intent is clear gets counted.

19 Q. And then how physically or mechanically does the vote
20 review panel make its decisions on votes?

21 A. Under the new system, for this election, we used the
22 adjudication software. So that meant we were reviewing
23 software on a -- we were reviewing ballots on a screen cued up
24 by the software.

25 Q. And in your -- that is what you did for the -- what is

1 it? -- the June election; is that right?

2 **A.** That is right.

3 **Q.** And in your review of the ballots in the adjudication of
4 those ballots, did you notice any anomalies in the way the
5 adjudication software was recording or indicating the results
6 of particular votes?

7 **A.** We did. Of course, it was our first time using the system
8 for all of us. So the whole thing was new. But the system was
9 that a ballot would be cued up that needed review. And if a
10 ballot was considered valid by the system, it was marked
11 highlighted with an overmark of green. If it was considered
12 ambiguous, it was highlighted with an overmark of yellow. And
13 anything that needed our attention, whether it was an overvote
14 or ambiguous, was boxed in with red. And so we were to spend
15 our attention on those. And that is what we were doing.

16 **Q.** In the process of reviewing what had been highlighted by
17 the system in those various colors, did you notice any
18 anomalies?

19 **A.** We did. We came across a ballot that had some green
20 marks, had some yellow marks, and a red box. But it also had
21 some clear voter marks that were not flagged in any way by the
22 software.

23 So I asked the Dominion tech, who was with us -- the vote
24 review panel is bipartisan. It is a democrat, a republican,
25 and somebody from the election board. So the three of us were

1 there with a Dominion rep.

2 And I asked him what about that vote, you know, did it
3 count. And he said, well, of course, it counted. And the rest
4 of us looked at it and said, well, good, because it should
5 count, it is a vote. And we went on, kept going.

6 The second time we found the same situation of a clear
7 vote with no adjudication marks on it at all. No green, no
8 yellow. I asked the tech, can you show me what the system
9 thought about that vote? He said, sure. There is AuditMark.
10 I can show you the AuditMark. That is the record of what is
11 counted for this ballot. And that is where it got interesting.

12 **Q.** What did you do next?

13 **A.** We looked at -- the tech brought up the AuditMark for that
14 particular race. And to all of our surprise, it told us that
15 there wasn't a vote there.

16 **Q.** And did you notice this anomaly on other votes that were
17 within the voter review panel there in Morgan County?

18 **A.** Yeah. As we went through our batch -- I think we had to
19 review about 150 ballots out of the 3000 roughly mail
20 ballots -- we found probably as many as ten different ballots
21 that had -- no, a little more than -- that had votes that
22 hadn't been counted. We said close to 20. We weren't keeping
23 a log. At the time, it was so fresh and so new and, frankly,
24 so shocking that we were just trying to make sure we focused on
25 making sure every vote counted.

1 Q. And did you take any -- did you take photographs of what
2 you were seeing?

3 A. No. That is not allowed.

4 Q. Okay. And have you seen any illustrations that would be
5 helpful for you in describing what you saw?

6 A. Yeah. The New York Times did an article shortly after
7 this came out, and they included an image that they represented
8 as coming from a county, and it looked an awfully lot like what
9 I saw while I was doing that work.

10 Q. Excuse me. Could I have Number 13 up on the screen,
11 please.

12 Is Plaintiffs' Exhibit 13 an illustration that you saw in
13 the New York Times that resembles what you saw?

14 A. It is.

15 Q. Describe for the Court what this shows.

16 A. So the Justice of Supreme Court with Beth Beskin and
17 Charlie Bethel has a red box around it and a yellow highlight
18 over that vote. That is telling us, vote review panel, do your
19 thing, decide if this is a vote.

20 But the race below it was with Hal Moroz and Sarah Warren.
21 It doesn't really have an outline. You have to look carefully
22 to be sure of that, but look to the right. The red box doesn't
23 continue down.

24 So that is an example of a ballot that would have -- or
25 vote that is just not being counted. It is being seen by the

1 system. But the system is saying this is not a vote.

2 **Q.** Now, was this the first that you had heard of this -- when
3 you were doing your vote review panel the first that you had
4 heard of this problem?

5 **A.** Absolutely.

6 **Q.** And then did you subsequent to that hear that from other
7 jurisdictions?

8 **A.** Yes. And I reached out to some of my friends who were on
9 vote review panels for other counties and asked if they had
10 come across this. And, in fact, other counties had also seen
11 it.

12 **Q.** And in skipping ahead --

13 THE COURT: Could you -- so you are saying that this
14 vote for Sarah Warren -- Justin Warren would be recorded as a
15 blank?

16 THE WITNESS: That's right.

17 MR. BROWN: If you could take that exhibit down now
18 off screen share.

19 THE COURT: Are you tendering this?

20 MR. BROWN: Yes, we are tendering that as Exhibit --
21 the premarked number is 13.

22 THE COURT: All right. Just stay with that for now.

23 **Q. (BY MR. BROWN)** Then, Ms. Dufort, have you recently had
24 the opportunity to test precinct scanners supplied by Fulton
25 County?

1 **A.** Yes.

2 MR. BROWN: And, Your Honor, this is -- this is the
3 equipment that was supplied by Fulton County pursuant to your
4 order. I have distributed to the defendants what I'm going to
5 have her identify, which are some photographs of the testing
6 that she conducted.

7 And I am just alerting everybody to this in light of
8 the previous discussion about Dr. Halderman's testimony. Our
9 position is there is nothing even close to confidential or
10 sensitive. But I'm just alerting the parties to that.

11 **Q.** (BY MR. BROWN) Ms. Dufort, let me put up on the screen
12 Exhibit 17 if we could.

13 Just while that is happening, let me set this up. You
14 were reviewing -- you had access to a scanner that had been
15 supplied by Fulton County; correct?

16 **A.** Yes.

17 **Q.** What is Exhibit 17?

18 **A.** Exhibit 17 is a hand-marked ballot. We can see three
19 races on the front side, and there were two races on the
20 backside of this ballot.

21 **Q.** Okay. And what does this particular exhibit show?

22 **A.** It shows votes -- five votes for all five races. This
23 particular voter used an X to mark their ballot.

24 **Q.** And is this a test ballot that you used?

25 **A.** It is.

1 Q. I notice it says Anywhere County; right?

2 A. Right.

3 Q. What was -- I don't want to say what was the result that
4 the scanner told you. But what was the scanner's reaction, I
5 guess? What did you see from the scanner when this was used?

6 A. When the scanner saw these marks, it decided that they
7 were not votes and it reported it as a blank ballot.

8 Q. And so -- and this was -- this was a ballot that you fed
9 into the --

10 A. I personally fed it through multiple times because it
11 seemed so surprising.

12 Q. And did you have the opportunity to feed in other ballots
13 to test the effectiveness of the system?

14 A. I did.

15 Q. And I know you have a video of this. But I'm going to
16 show -- did you take a video of that?

17 A. Yes.

18 Q. And did you take that video and then make some still
19 photographs out of that?

20 A. I was the one feeding into the scanner, so I didn't
21 personally shoot the video. But yes.

22 Q. Okay. Let's look at Exhibit 12 --

23 MR. BROWN: We would like to introduce 17 into the
24 record, Your Honor -- Plaintiffs' Exhibit 17.

25 THE COURT: Any objection? Are there any objections?

1 MR. RUSSO: No, Your Honor.

2 THE COURT: And were there any objections to 13?

3 MR. RUSSO: No, Your Honor.

4 THE COURT: Okay. They are both admitted.

5 MR. BROWN: We would like to pull up on the screen
6 Number 12.

7 **Q. (BY MR. BROWN)** And while that is coming up, Ms. Dufort,
8 can you tell the Court what your methodology was in feeding the
9 same ballot in over and over again and why you did it that way?

10 **A.** Sure. The purpose of this was to try as best we could
11 replicate how human beings do things. And that is to say never
12 the same way twice.

13 So we took many of these sample ballots and put them
14 through the scanner in each of the possible ways the voter
15 might see this through, top side up, top first and then bottom
16 first, and bottom side up, top first, and then bottom first to
17 see if it made any difference in how the scanner saw the vote.

18 **Q.** I believe I may have the wrong exhibit number. Can you
19 pull up please the -- the exhibit with the number of different
20 ballots in it? I thought it was 13, 17, or 12. But I must
21 have the wrong number.

22 MR. BROWN: Excuse me, Your Honor, while we do that.

23 **(There was a brief pause in the proceedings.)**

24 **Q. (BY MR. BROWN)** While we're looking for the exhibit that
25 has the number of photographs that you took from the video,

1 could you simply describe narratively for us what you did and
2 what results you received from the scanner.

3 **A.** Sure. So the ballot had five contests on it. Three were
4 races, and two were questions. When I put it through, the
5 first thing I did was put it through each of the four possible
6 ways to feed it. And each time, I got a different message from
7 the scanner. It would return it with an error saying there
8 were ambiguous marks, but it never pointed out the same
9 ambiguous marks.

10 I'm going to look at my notes here in absence of the
11 image. So the first time when we put it in face up like you
12 see first, it told us that one SPLOST race, one of the contests
13 on the backside, was ambiguous.

14 The second time when I put it in bottom first, it told me
15 that the liquor sale vote was what was ambiguous and it didn't
16 tell me anything about the SPLOST.

17 The third time when I turned it over and put it backside
18 facing up top end, it told me the SPLOST and one of the judge
19 races was ambiguous.

20 Then the fourth time when I put it backside bottom in, it
21 told me the SPLOST and the liquor sales was in there. So four
22 different times feeding and four different error messages.

23 The important thing to understand about how this was
24 working -- the precinct scanner is designed to help a voter
25 catch their own mistakes or at least the things that the

1 scanner doesn't understand about their vote. It doesn't tell
2 you affirmatively what it is accepting for a vote. So you will
3 not hear if it is deciding it is a no vote. You will only hear
4 if it thinks it is ambiguous.

5 And it might tell you if the vote cast, but it won't tell
6 you if it counted all five. So I would call that a bit lacking
7 in terms of voter prompts because I may be told I have one race
8 that is ambiguous and I fix that. As a voter, I am going to
9 assume that all of the others were good. But that may not be
10 true, and you are not told by the scanner.

11 **Q.** Ms. Dufort, we now have the exhibit on the screen.

12 **MR. BROWN:** And for the record, this is an exhibit
13 number that I will be told momentarily and put in the record.

14 **Q. (BY MR. BROWN)** But for now, does this show the stills of
15 the video that you took of what you were doing?

16 **A.** It does. And this is the ballot I was describing.

17 **Q.** Okay. And so what you did is you just fed it different
18 ways repeatedly, and you got different results from the scanner
19 almost every time; is that right?

20 **A.** Yes. And there is more.

21 **Q.** Please tell us.

22 **A.** After getting four different results feeding it four
23 different directions, I decided to see if I set it the same
24 direction five straight times would I get the same answer five
25 straight times.

1 **Q.** What happened?

2 **A.** I never got the same answer five straight times, no matter
3 which direction I fed it in.

4 **Q.** Would you expect a computer that is just a computer to
5 give you different results based upon the exact same input five
6 different times?

7 **A.** I would not. All my life training says reports out of
8 computers are consistent. It is people who aren't. But this
9 is the opposite.

10 MR. BROWN: I do not have any further questions at
11 this time. And we would introduce this exhibit into evidence.

12 MR. RUSSO: I'm sorry. Is it -- Bruce, I'm sorry.
13 Is it just this one page? I think you had originally sent us a
14 compilation of photos.

15 MR. BROWN: It is the compilation I sent you that we
16 would like introduced, and I will perfect the record later.

17 MR. RUSSO: To the extent that they have not been
18 authenticated, because I think they are photos that Ms. Dufort
19 took, we would say that they are not admissible yet. But
20 Mr. Brown can lay that foundation if he needs to.

21 THE COURT: Well, go ahead and do the foundation. I
22 mean, she took -- she has been talking about this very
23 document.

24 MR. RUSSO: And this first page is fine. I think it
25 is a document that has -- it is Page 1 of 27 at the bottom.

1 That is all. I have no objection to this first document.

2 THE COURT: Are you trying to introduce 26 other
3 pages?

4 MR. BROWN: I am, Your Honor.

5 THE COURT: All right. Well, then have her identify
6 what the rest of it is then.

7 MR. BROWN: If we could -- if we could scroll through
8 a couple of seconds at a time each of those pages.

9 THE COURT: Watch out. Somebody is typing while you
10 are speaking.

11 **Q. (BY MR. BROWN)** Ms. Dufort, would you describe what we are
12 doing just generally?

13 **A.** Sure. These first few are just giving you better images
14 of how the voter -- how the vote was marked.

15 **Q.** And this is taken of the test ballots that you ran on the
16 Fulton County machine last week?

17 **A.** That is right. This is one ballot we're looking at. All
18 27 photos are of this ballot and what happened as we put it
19 through the scanner.

20 So this is going through the scanner for the first time,
21 and this is the first result -- the error message that we got,
22 ambiguous for one vote.

23 **Q.** And I believe you testified that error message is supposed
24 to prompt the voter who is feeding the ballot into the scanner
25 to correct something; correct?

1 **A.** That is right. So as a voter, I would look at this and I
2 would probably strengthen my markings around the SPLOST
3 education vote and put it back through.

4 **Q.** If you could keep scrolling will be fine. Thank you.

5 **A.** And that is showing what that mark was. You can see what
6 the voter mark was. Now I am feeding it through bottom -- face
7 up but bottom side. Same ballot.

8 **Q.** And the scanner is supposed to take it any of those four
9 ways; correct?

10 **A.** That is right. All the training in the poll worker
11 training says they can feed it any way. This time, we have a
12 note of an ambiguous mark, but it is the Sunday liquor sales.
13 It is a different contest. And there is that voter mark.

14 Now we flipped it over, and we're feeding the top side of
15 the back in first. I am. This time it sees two ambiguous
16 marks, that SPLOST and now we have added the judge of the
17 probate court.

18 Now I am feeding it backside bottom, SPLOST for education
19 and Sunday liquor sales. Again -- so this is -- you have now
20 gone through four possible ways to feed it, and you have gotten
21 four different ambiguous messages.

22 **Q.** And do the rest of the photos similarly detect different
23 combinations?

24 **A.** That is right. And so we have, you know, 20 different
25 times I put that one ballot through, five times each for each

1 of the possible ways to feed it. And I could never get the
2 same answer between the different ways to feed it, and I could
3 never get five same answers for any one direction.

4 **Q.** And did you sort of deliberately use a checkmark on those?
5 They are checked? You didn't fill in the ovals; is that right?

6 **A.** They are. We tested other types. Voters -- my
7 understanding -- I'm not a lawyer. But my understanding as a
8 vote review person for many years is if voter intent can be
9 discerned you count the vote.

10 **Q.** And that is what you do? Both parties and the third party
11 would count a vote when it is clear what the voter intended?

12 **A.** Yeah. I can't imagine anyone sitting on a vote review
13 panel that would challenge any of these votes except the one on
14 the left of the first page.

15 You don't have it in front of me right now on that side.
16 But that one is marked kind of funny. Right? Right over
17 there, bottom left. That is a funny write-in. So probably my
18 vote review panel would actually have not even known what that
19 vote was for, and we would not have counted that vote. But we
20 would have counted all the others because they were clear.

21 **MR. BROWN:** Thank you very much, Ms. Dufort. I have
22 no further questions. But I would like to go ahead and admit
23 Plaintiffs' Exhibit Number 12.

24 **MR. RUSSO:** No objection.

25 **THE COURT:** It is admitted.

1 MR. RUSSO: Yes, ma'am. No objection.

2 Your Honor, could I proceed?

3 THE COURT: Yes.

4 CROSS-EXAMINATION

5 BY MR. RUSSO:

6 **Q.** Ms. Dufort, my name is Vincent Russo, and I represent the
7 State defendants in this case. It is a pleasure to meet you
8 over Zoom.

9 **A.** Thank you.

10 **Q.** I have a few questions for you quickly. Now, when did you
11 conduct your review of these -- these ballots in Fulton County
12 that you just discussed?

13 **A.** Tuesday of this week.

14 **Q.** And where did you conduct that review?

15 **A.** Downtown Atlanta in a law office.

16 **Q.** Now, the ballot photos identify a county that is called
17 Anywhere County. How did you obtain those ballots?

18 **A.** I don't know. I wasn't part of the process of getting the
19 equipment there or getting the ballots. It was done by
20 direction of the Court, and it was outside my purview.

21 **Q.** Okay. I wasn't sure if this was -- I must have misheard
22 you earlier. I didn't realize this was the Court-ordered
23 inspection. I thought this might be a different one.

24 Now, prior to conducting the test, did you conduct any
25 testing on the scanner?

1 **A.** No.

2 **Q.** And did you check any of the scanner settings?

3 **A.** No.

4 **Q.** Do you know what the scanner settings were at at the time
5 of the test?

6 **A.** No idea.

7 **Q.** Do you have any -- any special education in election
8 systems?

9 **A.** No. I'm a citizen volunteer.

10 **Q.** And you are not being offered as an expert in this -- in
11 this case; right?

12 **A.** I am being offered because I served on a vote review panel
13 and had an experience that was useful.

14 **Q.** And you would agree with me that voters are instructed to
15 fill in the ovals next to the candidate that they are
16 selecting; right?

17 **A.** Yes.

18 **Q.** You have -- at least you state so much in your
19 declaration; correct?

20 **A.** Yes.

21 **Q.** And you would agree with me also that marks that do not
22 register on the scanner is because the ovals that were supposed
23 to be filled in were instead marked with checks in this case?

24 **A.** You are going further than something I can agree with.

25 THE COURT: Mr. Russo, I don't think this is useful.

1 MR. RUSSO: I'll move on, Your Honor.

2 **Q.** (BY MR. RUSSO) The scanners -- now, you are aware of the
3 State Election Board rule that was passed today setting the
4 scanner threshold at 10 percent and a 20 percent threshold?

5 **A.** I was watching this hearing at the time that vote was
6 taken, but I was at that meeting earlier this morning and made
7 remarks to that State Election Board telling them that in my
8 opinion that ten percent threshold will result in votes not
9 being cast. And I believe the report that was proffered for
10 Harri that was marked draft confirms that.

11 **Q.** I'm sorry?

12 **A.** The report that was proffered for Harri to look at, the
13 one that was marked draft that CES did, confirms that seven
14 votes will not be cast as the result of the setting of 10 to
15 20 percent. It is in the report.

16 **Q.** And you believe that the controlled scanner setting should
17 be lower than ten percent?

18 **A.** I believe that a computer should never be allowed to
19 discard a vote without human review. We have a vote review
20 panel process. It works.

21 I think the setting -- whatever setting is necessary to
22 kick these things out to let humans look at them is what works
23 for voters.

24 **Q.** So you would -- you do think it should be a lower
25 threshold than ten percent?

1 **A.** I do.

2 **Q.** And according to your declaration, you state that in the
3 June primary there was about five percent of the ballots that
4 had to be reviewed by the vote review panel?

5 **A.** In my county, yes.

6 **Q.** In your county. And would you agree that a lower scanner
7 threshold setting would require more time and ballots to be
8 reviewed?

9 **A.** Well, there is good news. That same rule that they
10 apparently passed today, according to you, dropped the upper
11 threshold from 35 to 20. And that will result in close to a
12 40 percent reduction, according to that same CES report.

13 So we're going to free up some time on the top end that
14 was wasted and spend some very valuable time making sure every
15 vote gets counted as cast.

16 **Q.** And do you have any idea if the move to an all hand-marked
17 paper ballot system what five percent of the total vote being
18 reviewed would look like?

19 **A.** I haven't done the math. I could do it.

20 MR. RUSSO: Okay. Thanks.

21 No more questions, Your Honor.

22 THE COURT: Let me just ask -- did you have some
23 follow-up, Mr. Brown? I'm sorry. You have the --

24 MR. BROWN: I'm sorry, Your Honor. I don't have any
25 more questions.

EXAMINATION

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BY THE COURT:

Q. All right. I just wanted to get some clarity since you had spent a lot of time at the polls at this juncture, more than I have.

When you say when the voter puts the -- this is like for a provisional ballot that would be doing this -- right? -- because --

A. If you were in a precinct, you would not be putting it through the scanner for provisional. If you were in a precinct, you would be putting it through if you were voting under the emergency ballot rule.

Q. Okay. If you were putting it in -- all right.

And when you were adjudicating ballots for Morgan County, were you looking at both? The central office and the precinct level?

A. We do -- the vote review panel winds up looking at all accepted provisional ballots. So some did come in from the precinct level. But we were primarily looking at the mail-in absentee ballots.

THE COURT: And we were talking about the ten percent. I'm going to assume, Mr. Russo, you are not saying that is the same as what Mr. Hursti is saying? I mean, that's a different number. Are we having -- I just want to make sure that we are having clear communication.

1 MR. RUSSO: The ten percent is the threshold under
2 the SEB Rule, Your Honor.

3 THE COURT: Right. But that is different than doing
4 what Mr. Hursti was recommending, which is adjusting the
5 measure -- the DPI level on the scanner -- right? -- unless you
6 are saying something different?

7 MR. TYSON: Your Honor --

8 MR. RUSSO: Yeah. Go ahead, Bryan.

9 MR. TYSON: I think I can clarify this, Your Honor.
10 Bryan Tyson. Mr. Hursti was talking about the dots per inch.
11 This is the percentage of the oval that is filled.

12 THE COURT: Right. So there are two different ways
13 of getting at this issue.

14 **Q. (BY THE COURT)** But with the ten percent, your concern,
15 Ms. Dufort, is that you still will have ballots you don't get
16 to look at?

17 **A.** So here -- you need to think about what are the things
18 that go into that judgment of ten percent -- okay? -- when the
19 scanner is reporting. You have the scanned image. That is
20 what Harri was talking about, the DPI, high quality image.
21 Then you have the software looking and interpreting that image.
22 Okay?

23 But what goes into what the scanner sees depends on a lot
24 of things, including, you know, humidity, including how much
25 of -- how dark the oval mark is. You saw some very light oval

1 marks and some darker oval marks. It matters what color ink
2 you have used.

3 So there are a number of different things that go into
4 that judgment. So I am just here to say very simply I have
5 seen enough votes go uncounted to be very uncomfortable with
6 the very idea. And I have seen a report from the State that
7 affirms that at ten percent votes will not be counted. They
8 will be definitively discounted and not even shown to vote
9 review panel people. And I think that is crazy.

10 THE COURT: All right.

11 MR. BROWN: Your Honor, I have a follow-up questions
12 about emergency ballots and provisional ballots, if I might.

13 THE COURT: Okay.

14 REDIRECT EXAMINATION

15 BY MR. BROWN:

16 **Q.** Ms. Dufort, are you familiar with all of the precinct
17 scanner -- what you were looking at were not black ovals that
18 would have been put in by -- with a black ballot pen --
19 correct? -- the ones that you were testing?

20 **A.** That is right.

21 **Q.** And so the test that you were doing was designed to
22 determine how generally one of these scanners might read
23 mail-in ballots; correct?

24 **A.** That is right.

25 **Q.** And might it be different for -- like, say, the switch was

1 made to hand-marked paper ballots, for example. What would
2 based upon your observations you expect the scanner to behave
3 or not behave with respect to those kinds of ballots?

4 **A.** Well, Harri, who spoke earlier, is the most knowledgeable
5 person I personally know about scanners. But I have also
6 reviewed some of the Dominion manuals that we have acquired
7 through Open Records.

8 And it appears to be true that there is a best practices
9 in the world of what pen you should use to mark ballots. You
10 can't control that with ballots marked from home. But you
11 certainly can control it in a precinct.

12 MR. BROWN: Thank you very much.

13 THE COURT: Thank you. Are there any -- did we take
14 care of all the exhibits, Mr. Brown?

15 MR. BROWN: Yes. We would make sure. It is 12, 13,
16 17. I think they are all admitted.

17 THE COURT: All right. Very good.

18 All right. Well, my suggestion at this point is that
19 counsel look at those -- be given an opportunity to look at the
20 movie that we -- the five-minute movie and we adjourn the
21 public proceeding and that we at least discuss the movie and
22 how we are proceeding for tomorrow. All right?

23 And we're going to adjourn the public portion of
24 this, and I think we'll just -- we'll take care of that
25 business and how we're going to handle tomorrow so that we are

1 proceeding tomorrow.

2 MR. RUSSO: Your Honor, could we take a quick
3 five-minute restroom break?

4 THE COURT: Absolutely. It is 6:08. We're going to
5 call it 6:10.

6 Shall we resume at 6:25? Will that --

7 MR. RUSSO: That is plenty of time for me.

8 THE COURT: Right. Holly, you have the movie?

9 LAW CLERK COLE: I do. And I have forwarded it to
10 you as well.

11 THE COURT: Okay. All right.

12 MR. CROSS: Your Honor, just to clarify, we're going
13 to come back in here? We're not going on a phone call?

14 THE COURT: Well, we can -- you know, we can go
15 back -- let's go back on a phone call. We can always go back
16 on this, and you can look at something together.

17 I don't really want to be on a space that I can't
18 assure right now the privacy of.

19 MR. CROSS: All right. Very good.

20 THE COURT: So we'll go back on the telephone at
21 6:25. Thank you, everybody.

22 **(A brief break was taken at 6:09 P.M., and the**
23 **parties resumed with a telephone conference, as**
24 **follows:)**

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THE COURT:

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MR. CROSS:

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THE COURT:

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MR. CROSS:

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THE COURT:

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MR. TYSON:

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THE COURT:

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MR. CROSS: [REDACTED]

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THE COURT: [REDACTED]

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MR. CROSS: [REDACTED]

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MR. CROSS: [REDACTED]

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THE COURT: [REDACTED]

MR. MILLER: [REDACTED]

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THE COURT: [REDACTED]

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MR. CROSS: [REDACTED]

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MR. MILLER:

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THE COURT:

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MR. BROWN:

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MR. MILLER:

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MR. CROSS:

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MR. CROSS:

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THE COURT:

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THE COURT:

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MR. CROSS:

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MR. CROSS: [REDACTED]

DR. HALDERMAN: [REDACTED]

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MR. CROSS: [REDACTED]

LAW CLERK COLE: [REDACTED]

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MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

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MR. CROSS: [REDACTED]

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LAW CLERK COLE: [REDACTED]

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MR. BROWN: [REDACTED]

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MR. CROSS: [REDACTED]

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MR. McGUIRE: [REDACTED]
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MR. McGUIRE: [REDACTED]
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MR. McGUIRE: [REDACTED]
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MR. TYSON: [REDACTED]

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MR. TYSON:

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MR. McGUIRE:

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MR. TYSON:

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MR. CROSS:

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MR. BROWN:

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MR. BROWN:

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MR. MILLER:

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**(The proceedings were thereby adjourned at 6:54
P.M.)**

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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 208 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 12th day of September, 2020.

Shannon R. Welch

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

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

4 DONNA CURLING, ET AL., :
5 :
6 PLAINTIFFS, :
7 vs. : DOCKET NUMBER
8 : 1:17-CV-2989-AT
9 BRAD RAFFENSPERGER, ET AL., :
10 :
11 DEFENDANTS. :

12 **TRANSCRIPT OF HEARING ON PRELIMINARY INJUNCTION VIA ZOOM**
13 **PROCEEDINGS**

14 **BEFORE THE HONORABLE AMY TOTENBERG**

15 **UNITED STATES DISTRICT JUDGE**

16 **SEPTEMBER 11, 2020**

17 **8:16 A.M.**

18 **VOLUME 2**

19 **REDACTED**

20 **MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED**

21 **TRANSCRIPT PRODUCED BY:**

22 **OFFICIAL COURT REPORTER:** **SHANNON R. WELCH, RMR, CRR**
23 **2394 UNITED STATES COURTHOUSE**
24 **75 TED TURNER DRIVE, SOUTHWEST**
25 **ATLANTA, GEORGIA 30303**
(404) 215-1383

A P P E A R A N C E S O F C O U N S E L

**FOR THE PLAINTIFFS DONNA CURLING, DONNA PRICE, JEFFREY
SCHOENBERG:**

DAVID D. CROSS
VERONICA ASCARRUNZ
EILEEN BROGAN
MORRISON & FOERSTER, LLP

HALSEY G. KNAPP, JR.
ADAM M. SPARKS
KREVOLIN & HORST, LLC

**FOR THE PLAINTIFFS COALITION FOR GOOD GOVERNANCE, LAURA DIGGES,
WILLIAM DIGGES, III, AND RICARDO DAVIS:**

BRUCE BROWN
BRUCE P. BROWN LAW

ROBERT ALEXANDER MCGUIRE, III (VIA VIDEO CONFERENCE)
ROBERT MCGUIRE LAW FIRM

FOR THE STATE OF GEORGIA DEFENDANTS:

VINCENT ROBERT RUSSO, JR.
CAREY A. MILLER
ROBBINS ROSS ALLOY BELINFANTE LITTLEFIELD, LLC

BRYAN P. TYSON
BRYAN JACATOUT
DIANE LAROSS
LOREE ANNE PARADISE
TAYLOR ENGLISH DUMA

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FOR THE FULTON COUNTY DEFENDANTS:

CHERYL RINGER
KAYE BURWELL
OFFICE OF THE FULTON COUNTY ATTORNEY

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WITNESS

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Direct Examination
By Mr. McGuire

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* * *

CERTIFICATE

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P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; September 11, 2020.)

(Witness sworn)

THE COURT: All right. State your name for the record.

THE WITNESS: My name is Juan Gilbert.

THE COURT: Very good. Go ahead, Mr. Miller.

MR. MILLER: Thank you, Your Honor.

Whereupon,

JUAN GILBERT, PH.D.,

after having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MILLER:

Q. Dr. Gilbert, what is your current employment?

A. I am at the University of Florida where I am the current department chair of the computer and information science and engineering department. And in that position, I am also a full professor, endowed professor with tenure.

Q. Thank you. And can you walk us through your professional background and research in election systems and security?

A. Yes. In 2003, my lab built an open source voting system called Prime III. That is Prime Roman Numeral III. And that system was designed to have a universal implementation so that everyone independent of their ability or disability could use the same technology.

1 And we designed it to be useable, secure, and accessible
2 all at the same time. And that system since 2003 has been
3 through several pilots and elections as far as organizational
4 elections. And I have had the opportunity to serve on -- serve
5 as an expert for the United States Election Assistance
6 Commission.

7 I served on a national academy committee on the future of
8 voting. And we have done additional work in elections dealing
9 with lines. That was more recent. We have done some work on
10 voter ID, which isn't relevant here. But those are some
11 highlights.

12 THE COURT: Dr. Gilbert, I think that there is some
13 degree of feedback on your line. Is there any echo, or is
14 that -- I can hear my own voice now.

15 THE WITNESS: I think that is someone else other than
16 me.

17 THE COURT: We all are having an echo.

18 MR. MILLER: I was hearing that as well. It seems to
19 have stopped.

20 THE COURT: All right. That is better.

21 All right. Go ahead.

22 **Q. (BY MR. MILLER)** Thank you, Dr. Gilbert. And as far as
23 your education, what degrees do you hold?

24 **A.** I have a bachelor of science degree in systems analysis
25 from Miami University in Ohio. I have a master of science in

1 computer science from the University of Cincinnati, and I have
2 a Ph.D. in computer science from the University of Cincinnati.

3 **Q.** Thank you. And, Dr. Gilbert, prior to your position now
4 at the University of Florida, have you held other positions at
5 other universities?

6 **A.** Yes, I have. I started my career at Auburn University --

7 MR. CROSS: Your Honor?

8 THE COURT: I'm sorry.

9 MR. CROSS: I'm sorry, Your Honor. This is David
10 Cross. Just for efficiency, Your Honor has his CV. If they
11 want to propose a scope of expertise, we may be able to just
12 cut to the chase.

13 THE COURT: Why don't we go ahead and do that.

14 MR. MILLER: That is certainly fine by me. We would
15 admit Dr. Gilbert as an expert in election systems and
16 security.

17 MR. CROSS: Election systems is fine. We object to
18 security. But for the sake of the hearing, Your Honor, we can
19 move on.

20 THE COURT: All right. Well, why don't we say
21 election systems. And if you want to examine him further as to
22 the defense with your experts during the course of your
23 examination, you can address the issue of security.

24 MR. MILLER: Your Honor, I would request at that
25 juncture to be able to redirect on that topic to the extent

1 that we're going to have a challenge on a scope or
2 qualification issue after I complete.

3 And, of course, in the interest of efficiency, we can
4 move beyond the background.

5 THE COURT: All right. Please do.

6 MR. MILLER: And I would just briefly like to mention
7 to the Court one additional background point.

8 **Q. (BY MR. MILLER)** Dr. Gilbert, you were admitted as an
9 expert in the case *National Federation of the Blind vs. Lamone*;
10 correct.

11 **A.** Yes.

12 **Q.** Okay. And in that case, in fact, you were admitted and
13 the Court discussed your qualifications in election systems and
14 security. Do you recall that?

15 **A.** Yes.

16 MR. MILLER: And just for counsel and Your Honor, the
17 Westlaw cite to that order is 2014 WL 4388342.

18 **Q. (BY MR. MILLER)** And so, Dr. Gilbert, you mentioned that
19 you had served on a committee with the National Academies of
20 Science, Engineering, and Mathematics; correct?

21 **A.** Correct.

22 **Q.** And was that -- that was the Committee on Future Voting;
23 right?

24 **A.** Yes.

25 **Q.** I'm trying to recall your testimony accurately.

1 And did that committee produce a report?

2 **A.** Yes, we did.

3 **Q.** And what is that report titled?

4 **A.** I think Securing the Vote: American Democracy or
5 something like that. I don't know it off the top. But I know
6 Securing the Vote is how it begins.

7 **Q.** Sure. Okay.

8 THE COURT: What year was the report?

9 THE WITNESS: 2018, if I'm not mistaken.

10 THE COURT: And was -- was Dr. DeMillo on that
11 committee with you? There were several people?

12 THE WITNESS: No.

13 THE COURT: There were several people in this case
14 who had been on one of these or another of NSA, of the National
15 Science Academy. I was trying to determine.

16 So you were on the committee, or was there a larger
17 group that did -- was responsible for issuance of the other
18 report?

19 THE WITNESS: It is just a committee that was
20 responsible, and I was a committee member.

21 THE COURT: All right. Fine. Go ahead.

22 MR. MILLER: Your Honor, of course, the National
23 Academy's report, Securing the Vote, we have discussed a number
24 of times in this case. I know Your Honor recognizes it.

25 THE COURT: All right.

1 **Q.** (BY MR. MILLER) Dr. Gilbert, I'm going to just ask you a
2 few questions without trying to comprehensively go back over
3 your declarations in this case.

4 But for starters, you do recall submitting declarations in
5 this case; right?

6 **A.** Yes.

7 **Q.** Okay. And those were two declarations; correct? One last
8 year in the fall of 2019 and then this year?

9 **A.** Correct.

10 **Q.** Of anything in your -- contained in those declarations,
11 has your opinion changed?

12 **A.** I don't think so, no.

13 **Q.** Without asking you whether you would prefer to put a comma
14 somewhere else, but the thrust of it, that opinion has not
15 changed?

16 **A.** Correct.

17 **Q.** Dr. Gilbert, can you talk to us a little bit about the
18 similarities of BMD and hand-marked paper ballot voting
19 systems?

20 **A.** The similarities are both yield a paper ballot that can be
21 voter verified and from implementation both tend to be scanned
22 by a separate machine. And then they have the ability to be
23 audited by a third party. And those are the major
24 similarities.

25 **Q.** And what about any differences between the two?

1 **A.** There are differences. Hand-marked paper ballots are
2 obviously marked by an individual by hand. Whereas, the BMDs
3 are marked by the device.

4 Wow, there are a lot of differences. So some of the
5 differences -- I think in my declaration I talk about
6 undervotes and overvotes. Undervotes and overvotes are
7 represented differently. On a hand-marked paper ballot, an
8 undervote is a blank. And on a BMD, it says no selection or it
9 can say there is nothing there. It can comment. And then
10 overvotes are -- can be prohibited in a BMD, but you can't
11 prohibit them in hand-marked paper ballots.

12 Those are some of the differences. But there are others.

13 **Q.** And without, again, trying to go back over the entirety of
14 your declarations, I know your research has a lot of focus on
15 accessibility; is that correct?

16 **A.** Yes.

17 **Q.** And with respect to accessibility, do you have an opinion
18 about the voting systems between hand-marked paper ballots and
19 BMDs?

20 **A.** Yes. Hand-marked paper ballots are not accessible. For
21 people with disabilities, in particular those who are blind or
22 visually impaired, they can't use those without assistance.
23 Whereas, a BMD they can do so without assistance. That is a
24 major difference.

25 I will also say a difference is hand-marked paper ballots

1 allow for ambiguous input, meaning the voter could write stray
2 marks and do things that are ambiguous that require
3 interpretation of an auditor or a third party. Where to my
4 knowledge, that has never, ever happened with a ballot-marking
5 device.

6 **Q.** I want to talk about a couple of things in your most
7 recent declaration. You talked about a few studies regarding
8 voter verifications of ballots.

9 Can you tell the Court about those?

10 **A.** Yes. There are some studies out there. One was done -- I
11 refer to it as the University of Michigan study. And then
12 there is the Rice study. So the Michigan study is
13 Dr. Halderman and his colleagues. And then the Rice study, Dr.
14 Byrne.

15 And in the Michigan study -- well, essentially what they
16 were saying in summary is that voters do not in sufficient
17 numbers verify their ballots. And they made that determination
18 is my interpretation of their paper.

19 However, the Rice study came back and said that voters can
20 actually identify their errors in their ballot and verify them
21 if they actually take the time to do it.

22 So there is a distinction in the Rice study showing that
23 if people don't look at their ballots obviously they can't
24 verify it. But when they do look at it, they can verify at a
25 high rate.

1 So the distinction was that the Rice study actually
2 segregated that decision. Whereas, the Michigan study did not.

3 **Q.** I see. So the difference between whether voters attempted
4 to verify and whether voters can verify? Is that about
5 accurate?

6 **A.** Yes. There is a major difference.

7 **Q.** And how about voter review and verification of hand-marked
8 paper ballots? Are you aware of any research regarding that
9 topic?

10 **A.** I am not aware of any research. If it wasn't for this
11 virus, the pandemic, we were planning to do a study on that
12 very topic. However, there aren't any studies. But there have
13 been elections that have pointed to weaknesses in voter
14 verification of hand-marked paper ballots.

15 **Q.** And what are some of those examples off the top of your
16 head?

17 **A.** The presidential election in 2000 here in Florida. We had
18 paper ballots, and people left not knowing whether they had
19 marked their ballots correctly. That is the first case.

20 There was a case in 2008 in Michigan, the Al Franken, Norm
21 Coleman senate race. There were stray marks on the ballot.
22 People didn't know if their vote would count.

23 2010, Alaska, Lisa Murkowski was written in. And people
24 didn't know if their write-ins would count.

25 More recently, I think 2018 here in Florida, another case

1 where people completely missed a contest, and so they didn't
2 even know.

3 So there are other examples of where hand-marked paper
4 ballots have not been, I guess, verified accurately by the
5 voters.

6 **Q.** Thank you, Dr. Gilbert. And in terms of that study you
7 were referring to regarding the verification of hand-marked
8 paper ballots -- right? -- when you say we, is that you at the
9 University of Florida and your colleagues, colleagues from
10 other institutions, or your lab there?

11 **A.** My lab. We were going to do a study on hand-marked paper
12 ballots.

13 **Q.** And am I correct in that that is -- is that the Human
14 Center Computer Lab?

15 **A.** Human Experience Research Lab. That is what we call it.
16 HXR Lab.

17 **Q.** Dr. Gilbert, do you generally have an opinion about
18 whether the use of BMD-based paper voting systems are
19 sufficiently secure?

20 **A.** I would consider them sufficiently secure. There is risk
21 associated with that. The key is minimizing those risks. So I
22 would say the implementation can be sufficiently secure.

23 **Q.** And in terms of minimizing those risks and securing voting
24 systems, are those topics you covered in the protecting the
25 vote -- securing -- or excuse me -- Securing The Vote:

1 Protecting American Democracy report?

2 **A.** Yes.

3 **Q.** Is the Georgia BMD system implementation consistent with
4 the recommendations of that report?

5 MR. CROSS: Objection, Your Honor.

6 **A.** In my opinion, yes.

7 MR. MILLER: I'm sorry. Is there an objection?

8 MR. CROSS: Yes.

9 Sorry, Your Honor. Could you hear me? I objected.

10 THE COURT: What is the basis of the objection?

11 MR. CROSS: He has never seen the Georgia system. He
12 has no basis to answer the question he was just asked.

13 THE COURT: All right.

14 MR. MILLER: Your Honor, Dr. Gilbert is aware of the
15 system setup and procedures and frankly --

16 THE COURT: I think you have to lay a foundation.

17 MR. MILLER: Well, frankly, the Securing the Vote
18 report doesn't get into detailed system specifications. And so
19 I'm asking about the consistency of the principles of the two
20 systems.

21 MR. CROSS: He has never seen the Georgia system.

22 THE COURT: The objection is sustained. Just go
23 ahead and ask the question rather than answering it yourself.
24 All right?

25 **Q.** **(BY MR. MILLER)** Dr. Gilbert, considering the principles

1 contained in the Securing the Vote: Protecting American
2 Democracy report and your understanding of the setup and
3 implementation of Georgia's voting system, do you believe those
4 two items are consistent?

5 **A.** Yes.

6 MR. CROSS: Objection, Your Honor.

7 THE COURT: Could you identify your objection
8 specifically.

9 MR. CROSS: Sorry. It is the same objection. He
10 asked the same question. He didn't lay a foundation. He has
11 never seen the Georgia system. He can't speak to what the
12 setup is or if it is secure or how it compares to some other
13 system.

14 MR. MILLER: Your Honor, I'm trying to follow the
15 Court's direction to not --

16 THE COURT: I know you are. I know you are. But I
17 think you have to basically explain the basis of your --
18 Dr. Gilbert, you reflect the basis of your conclusion, yes, and
19 then identify what you know specifically personally about the
20 Georgia system that makes it congruent with the principles that
21 you think are summarized in the Protect the Vote report.

22 THE WITNESS: Sure. From what I understand, the
23 implementation in Georgia -- the proposed implementation is air
24 gapped. It produces a paper ballot. Those were the two
25 fundamental principles that we wanted in a ballot-marking

1 device to give us extra security.

2 THE COURT: Air gapped and what was the second?

3 THE WITNESS: It prints a ballot that has human
4 readable text on it.

5 THE COURT: So you are -- the air gapped is Number 1,
6 that you wanted to be sure that it was air gapped meaning that
7 there were no potential other inputs into it that would corrupt
8 or --

9 THE WITNESS: Correct.

10 THE COURT: Okay. And I thought there was an
11 auditing principle as well?

12 THE WITNESS: Yes. But that is independent of the
13 BMD.

14 THE COURT: All right. Fine.

15 **Q. (BY MR. MILLER)** And, Dr. Gilbert, I believe you
16 summarized some of these principles and properties in your
17 declaration; correct?

18 **A.** Yes.

19 THE COURT: And your understanding is that it is air
20 gapped, but you haven't personally observed or inspected any of
21 the systems; is that correct?

22 THE WITNESS: Yes, Your Honor. That's correct.

23 THE COURT: Okay.

24 **Q. (BY MR. MILLER)** Dr. Gilbert, you mentioned audits there
25 briefly. And a recommendation for risk-limiting audits, was

1 that included in the Securing the Vote report?

2 **A.** Yes.

3 **Q.** And in terms of your testimony in your declarations, when
4 you discuss audits, on what basis are you offering those
5 opinions? So in other words, are you offering an opinion as to
6 detailed specifications or as to general principles of
7 risk-limiting audits?

8 **A.** I'm offering that based on our report. The consensus
9 committee was that we should have an audit, a risk-limiting
10 audit. And I am not an expert in audits. I am following the
11 principles of our consensus committee that did consist of
12 individuals who have expertise in auditing.

13 **Q.** Dr. Gilbert, can I revert briefly to one thing you
14 mentioned earlier regarding accessibility?

15 Do you have an opinion on a system which offers generally
16 hand-marked paper ballots and separately BMDs for
17 accessibility?

18 **A.** Yes. You have a scenario, which is the motivation for me
19 even getting into this area of elections, where you create an
20 environment where some people are voting on hand-marked paper
21 ballots and some are voting with BMDs. You create a separate
22 but equal connotation, and that simply doesn't work.

23 In practice, we have seen where people with disabilities
24 show up to vote and the accessible machine is in the corner and
25 the poll workers say, well, we don't know how to set it up.

1 And then there is the other scenario from a security
2 perspective, which is if -- with the proliferation of
3 ballot-marking devices, it has encouraged people with
4 disabilities to vote. And that is a positive thing in my
5 opinion.

6 With that said, you have increased the number of people
7 with disabilities who actually participate in the elections
8 now. With tight elections, it is very likely that or possible
9 that you could have the number of people with disabilities
10 voting to exceed the margin of victory.

11 In that particular scenario, if a ballot-marking device is
12 used and if you claim that ballot-marking devices are
13 compromised or vulnerable, that is an easier target. Meaning,
14 if I only have to worry about people with disabilities using
15 it, that empowers me to do more mischief in the machine because
16 it is less likely to be detected. Whereas, if more people are
17 using it, you increase the chance of it being detected.

18 So those are my opinions on segregating the electorate by
19 people with disabilities and those who do not have them.

20 **Q.** And if I recall your prior testimony, that was part of the
21 impetus of your creation of the Prime III voting system; right?

22 **A.** Yes. Because in 2002, the United States Congress created
23 the Help America Vote Act and required at least one accessible
24 voting machine in every voting place.

25 And in doing so, I realized what would happen. And in

1 bringing this to the attention of the EAC who was created
2 shortly thereafter and others, they said it is impossible. You
3 can't create one technology there one could use. So we did it.

4 **Q.** And that Prime III voting system, has that been used in
5 actual elections?

6 **A.** Yes. To my knowledge, Prime III is the only open source
7 voting technology to be used in state, federal, and local
8 elections. The State of New Hampshire used it statewide as
9 their accessible voting equipment, and then Butler County,
10 Ohio, uses it as their absentee system. And to my knowledge,
11 my lab is the only academic lab to produce a voting system that
12 has actually been used.

13 MR. MILLER: Thank you, Dr. Gilbert. No further
14 questions, Your Honor, with the -- I think I will probably need
15 redirect.

16 THE COURT: All right. Thank you.

17 MR. CROSS: May I proceed, Your Honor?

18 THE COURT: Yes.

19 CROSS-EXAMINATION

20 BY MR. CROSS:

21 **Q.** Good morning, Dr. Gilbert.

22 **A.** Good morning.

23 **Q.** Dr. Gilbert, when were you retained by the State as a
24 consultant for this case?

25 **A.** I don't recall. I would have to go look in my email or

1 records to get the exact date.

2 **Q.** Your first declaration was in November of last year. Do
3 you remember if it was six months before that or a year before
4 that?

5 **A.** Honestly I don't remember. Unfortunately I can't -- I
6 don't remember.

7 **Q.** But we know you have been a consultant for the State in
8 this case at least since November of last year; right?

9 **A.** If that is when my statement was at least, that would be
10 correct.

11 **Q.** And in none of the declarations you have submitted in this
12 case have you indicated that you've conducted any examination
13 of Georgia's Dominion BMD setup; right?

14 **A.** That's correct.

15 **Q.** And, in fact, in none of your declarations you indicate
16 you have conducted any cybersecurity assessment of Georgia's
17 Dominion BMD system; right?

18 **A.** I have not had access to Georgia's BMD system. So I
19 couldn't do any assessments.

20 **Q.** Did you ask for access?

21 **A.** No, I did not.

22 **Q.** You didn't think that was important for the opinions you
23 are offering in the case; is that right?

24 **A.** No.

25 **Q.** No, that is right? I'm sorry. It gets confusing.

1 **A.** No. I disagree with you. So I -- from my experience, I
2 didn't ask because in prior litigation in the United States
3 we -- many experts have never been given access to the
4 equipment. So it never crossed my mind to ask simply because I
5 know that has not been a precedent that I have seen.

6 **Q.** So you thought it was important, but you did not ask for
7 it? Is that what you are saying?

8 MR. MILLER: Your Honor, asked and answered.

9 **A.** It never crossed my mind because in prior -- from my
10 experience, no one has gotten access to these machines. So it
11 never crossed my mind. I never thought of it.

12 **Q.** **(BY MR. CROSS)** In your November 2019 declaration, you
13 wrote that the Georgia BMD system -- this is Paragraph 43 if
14 you want to reference -- the Georgia BMD system includes a new
15 EMS, which replaces the old EMS in its entirety, and there is
16 simply no software continuity between the two systems to
17 transmit viruses or malware.

18 Do you recall that?

19 **A.** I don't recall it. But it is in my statement.

20 **Q.** And you testified today that your understanding is the
21 system is air gapped; correct?

22 **A.** Correct.

23 **Q.** And you don't know that because you have never seen it;
24 right, sir?

25 **A.** All I can do is go on the documents that are provided to

1 me. I have not -- again, I have not had access to the actual
2 machine.

3 **Q.** So the answer to my question is yes, you don't know that
4 it is air gapped and there is no continuity because you have
5 never looked at the system; right?

6 **MR. MILLER:** Objection, Your Honor. Compounded
7 question.

8 **THE COURT:** Just simplify the question.

9 **Q. (BY MR. CROSS)** You don't know that the system is air
10 gapped because you have never looked at it? Yes or no, sir?

11 **A.** I have never looked at it. The documents told me it was
12 air gapped.

13 **Q.** What documents?

14 **A.** There is a specification, I believe I have, about it. So
15 that is my understanding.

16 **Q.** So you are assuming it is set up to some specification
17 that you read; right?

18 **A.** Yes.

19 **Q.** Did you read the declaration that Dr. Halderman submitted
20 on September 1st after your most recent declaration?

21 **A.** Yes.

22 **Q.** But you didn't respond -- you have not responded to that
23 in anything you have submitted to the Court; correct?

24 **A.** I don't believe so, no.

25 **Q.** In the November 2019 declaration you put in, that

1 obviously does not address the use of the Georgia election
2 system in 2020? We can agree on that; right?

3 **A.** I'm not understanding your question.

4 **Q.** You submitted a declaration in November of last year.
5 Okay?

6 **A.** Okay.

7 **Q.** That predates the use of this system this year; right?

8 **A.** I submitted a declaration in November. My comments in
9 that declaration may or may not apply to the 2020 election. I
10 would have to know exactly what pieces of it are you claiming
11 or would be claiming that are irrelevant or relevant.

12 **Q.** Let me try it this way: In none of your declarations do
13 you discuss the application -- the actual use of the Georgia
14 Dominion system in any 2020 election; correct?

15 **A.** In my declaration, I do not believe I discussed the 2020
16 election.

17 **Q.** You talked about the Prime III voting system that you
18 offer. That uses QR codes; right?

19 **A.** That is an option. It is not required. It has another
20 technique called informed OCR, which stands for informed
21 optical character recognition, which you do not have to have a
22 QR code to use.

23 It would print the text and then use a technique through
24 OCR -- this technique called informed OCR. So that is an
25 option that election officials can turn on and use it or not.

1 Q. So there are BMD systems available today that do not use
2 QR codes; right?

3 A. I don't know for certain.

4 Q. Didn't you just tell us yours does that?

5 A. Yes.

6 Q. Now, you talk about your -- you described the Prime III
7 system as software independent; right?

8 A. Yes.

9 Q. And that is a recognized standard in the computer science
10 field; right?

11 A. I wouldn't say computer science. I would say in the
12 election community, yes.

13 Q. And software independent means that the election results
14 do not depend on the correct operation of the software for the
15 equipment that is used in the election; right?

16 A. No, that is not correct. Software independence says that
17 a change -- an intentional or unintentional change in the
18 software could not create an undetected outcome in the
19 election.

20 Q. And nowhere in your declarations do you offer an opinion
21 that the Georgia Dominion BMD system is software independent;
22 right?

23 A. I don't recall if I discussed it or not. But based on my
24 knowledge of the Georgia system, it is software independent.

25 Q. And that is knowledge where you are assuming it is set up

1 according to some specification in some document you read
2 because you --

3 **A.** That's correct.

4 **Q.** Parallel testing cannot provide software independence for
5 a voting system; right?

6 **A.** Parallel testing is -- not to sound jokingly, but
7 seriously, parallel testing is independent of software
8 independence.

9 **Q.** Right. It is a separate step from determining whether a
10 system is software independent?

11 **A.** No. They are not related at all.

12 **Q.** Okay. And software verification, like logic and accuracy
13 testing, also is not used to determine software independence
14 for a voting system; right?

15 **A.** Right. Those things are used to detect errors or things
16 like that. Software independence is not the same thing. It is
17 a different concept.

18 **Q.** You believe the gold standard for securing elections
19 should be the audit; right?

20 **A.** Correct.

21 **Q.** And you addressed audits at length in your November 2019
22 declaration, including RLAs; right?

23 **A.** I wouldn't say at length. Again, I'm not an audit expert.
24 So I didn't go into details of how an audit is executed or the
25 theory behind the audit.

1 Q. But in your most recent declaration, you indicated that
2 you are offering no opinions as to the specific procedure of
3 recounts and RLAs in Georgia? So you are not offering any
4 opinions on the audit procedures that are used in Georgia;
5 right?

6 A. Not on the -- I'm -- my opinion is that you have to have
7 an audit in guidance with our report from the National Academy.
8 And we preference a risk-limiting audit is what we have said.

9 Q. You are not offering any opinion to this Court that the
10 audit procedures that have been adopted in Georgia -- that
11 those are reliable? You are just not opining on them at all?

12 A. Exactly.

13 Q. Okay.

14 A. That's correct.

15 Q. Have you examined the new rule that the Georgia State
16 Elections Board adopted yesterday for RLAs in the State?

17 A. The new -- say that again. The new what?

18 Q. Are you aware that the Georgia State Elections Board, as I
19 understand it, approved a rule yesterday that requires a single
20 RLA for a single statewide race every other year and that race
21 is to be selected by the Secretary of State? Have you seen
22 that rule?

23 MR. MILLER: Objection, Your Honor. I think there
24 needs to be a foundation laid as to what the rule is. And if
25 Mr. Cross wants to give his opinion as to what the rule is,

1 then we can put him on the stand as an expert.

2 THE COURT: Well, that is a key provision of it. It
3 is not the only part of the rule. He can ask about has he seen
4 that.

5 **A.** No, I have not.

6 **Q.** (BY MR. CROSS) So you are not offering an opinion to the
7 Court that that provision meets best practices or reliability
8 standards for RLAs? That is not an opinion you are offering;
9 right?

10 **A.** Correct. I am not offering that opinion.

11 **Q.** One of the concerns that has been raised about the
12 Dominion BMD is that an attacker could infect the BMDs with a
13 malicious code that causes them to print barcodes that do not
14 match the printed text of the ballot; right?

15 **A.** Okay.

16 **Q.** You are aware that that is a concern; right?

17 **A.** I have heard that concern in this case and before this
18 case.

19 **Q.** And your response to that is that such an attack is
20 unlikely to go undetected in a jurisdiction conducting RLAs
21 because an audit which recognizes a single inconsistent
22 barcode/text combination would signal a significant problem?
23 Do you remember writing that?

24 **A.** Yes.

25 **Q.** That sort of attack easily could go undetected in a

1 jurisdiction such as Georgia where none of the elections are
2 subject to an RLA except possibly a single statewide election
3 every other year; right?

4 MR. MILLER: Objection, Your Honor. The same
5 objection as before.

6 THE COURT: If Georgia has such a system at this
7 point as described in the question, that only -- that there is
8 only one race where there will be a risk-limiting audit every
9 other year, would that impact your assessment of whether there
10 are adequate checks and balances for the issue of -- referenced
11 as the concern in the BMD system?

12 THE WITNESS: I'm happy to answer that question, Your
13 Honor. And I will begin by saying I would like to change the
14 question somewhat. The context of this question is
15 inappropriate and incorrect.

16 The context of the question is around the barcode
17 versus the human readable text in the context of a
18 risk-limiting audit. I would argue strongly that if we were
19 using hand-marked paper ballots and you use --

20 THE COURT: All right. I'm sorry. I am asking you a
21 question, and I'm really -- you are not free to move the
22 subject. I'm really trying to find out about the question I
23 posed.

24 It is not this versus something else at this
25 juncture, and I understand that that is something you may want

1 to discuss later. But I am asking really about trying to
2 follow up on counsel's question specifically.

3 THE WITNESS: Right. Specifically, if that scenario
4 was to happen where the barcode did not match the human
5 readable text and the audit did not occur on that contest, then
6 you would miss that -- that change in the election. It would
7 be missed.

8 THE COURT: Thank you.

9 **Q. (BY MR. CROSS)** Last topic, Dr. Gilbert. You understand
10 that a different type of attack scenario that has been
11 discussed concerning Georgia's BMDs is that both the barcode
12 and the printed text could be altered so that neither reflects
13 the selections of the voter? You understand that has been
14 raised; right?

15 **A.** Yes.

16 **Q.** And your response to that is that the only measure you
17 identified to detect that sort of hack is ensuring voters
18 review their ballots? That is what you identified in your
19 declaration; correct?

20 MR. MILLER: Objection, Your Honor. If Mr. Cross is
21 pointing to the only thing that does something, he is certainly
22 happy to read out or point him to a paragraph. At this point,
23 we're characterizing multiple levels of testimony.

24 MR. CROSS: It is Paragraph 13.

25 **Q. (BY MR. CROSS)** Do you recall testifying to that?

1 THE COURT: Paragraph 13 of his August 26 --

2 MR. CROSS: It is his original declaration.

3 THE COURT: Of his original affidavit. All right.

4 MR. CROSS: Dr. Gilbert, do you need your
5 declaration? Do you have it?

6 MR. MILLER: David, I think we're on the wrong --
7 Paragraph 13 of the original declaration is, I have provided
8 expert testimony.

9 MR. CROSS: I'm sorry. Yeah. I'm sorry. It is the
10 most recent. Thank you, Carey.

11 THE COURT: All right. So it is at Document 821-7.

12 MR. CROSS: Yes, Your Honor. My apologies.

13 **Q. (BY MR. CROSS)** Dr. Gilbert, do you need to look at this?

14 **A.** No.

15 **Q.** So do you recall testifying that in the attack scenario in
16 which both the barcode and the printed text are both altered --
17 and you referenced Dr. Halderman's discussion of that -- you
18 say the issue again is ensuring voters review their ballots.
19 And then you go on to talk about research indicating that the
20 type of interventions that you discuss improve voters' rates of
21 review.

22 Do you recall that testimony?

23 **A.** Yes.

24 **Q.** And you cite specific research in your declaration; right?

25 **A.** Yes.

1 Q. And the very research you cite indicates that most voters
2 don't review their ballots from BMDs when they submit them;
3 right?

4 MR. MILLER: Objection, Your Honor. We have
5 testimony as to research that can come from Dr. Gilbert and not
6 from counsel.

7 THE COURT: Overruled.

8 MR. CROSS: I don't understand that.

9 THE COURT: Overruled. Continue and ask the
10 question.

11 A. There is research that presents that an insufficient
12 number of voters review their ballots.

13 Q. (BY MR. CROSS) I mean, the title of the research that you
14 yourself cite -- literally the title is Voter Verification of
15 BMD Ballots is a Two-part Question: Can they? Mostly, they
16 can. Do they? Mostly, they don't. That is the title; right,
17 sir?

18 A. I don't recall the title of the paper. I would have to
19 look. Is that the Rice study?

20 THE COURT: He asked you a --

21 Q. (BY MR. CROSS) What are you asking me?

22 A. I cite two studies, which is the Michigan study and the
23 Rice study, which I referenced earlier today.

24 Q. This is the study in 43 of your supplemental declaration
25 by Kortum, Byrne, and Whitmore.

1 **A.** Yeah. That is the Rice study, yes.

2 **Q.** Well, let's talk about the specifics since you don't
3 remember the title.

4 You point out in your declaration that -- this is what you
5 write. Let me turn back. This is at Paragraph 9 of your most
6 recent declaration.

7 And you write, as the paper explains -- this is the Rice
8 study -- the ability of voters to actually detect manipulation
9 of their vote choices was quite good. Then you put in
10 parenthesis, of the 25 voters who actually examined the
11 printout, 19 of them detected at least one anomaly.

12 Do you see that? Do you remember that?

13 **A.** Yes.

14 **Q.** But what you don't tell the Court in your declaration is
15 that those 25 voters who examined their ballots -- that was 25
16 out of 108. So only 23 percent of the voters who were in that
17 study examined their ballots at all.

18 That doesn't appear in your declaration, does it, sir?

19 **A.** I don't recall mentioning that.

20 **Q.** You also point out, as we just read, that this study shows
21 that prompts to review the ballot increases the odds that
22 voters will do so.

23 Do you recall telling the Court that?

24 **A.** Yes.

25 **Q.** But you didn't -- you did not tell the Court that the

1 authors of that study themselves emphasized in the study --
2 they write, the results here are not conclusive because the
3 statistical power with only 25 voters is too limited. In other
4 words, so few voters looked at their ballots at all that the
5 author said you can't -- you can't reach any reliable
6 conclusive results here.

7 That is not mentioned in your declaration, is it, sir?

8 **A.** No, I didn't mention that in my declaration.

9 **Q.** You agree that voting machines that do not provide the
10 capacity for independent auditing, for example, machines that
11 do not produce a voter verifiable paper audit trail, should be
12 removed from service as soon as possible? You agree with that;
13 right?

14 **A.** Are you referring to DREs, the machines that would store
15 electronic ballots? Is that what you are referencing to?

16 **Q.** I am referring to something you wrote at -- if you turn to
17 your supplemental declaration, it is Page 136. It looks like
18 remarks that you delivered to the Chairperson Lofgren, Ranking
19 Member Davis, Members of the Committee.

20 Do you recall this? You attached it to your declaration.

21 **A.** Yes.

22 **Q.** Do you recall saying in that what I just read to you,
23 voter machines that do not provide the capacity for independent
24 auditing, for example, machines that do not produce a voter
25 verifiable paper audit trail, should be removed from service as

1 soon as possible? Do you recall saying that?

2 **A.** I recall this, yes.

3 **Q.** You also agree that each state should require a
4 comprehensive system of post-election audits of processes and
5 outcomes; correct, sir?

6 **A.** Yes.

7 MR. CROSS: I have no further questions, Your Honor.

8 MR. BROWN: Your Honor, I have a few questions on
9 cross. This is Bruce Brown.

10 THE COURT: All right.

11 CROSS-EXAMINATION

12 BY MR. BROWN:

13 **Q.** Dr. Gilbert, my name is Bruce Brown. I represent the
14 Coalition plaintiffs in this case.

15 If we could see Plaintiffs' Exhibit Number 1, please. If
16 you could screen share that, please, Clinton. This is a
17 different exhibit. But I will start with this just to move
18 quickly.

19 Dr. Gilbert, I have put on the screen what I will call
20 Gilbert Demonstrative Number 1. And let me walk you through
21 this for purposes of analysis.

22 Mr. Cross just went over with you the detection rate from
23 the Rice University study, which was 19 out of 108. Do you
24 follow me?

25 **A.** This is the recent study by Byrne and Kortum?

1 Q. That's correct.

2 A. I thought it was 25.

3 Q. I think if you look closely, 25 of the voters looked at
4 their ballot.

5 A. I see what you are saying. Okay. I'm with you now.
6 Okay.

7 Q. 19 detected some error in the ballot. Are you with me?

8 A. Okay. Go ahead.

9 Q. Let me quickly go through a hypothetical and see if you
10 agree with my analysis. Let's say you have 4 million voters.
11 Half -- that's the second row.

12 Do you follow me?

13 A. Yes.

14 Q. And then half of them are BMD voters. Okay. Half mail
15 voters. Are you with me?

16 A. Yes.

17 Q. Let's say five percent of the BMD ballots were hacked.
18 That would be 100,000; correct?

19 A. Okay.

20 Q. And the number of hacks using your numbers detected --

21 A. My numbers? I thought you said this is the Rice study;
22 correct?

23 Q. Yes. I'm using a hypothetical election. Okay? Yeah.
24 The Rice study.

25 A. You said -- you referred to it as my numbers. Have you

1 seen my numbers?

2 **Q.** That is correct. I'm using the Rice study numbers.

3 **A.** Okay. I thought you were using numbers from things we
4 have done. But that is -- that is the Rice numbers. I see.

5 **Q.** The Rice numbers, which are actually more generous to BMDs
6 than would be, for example, the Michigan study.

7 Do you follow me?

8 **A.** Okay.

9 **Q.** And let's say that -- let's say that five percent of the
10 ballots were hacked -- the BMD ballots were hacked. That would
11 be 100,000 ballots.

12 Are you with me?

13 **A.** Okay.

14 **Q.** And according to the Rice detection rates, that would be
15 about 17-, 18,000 that would be detected; correct?

16 **A.** So -- okay. I'm doing the math. Okay.

17 **Q.** And then --

18 **MR. MILLER:** Your Honor, I would like to just offer
19 an objection to whatever this demonstrative is here and
20 wherever it came from, other than out of counsel's head or at
21 least for some foundation to the witness as far as --

22 **MR. BROWN:** This is not an objection.

23 **THE COURT:** This is an objection as to -- is this
24 data from the Rice study, or are these numbers that you have
25 assembled not from the Rice study, Mr. Brown? I think that is

1 all I need to confirm.

2 MR. BROWN: The only number that is from the Rice
3 study is the top row. The other is a hypothetical use for
4 purposes of cross-examination.

5 THE COURT: All right. For ease, we're going to go
6 ahead. I may just in the end not consider this at all.

7 But go ahead.

8 **Q. (BY MR. BROWN)** And then, Mr. Gilbert, if 18 percent of
9 the mistakes are caught and detected, let's say those people
10 get their votes redone. Do you follow me? They go to the poll
11 worker and say change my vote; right? Are you with me?

12 **A.** Correct.

13 **Q.** That would still leave 82,000 undetected hacks. Do you
14 follow me? Because most of the people don't check. And those
15 that check, not all of them notice the mistake.

16 Are you with me?

17 **A.** No, I don't agree.

18 **Q.** Well, do you think there is data that more people would
19 check and catch that?

20 **A.** Absolutely. So we had an incident in, I think, a 2008
21 election in West Virginia. And there was an allegation of vote
22 flipping on a DRE. People were trying to vote for Barack Obama
23 and they said it flipped to John McCain.

24 And when that happened to one person, that spread like
25 wildfire. And the community of voters were more vigilant and

1 looked. And we discovered what really happened in that wasn't
2 that the software was hacked or anything. It was a human error
3 of where they were touching the screen.

4 So in this analogy that if an individual says this printed
5 my vote wrong, this is not how it worked, that somehow that
6 case would be isolated is -- I beg to differ that it would be
7 isolated.

8 So in an election, I would suspect the numbers of people
9 looking would increase as a result of the rumor that the
10 machines are misbehaving.

11 **Q.** Okay. Well, that is actually exactly my point of this.
12 But if -- if only 18 percent of the people caught the mistake,
13 there would still be 82 percent of the people who did not;
14 correct?

15 **A.** If 18 percent, just doing the math, and you subtract the
16 number, then you get that number as you have. If 50 percent
17 checked, then it would be cut in half. That is -- the math
18 says so.

19 **Q.** And given in this hypothetical though, with so few people
20 detecting it and a material but not gigantic hack, you have
21 less than one percent of the voters would be reporting changed
22 votes? Do you follow me? The last row.

23 **A.** I think that is correct mathematically.

24 **Q.** Okay. And this would affect 164,000 impact upon the
25 election. Do you follow me? Because you are switching 82,000

1 votes, which you would have to double if it is going from
2 candidate A to candidate B. Do you follow me?

3 **A.** I'm not following that exactly. But I see the math behind
4 it, as far as the percentage of being less than one percent. I
5 see that part.

6 **Q.** And so with --

7 **A.** The total impact, I'm not understanding that part.

8 **Q.** Okay. The 164,000-vote impact would be enough to change
9 the electoral results in 2018 in Georgia for the Governor's
10 election, the Lieutenant Governor's election, the Attorney
11 General's election, and the election for the Secretary of
12 State; right?

13 **A.** I don't know the margins of victory to any of those
14 contests.

15 **Q.** But that would be in the public record; right?

16 **A.** Yes. Those margins of victories.

17 **(Electronic interference)**

18 THE COURT: All right.

19 MR. BROWN: Okay. Let me move on. If I could have
20 PX 1 -- Plaintiffs' Exhibit 1 put on the screen. Thank you.

21 **Q. (BY MR. BROWN)** Dr. Gilbert, I have shown you Plaintiffs'
22 Exhibit 1. Can you see that where you are?

23 **A.** Can you zoom in a little more? That is better.

24 **Q.** Okay. This appears to be a Fayette County official ballot
25 for, it says, the May 19 election, which I don't think

1 occurred. But it is a real ballot. But because of the virus,
2 the date changed. Just -- so bear with me on that.

3 Would you -- Clinton, would you scroll through that ballot
4 and just show how long it is.

5 Dr. Gilbert, would you agree with me that it could be very
6 hard for someone to remember all of the different races on this
7 ballot?

8 **A.** Yes, I would agree with that.

9 **Q.** And it would be virtually impossible for a voter without a
10 separate slate to be able to remember how they voted on all of
11 these; correct?

12 **A.** I don't agree with that.

13 **Q.** But if an election was left out, they would likely never
14 catch it -- correct? -- depending on the election?

15 **A.** I don't agree with that either.

16 **Q.** And the -- are you saying that a voter would remember
17 judge for the Court of Appeals between Elizabeth -- whether
18 they voted for Elizabeth Dallas Gobeil -- they would remember
19 that?

20 **A.** It depends on the voter.

21 **Q.** Okay. But your testimony depends upon the verifiability
22 and -- verifiability of the ultimate result of the election
23 depends upon most voters checking and most voters being able to
24 check; correct?

25 **A.** Correct.

1 Q. Let me direct your attention back to your testimony about
2 software independence. And you can take -- Clinton, you can
3 take this exhibit down.

4 You would agree with me that a soft -- an election system
5 must be software independent; correct?

6 A. Yes.

7 Q. And by software independent, do you mean that an
8 undetected change in software cannot cause a detected change in
9 the outcome?

10 A. That is the definition of software independence.

11 Q. And is it your testimony that BMDs -- that there cannot be
12 an undetectable change in the software?

13 A. Say that again.

14 Q. Are you saying that someone can't make an undetectable
15 change in the BMD software?

16 A. No, I'm not saying that.

17 Q. So there can be an undetectable change; correct?

18 A. There is a possibility.

19 Q. And if there is an undetectable change in the software
20 that changes the voter's choice from between the selection on
21 the screen to the BMD printout, how is that going to be
22 detected in the result?

23 A. The voter would be there first to verify the printout.

24 Q. So it is dependent entirely upon the voter's capacity,
25 ability, patience, intelligence, and the vote -- the ballot --

1 let me strike that.

2 So it is entirely dependent upon the voter; correct?

3 **A.** I wouldn't say entirely. I would say the first line of
4 defense is the voter to verify their ballot. That is the first
5 step. It is not the only step, but it is the first step.

6 **Q.** Okay. You talked about risk-limiting audits and their
7 importance to the auditing process; right?

8 **A.** Correct.

9 **Q.** And with a BMD system, a risk-limiting audit is auditing
10 what the BMD says the voter says, not what the voter says;
11 correct?

12 **A.** No.

13 **Q.** But literally it is auditing what the BMD says; correct?

14 **A.** No.

15 MR. MILLER: Your Honor --

16 **Q. (BY MR. BROWN)** Why isn't it?

17 MR. MILLER: It is the same question he just said no
18 to.

19 **Q. (BY MR. BROWN)** Why isn't it?

20 THE COURT: I agree. Go ahead.

21 **A.** It is not because that argument would suggest if I'm
22 auditing a hand-marked paper ballot I'm auditing what the ink
23 pen says.

24 **Q. (BY MR. BROWN)** That's correct. The difference is between
25 an ink pen and a computer; correct?

1 **A.** No. The difference is that the human being is controlling
2 the marks. Therefore the marks are verified on paper unless --
3 and I haven't seen this yet -- unless the paper itself has some
4 intelligence where if you write the ink on it that would be an
5 example of what you are saying. But if I look at my ballot and
6 I say this is correct, then it is not -- those are my choices,
7 not the BMD's choices.

8 MR. BROWN: Thank you, Dr. Gilbert.

9 MR. MILLER: Your Honor, if I could briefly on
10 redirect just two or three questions.

11 THE COURT: Sure.

12 REDIRECT EXAMINATION

13 BY MR. MILLER:

14 **Q.** Dr. Gilbert, there was a lot of discussion about
15 risk-limiting audits and opinions you are and are not making;
16 right? Do you know what I'm referring to?

17 **A.** Right.

18 **Q.** You wouldn't consider yourself a statistician; right?

19 **A.** Correct.

20 **Q.** And so when you are saying you are not discussing the
21 implementation and protocols of audit procedures, would
22 selecting which races to audit be included in that?

23 **A.** Correct. I'm not addressing any of that. That is not my
24 expertise. I'm not familiar with how -- the execution or the
25 accuracy of it. Again, I'm supporting our consensus committee

1 report that we should use these in elections.

2 **Q.** Thank you. And, Dr. Gilbert, you were shown a plaintiffs'
3 exhibit --

4 **MR. MILLER:** And, Bruce and David, I apologize. I'm
5 not sure what the exhibit number is. But it was 821-7, the
6 Congressional testimony.

7 **Q. (BY MR. MILLER)** Dr. Gilbert, do you recall looking at
8 that?

9 **A.** I guess. I don't know it by number. But -- I wouldn't
10 know by exhibit number.

11 **MR. MILLER:** Would plaintiffs mind putting the
12 exhibit up?

13 **MR. CROSS:** Let me see if we have it. We didn't
14 actually show it to him. It is just his testimony in his
15 declaration.

16 **MR. MILLER:** You had the screen share up of the
17 Congressional testimony.

18 **MR. CROSS:** Oh, I didn't know that. I didn't know
19 that came up.

20 All right. Clinton, can you bring that back up?

21 **(There was a brief pause in the proceedings.)**

22 **Q. (BY MR. MILLER)** Dr. Gilbert, you recall us talking about
23 this a few minutes ago; right?

24 **A.** Okay. Yes.

25 **Q.** And this was attached to your declaration; right?

1 **A.** Yes.

2 **Q.** And when you are referring to Chairperson Lofgren and
3 Ranking Members of the Committee, was that testimony you were
4 invited to present to U.S. Congress?

5 **A.** Yes.

6 **Q.** And what was the subject matter of that testimony?

7 **A.** Election security.

8 **Q.** And you can take it off the screen now. Thank you. I
9 apologize.

10 Dr. Gilbert, Mr. Brown asked you about a 160,000-vote
11 impact. Do you recall that?

12 **A.** Yes.

13 **Q.** And you testified about the number of disability voters in
14 elections; right?

15 **A.** Yes.

16 **Q.** And do you have an opinion as to whether that 160,000
17 number could apply with equal force to disabled voters voting
18 on BMDs?

19 **A.** I don't know the exact number in Georgia. I can get that.
20 We had a grant where I worked with a group of researchers from
21 Rutgers who record that every year, the number of people with
22 disabilities who participate in elections.

23 And, again, since BMDs have been introduced, that
24 technology makes it easier. We are seeing an increase. So
25 that you could have 200,000 people with disabilities voting in

1 that election in Georgia. My best guess would be you could
2 have that number, given the number of people who live in
3 Georgia and participate.

4 **Q.** And one last thing. I believe you discussed earlier with
5 Mr. Brown's hypothetical looking at a hand-marked ballot and
6 confirming that is correct; right? Do you recall that
7 discussion?

8 **A.** Yes.

9 **Q.** To your knowledge, are you aware of any hand-marked paper
10 ballot verification studies other than the study you intended
11 to conduct had COVID not occurred?

12 **A.** I'm not aware of any.

13 **Q.** And you look at a lot of these articles; correct?

14 **A.** Yes.

15 **Q.** And the subject matter?

16 **A.** Yes, I do.

17 **Q.** Dr. Byrne from Rice, Dr. Dan Wallach from Rice?

18 **A.** Yes.

19 MR. MILLER: No further questions, Your Honor.

20 MR. BROWN: Your Honor, just for the record, we
21 introduced and would like to have admitted Exhibit 1, PD 17 is
22 the demonstration table.

23 MR. MILLER: Your Honor, we would object to the
24 admission of that exhibit for its substance.

25 THE COURT: This is the data example that you gave,

1 Mr. Brown?

2 MR. BROWN: Yes, Your Honor.

3 THE COURT: All right. Well, we're going -- why
4 don't we just use it -- refer to it as a demonstrative.

5 MR. BROWN: Yes, sir. That was the intent.

6 THE COURT: Yes, Dr. Gilbert?

7 THE WITNESS: Yes. And that demonstration, if that
8 is going to be entered, I would ask that a correction be made.
9 That is not Gilbert. He was referring to a study --
10 hypothetical study that didn't include our work. If he wants
11 to see our work in this area, I'm happy to.

12 THE COURT: All right. I'm sorry. I didn't -- sir,
13 I allowed it to be used as a demonstrative, which is something
14 different than an exhibit in the record. It was used for
15 examination of you. It basically brings information out.

16 My understanding is that the original percentage was
17 based on the Rice study that was on the top column.

18 Do you disagree with that now?

19 THE WITNESS: That is my understanding as well. I
20 just don't want my name associated with a false accusation that
21 we did a study that shows that percentage. Because that is
22 not -- that is not Gilbert's work. I don't want a work
23 associated with me that wasn't my work.

24 MR. BROWN: Thank you, Dr. Gilbert. Thank you. I
25 understand your correction to that.

1 THE COURT: I just want to make sure, Dr. Gilbert.
2 Are you -- I understand that you do not view yourself as an
3 expert on auditing. But are you in any way walking back your
4 agreement with the committee's report to Congress that
5 risk-limiting audits were an essential part of accepting a
6 voting machine process that is a computerized voting machine
7 process?

8 THE WITNESS: No, not at all, Your Honor. I believe
9 risk-limiting audits should be used, whether it is a BMD or
10 hand-marked paper ballot. In both cases, you need the
11 risk-limiting audit. And it is the same reason.

12 THE COURT: Okay. Thank you.

13 All right. Can this witness be excused?

14 MR. CROSS: Yes, for our purposes.

15 THE COURT: All right.

16 MR. MILLER: Thank you, Dr. Gilbert.

17 THE COURT: Thank you very much, sir.

18 THE WITNESS: Thank you.

19 THE COURT: Who is the next witness?

20 MR. CROSS: Your Honor, our next witness is Vincent
21 Liu.

22 THE COURT: All right. This is for plaintiffs'
23 counsel. I mean, I realize that you have different clients and
24 that you explore somewhat different issues.

25 But just as a matter of time, I think you really need

1 to think about whether both of you have to examine the witness.
2 Because -- I'm not going to say you are disallowed because you
3 have different clients. But that was a substantial amount of
4 examination from both of you. And I think that it -- I think
5 you might have been able to make it shorter, frankly, if you
6 had one person who was doing it or you really decided you were
7 going to divide the topics completely.

8 MR. BROWN: Thank you, Your Honor. We hear you loud
9 and clear.

10 THE COURT: All right. All right. Is Dr. Liu with
11 us?

12 THE WITNESS: Yes. Can you guys hear me?

13 THE COURT: I'm looking for him at this point.

14 THE WITNESS: Can you guys hear me okay?

15 THE COURT: Yes.

16 THE WITNESS: Okay. Great.

17 THE COURT: I want to make sure the court reporter
18 can hear you.

19 You are fine, Ms. Welch?

20 COURT REPORTER: Yes, ma'am.

21 THE COURT: Mr. Liu, would you -- or, Dr. Liu, would
22 you raise your right hand.

23 **(Witness sworn)**

24 THE COURT: And state your name and location.

25 THE WITNESS: Vincent Liu, San Francisco, California.

1 THE COURT: Thank you very much.

2 Plaintiffs' counsel, who will be examining Dr. Liu?

3 I'm sorry. Which plaintiffs' counsel will be --

4 MR. CROSS: Eileen, come back over here. I'm sorry.

5 We were trying to do it in separate spaces. She's coming.

6 MS. BROGAN: Forgive me, Your Honor. We were trying
7 to use the second room. And our tech problems persist.

8 THE COURT: All right.

9 MS. BROGAN: May I?

10 THE COURT: Go ahead.

11 Whereupon,

12 VINCENT LIU,

13 after having been first duly sworn, testified as follows:

14 DIRECT EXAMINATION

15 BY MS. BROGAN:

16 **Q.** Mr. Liu, the Court has your CV. It was submitted with
17 your declaration.

18 THE COURT: I'm sorry. Could you go ahead and
19 introduce yourself for the record.

20 MS. BROGAN: Forgive me. I'm Eileen Brogan on behalf
21 of Curling plaintiffs.

22 THE COURT: Go ahead.

23 **Q. (BY MS. BROGAN)** Mr. Liu, as I was saying, the Court, I
24 think, has your CV, and it is generally aware of your
25 qualifications. So I would ask that you just briefly describe

1 your background and experience.

2 **A.** Sure. Absolutely. I have been in cybersecurity
3 specifically focused in the offensive space -- offensive side
4 of security for 21 years. After high school, I went to work
5 with the National Security Agency as a global network
6 exploitation analyst.

7 After which, I went to work with Ernst & Young in their
8 advanced security centers as a consultant. And I led the
9 global penetration testing team for Honeywell International and
10 in 2005 cofounded Bishop Fox until today where I am the CEO.

11 **Q.** And can you briefly describe what type of work you do in
12 the cybersecurity sphere at Bishop Fox?

13 **A.** Yes. We are hired by some of the most sophisticated,
14 largest companies in the world to perform product security
15 testing, application security testing, penetration testing,
16 code reviews, red teaming. Essentially companies hire us to
17 find vulnerabilities within their systems to identify
18 weaknesses.

19 And we do this for 8 of the top 10 technology companies in
20 the world, 10 of the top 20 retailers, 5 of the top 5 media
21 companies. The problems we solve, the things we do include,
22 for example, this Zoom call that we are on.

23 MS. BROGAN: Thank you.

24 Your Honor, we would ask defendants to stipulate to
25 Mr. Liu as an expert in computer science with a focus on

1 cybersecurity. And as I understand, Mr. Tyson doesn't have an
2 objection.

3 MR. TYSON: That is correct, Your Honor. We don't
4 have an objection to having Mr. Liu testify as a computer
5 science expert with a focus on cybersecurity.

6 THE COURT: All right. I'll accept it.

7 MS. BROGAN: Thank you.

8 **Q. (BY MS. BROGAN)** Mr. Liu, have you had an opportunity to
9 review the two declarations submitted by State defendants for
10 Mr. Cobb in this matter?

11 **A.** Yes, I have.

12 **Q.** Mr. Cobb addresses this issue of whether the QR codes
13 produced by the BMDs are encrypted.

14 Have you done your own analysis to determine whether the
15 QR codes are encrypted?

16 **A.** Yes. Yes, I have.

17 **Q.** And what did you find?

18 **A.** In examination of the QR codes, we identified that the QR
19 codes were not encrypted, certainly not with any known
20 industry-accepted standard algorithm.

21 And the process that we undertook to perform the
22 verification was to develop code that read the QR code.
23 Wherein, we were able to extract the raw data and determine
24 that it was -- whether or not it was encrypted. And our
25 conclusion was that it was not.

1 Q. And what did you understand Mr. Cobb to say with respect
2 to encryption of these QR codes?

3 A. In his -- I believe it is in his declaration he states
4 that these QR codes are signed and encrypted. And that is not
5 a correct statement.

6 Q. In his second declaration, does he continue to suggest
7 that the QR codes are encrypted?

8 A. I would need to -- I would, yeah, probably want to take a
9 look at that second declaration to understand exactly which
10 section you are referring to.

11 Q. Sure. Okay.

12 A. But certainly in the first one, he does make that
13 statement. And it is not correct.

14 Q. Okay. Actually, we could pull up -- let me ask it this
15 way: Do you understand a distinction between QR codes that are
16 encrypted and QR codes that are encoded?

17 A. Yes. There is a big distinction. It is a fundamental
18 distinction. Coding and encryption are two very different
19 things.

20 Q. So if Mr. Cobb had walked back his analysis that the QR
21 codes were encrypted and now suggests that they are encoded,
22 would that make a difference?

23 A. Yes. And I think if that is what you are referring to,
24 Mr. Cobb does state in his second declaration that they are
25 encoded and not encrypted.

1 In fact, I think you are referring to the part where he
2 talks about it being semantics. And it is not. Actually, I
3 would disagree with that. It is not a minor point about
4 semantics at all. It is a very basic but fundamental
5 distinction between the two of them.

6 The use of encryption implies that there is an algorithm
7 that confers some measure of security to the system. Encoding
8 does not. Encoding is actually quite different. It confers
9 usability. It is designed and often used for interoperability.
10 It does not provide security to a system. So --

11 THE COURT: I'm sorry. Let me just interrupt you for
12 a second. It is used for -- you used a word, and I just didn't
13 hear it.

14 THE WITNESS: Yes. It may be a term of art within
15 the industry. Maybe a way to think about it is encryption is
16 used to provide for security. Encoding is intended and
17 designed for usability. It is to make information more easily
18 accessible, which is oftentimes counter to, say, encryption,
19 which is something more secret. It is -- I mean, it is a
20 concept that is very, very fundamental.

21 **Q. (BY MS. BROGAN)** And what about digital signatures? Do
22 they play any role?

23 **A.** Yes. So, you know, typically when you are thinking about
24 digital signatures, you are referring to the use of public-key
25 cryptography. And the intention is to provide for integrity.

1 In this case, public-key cryptography was not being used
2 with QR codes. And so the implication is that with the BMDs
3 and the generation of the QR codes the QR codes themselves --
4 the implication with the design of the Dominion BMD system is
5 that any device that has necessary keys to operate would be
6 able to generate a fake QR code. And you would not be able to
7 determine which machine generated it, whether it was the EMS,
8 the BMD, the ICP, or any other system that had that key loaded
9 on to it.

10 **Q.** I would also like to ask you about the paragraphs of
11 Mr. Cobb's supplemental declaration where he indicates he is
12 responding directly to you.

13 If it is helpful, we can just pull up that section of the
14 declaration. It is marked as Plaintiffs' Exhibit 29.

15 **A.** Yeah. Would that be all right to pull it up as reference?

16 MS. BROGAN: Clinton, could you pull that PX 29 up.

17 **Q. (BY MS. BROGAN)** On the bottom of Page 4, Mr. Cobb
18 indicates he is replying to Mr. Liu. And then it continues on.

19 Mr. Cobb stated in his original declaration that Georgia's
20 voting system has a hash value that would make it impossible to
21 detect alterations to the software.

22 THE COURT: I'm sorry. I don't see where you are
23 reading from.

24 MS. BROGAN: I'm sorry, Your Honor. I am -- this is
25 already in the record. This is from Mr. Cobb's original

1 declaration.

2 THE COURT: All right. Fine.

3 MS. BROGAN: Forgive me.

4 THE COURT: That is all right.

5 **Q. (BY MS. BROGAN)** So Mr. Cobb stated that Georgia's voting
6 system has a hash value that would make it possible to detect
7 alterations to the software.

8 Do you recall responding to that in your declaration?

9 **A.** Yes, I do.

10 **Q.** How did you respond to that statement?

11 **A.** Yeah. The check that Mr. Cobb describes I think I
12 characterized as security theater. The verification of a
13 checksum in that manner is rife with issues. An infected BMD
14 system could very easily report any value that it wanted to.

15 I guess an analogy would be giving somebody a test, asking
16 them to grade it for themselves, and then asking them to report
17 the -- to self-report the results. And if you have an infected
18 BMD that has been compromised, it can just tell you whatever
19 value that it wants.

20 So that check -- I mean, that type of exploit is commonly
21 used to bypass verification systems. It is seen in the wild.
22 It is things that we do as part of our professional work.

23 **Q.** And do you have an understanding -- particularly with
24 respect to these Paragraphs 13 and 14, do you have an
25 understanding of how Mr. Cobb is responding to that opinion you

1 just shared, that the malware can circumvent the check and that
2 you are relying on a compromised system to check itself? Do
3 you understand his response in these paragraphs?

4 **A.** Yes. When I reviewed his response, I think actually in
5 Article 12 or Paragraph 12, he says he's not going to respond
6 to all of the allegations. I only make two claims. So he is
7 simply ignoring the first claim or choosing not to respond to
8 the first claim.

9 What he does respond to is the second claim around QR code
10 security. It is interesting because if you read it -- when I
11 first read it, it looked like he was trying to respond to and
12 point out a specific technical issue or, you know, flaw in the
13 reasoning.

14 He does not, in fact. He is actually really only pointing
15 out not a question of whether the QR code can be faked but when
16 it can be faked. And he is simply saying that in order for the
17 QR code to be faked, the BMD or other systems would need to
18 have a key provided to it from the EMS system.

19 And that is true. That key needs to be provided from the
20 EMS to the BMD before the start of any election. An election
21 can't run without that key. So, again, it is not a matter of
22 whether it can happen. It is just a matter of when. And
23 whenever that election worker, that poll worker loads that key
24 before an election on to those systems, which it has to do,
25 then whether it is two weeks or two days before or two minutes

1 before the election starts, at some point those systems will
2 have to have the material that is necessary. And they will be
3 able to fake a QR code.

4 THE COURT: Will be able to what?

5 THE WITNESS: Fake the QR codes.

6 THE COURT: Fake the QR codes. Okay.

7 THE WITNESS: In a way that the other readers can't
8 detect.

9 MS. BROGAN: Thank you, Mr. Liu.

10 Your Honor, I have nothing further.

11 THE COURT: Thank you.

12 MR. TYSON: Are you ready for me, Your Honor?

13 THE WITNESS: Yes.

14 CROSS-EXAMINATION

15 BY MR. TYSON:

16 **Q.** Good morning, Mr. Liu. My name is Bryan Tyson. I
17 represent the State defendants. I just have a couple of quick
18 questions for you.

19 You mentioned that you examined QR codes as part of your
20 analysis here. What QR codes did you examine?

21 **A.** We were provided with a sample ballot I believe -- I
22 believe potentially from one of the elections. I would need to
23 look at the exact source. I believe it was produced by a
24 Dominion system.

25 **Q.** Was it for an election in Georgia, or was it just a

1 Dominion ballot generally?

2 **A.** I would need to double-check where the source of that was.
3 It was provided as part of an overall package of information
4 pertaining to this case.

5 **Q.** And provided by the plaintiffs' counsel to you; correct?

6 **A.** That's correct.

7 **Q.** And you have never personally examined the Dominion BMD
8 system being used in Georgia; correct?

9 **A.** Can you clarify that question? There is a number of
10 different ways. And I'll help you with that. But there's a
11 number of different ways that we can actually examine the
12 system.

13 Do you mean physically in person, remotely -- or there is
14 a method of examination which is through documentation and
15 architectural analysis. I'm not exactly sure what you are
16 asking.

17 **Q.** Certainly. Let me just break it into pieces. Have you
18 ever physically examined a Dominion -- any component of a
19 Dominion BMD system in Georgia hands-on?

20 **A.** I have not.

21 **Q.** Have you ever analyzed the software of any component of a
22 BMD system in Georgia?

23 **A.** I have not.

24 **Q.** And you don't have any personal knowledge about how
25 encryption keys are handled by the Dominion BMD and ICP

1 scanners, do you?

2 **A.** I do.

3 **Q.** And where did you obtain that knowledge?

4 **A.** So this is a third method of performing a security
5 assessment. It is a technique that is called threat modeling
6 architectural review. This is the process that we used in this
7 case whereby we reviewed documentation, we examined the
8 behavior of the systems, and we examined the artifacts of it in
9 order to determine the behaviors.

10 And this is the method in which we determined that QR
11 codes, for example, in this situation were not being encrypted.
12 And so that model called threat modeling or architectural
13 analysis looking at some of the byproducts is a commonly used
14 technique in the industry.

15 **Q.** So your opinions are based on a review of the QR codes
16 that you were provided by plaintiffs' counsel in the
17 documentation for the system; is that fair to say?

18 **A.** Documentation of the system, reports that we have reviewed
19 from Pro V&V, other reports that we have seen online, things of
20 that nature from various certification bodies. Yes.

21 **Q.** And you have never seen actual malware that would produce
22 a false checksum in a Dominion BMD; correct?

23 **A.** In a Dominion BMD, no.

24 **Q.** And you would agree that a hash comparison using a SHA-256
25 checksum is a valid way of determining whether software has

1 been modified setting aside -- as a general proposition;
2 correct?

3 **A.** Yeah. You have to be really careful when you make that
4 statement. I think it oversimplifies the whole process. So
5 without context, I mean, you could say sort of in a vacuum that
6 is true. It would be like saying encryption can be secure.

7 But it all comes down to implementation. And I would
8 qualify that by saying, yes, the use of SHA-256 as a hashing
9 function is currently known to be an acceptable standard. But
10 as it is deployed within the Dominion devices, it does not
11 appear to be used in a fashion that could be considered secure.
12 It can be easily circumvented.

13 **Q.** And that is based on your review of documentation, not
14 based on actual analyzing how the SHA-256 hash value is created
15 by the BMD; correct?

16 **A.** Can you clarify that question?

17 **Q.** Yes. You stated that the implementation was key and that
18 it may be a valid way to do it. But I just want to clarify:
19 You haven't personally examined the software of a BMD beyond
20 the documentation to reach that opinion, so you are proposing
21 something, but you don't know that for certain; correct?

22 **A.** Yes and no. I'm familiar with the version of Android that
23 is being used by the BMD system. I'm familiar with the general
24 principles of how the software checksum works. Both of those
25 data points -- those are hard data points -- indicate to me

1 that the implementation of malware would be feasible.

2 But I have not -- to also answer your question, I have not
3 developed malware, for example, which is an example of
4 something we could do because we don't have access to a system
5 currently. I could develop malware that would circumvent the
6 checksum result.

7 MR. TYSON: Thank you. I don't have any further
8 questions.

9 MS. BROGAN: Nothing further, Your Honor.

10 EXAMINATION

11 BY THE COURT:

12 **Q.** Dr. Liu, I just want to follow up on Mr. Tyson's question.
13 In the course of your consulting and performance of your
14 security vulnerability assessments, do the techniques that you
15 just identified meet the assessment of the architectural
16 structure and documentation of routine method that you use for
17 assessing vulnerability of the software?

18 **A.** Yes.

19 **Q.** The hacking?

20 **A.** It is usually how we start almost every engagement that is
21 a little bit more sophisticated is understanding the lay of the
22 land and using documentation to understand how a system works.
23 And then our job is to figure out how it doesn't work. So that
24 involves, of course, needing to know what is right so we can
25 determine what is wrong.

1 **Q.** So we are using documentation to identify what is wrong or
2 potentially wrong or access points. I guess what you are doing
3 is -- if my understanding is right is that you are looking at
4 the architecture and documentation to identify specific
5 vulnerabilities that might be exploited and basically
6 compromise the functioning of the technology or computer?

7 **A.** Yes, Your Honor. I think a good way to think about it is
8 a lot of the Dominion software, a lot of the fundamental
9 technologies that are being used -- not just with Dominion --
10 but just everywhere are very similar.

11 And to kind of think about it, the law of physics doesn't
12 change in Georgia as compared to the State of California. They
13 all fly. We're using the same technology, the same techniques,
14 the same approaches.

15 So needing to have hands-on experience with a very, very
16 specific version of a thing is important in limited cases. But
17 you can -- you can generally predict how a ball is going to
18 drop and how gravity will work in California versus Georgia.

19 **MR. TYSON:** Your Honor, could I ask one follow-up for
20 that?

21 **THE COURT:** Yes.

22 **RE-CROSS-EXAMINATION**

23 **BY MR. TYSON:**

24 **Q.** Mr. Liu, in your work with your company and in your past
25 work in cybersecurity, have you ever encountered a software

1 and/or hardware system that didn't have any vulnerabilities?

2 **A.** I don't think anybody professionally would ever say that
3 any system is ever free of vulnerabilities. But certainly we
4 have performed assessments in the past where they have been
5 very well hardened. And within a certain time frame of testing
6 that we have undertaken within a time frame that was provided
7 we were not able to identify any vulnerabilities.

8 MR. TYSON: Thank you.

9 REEXAMINATION

10 BY THE COURT:

11 **Q.** So I guess the question I have is: What you identified as
12 to the QR code that you said was accessible and that it really
13 had only been encoded -- did you consider that a fundamental
14 problem or not or is this just like everyone has -- everyone
15 has pimples? I hate to use that or every teenager.

16 **A.** I have been asked about the QR code specifically in this
17 testimony. It is important to understand the broader context
18 of how these QR codes are being used and the overall system
19 because it is related. It is related to the installation of
20 software on the BMD. It is related to how the QR code is being
21 read on the ICP. It is an entire ecosystem.

22 What I would say is that the intent of the QR codes is
23 that they represent voter intent. Right? They are
24 representing -- I think that is the point maybe of what you are
25 trying to get to.

1 The concern that I would have in a system like this and
2 what I would tell a client is that the design of the -- the
3 design of the security system in this situation is not
4 something I would call secure. I think the votes can be
5 tampered with. I think the BMD devices really require a much
6 more in-depth review. It is using very outdated software.

7 I would definitely not recommend -- I would never
8 recommend anybody use an Android operating system or kernel
9 that is over half a decade out of date containing known
10 vulnerabilities. We have clients that, you know, I think are
11 running an Android 4 -- kernel version 4 or Android version 5.
12 We have had clients recently just say, oh, the software is
13 running Android version 7. We're not even going to consider --
14 don't even bother testing it.

15 So there is a lot of other problems that are going to get
16 exacerbated.

17 THE COURT: Thank you.

18 Counsel, would you also identify for us what was the
19 ballot? Was it a Georgia ballot? What was the ballot -- or a
20 ballot from another jurisdiction using the same type of QR code
21 because they were using also a Dominion BMD or --

22 MS. BROGAN: Your Honor, it was from what was
23 produced to us from Fulton County.

24 THE COURT: Okay. Thank you.

25 MR. TYSON: Could I ask one additional follow-up in

1 light of that discussion?

2 THE COURT: Yes.

3 RE CROSS-EXAMINATION (Further)

4 BY MR. TYSON:

5 **Q.** So, Mr. Liu, you said that a security analysis would
6 require a more in-depth review. I just want to clarify. I
7 believe we have.

8 You have not undertaken that in-depth review at this
9 point; right?

10 **A.** That is correct. We haven't had access to the software or
11 the systems as of yet. Although we would welcome the
12 opportunity to do so.

13 **Q.** And as part of that review, you would include, I'm
14 assuming, physical security, along with operational usage, in
15 addition to the software and other factors; correct?

16 **A.** Yes. In this situation, I would definitely include
17 physical security. My understanding is that there are
18 mechanisms that the election workers can use to transfer
19 encryption keys on to the devices with eye buttons and USB
20 devices.

21 I mean, USB devices is fraught with security concerns. We
22 actually have a video on our website of research that we
23 performed three or four years ago where we were able to effect
24 an attack where you walk up to a digital safe that is being
25 used at a retail location that is holding cash inside, you

1 know, fast food chains or retail locations. And in 60 seconds,
2 it pops open the safe after -- 60 seconds after dropping the
3 USB into the system, the safe opens up and you can remove all
4 the cash. Those are definitely attack factors I would examine
5 much more closely.

6 **Q.** So you would agree that physical security is an important
7 factor when considering the overall security of the election
8 system; right?

9 **A.** Yes. One of many factors.

10 MR. TYSON: Thank you. I don't have any further
11 questions.

12 THE COURT: Can this witness be excused?

13 MS. BROGAN: Thank you, Your Honor.

14 THE COURT: Thank you very much. I appreciate
15 your -- I know you are on a different coast and a whole other
16 hour. So thank you very much. You will have a prompt start to
17 your day, to say the least.

18 THE WITNESS: My pleasure. Thank you.

19 THE COURT: All right. Thank you.

20 Who is your next witness?

21 MR. McGUIRE: Your Honor, plaintiffs would like to
22 call Dr. Coomer, if he is on the line.

23 THE COURT: All right. I need to get a glass of
24 water. So would you give me one minute before we begin? Thank
25 you.

1 **(A brief break was taken.)**

2 THE COURT: Mr. McGuire, do you want to call your
3 next witness here?

4 MR. MCGUIRE: Yes, Your Honor. The plaintiffs would
5 call Dr. Eric Coomer.

6 THE WITNESS: I am on the line.

7 THE COURT: All right. Mr. Coomer, would you raise
8 your right hand.

9 **(Witness sworn)**

10 THE COURT: Thank you very much. State your
11 location.

12 THE WITNESS: Location? I'm in Salida, Colorado.

13 THE COURT: Thank you very much.

14 MR. RUSSO: Your Honor, one quick matter. The State
15 defendants are also planning to call Dr. Coomer on our direct.
16 I understand, of course, plaintiffs would like to cross
17 Dr. Coomer. But I did want to make that note.

18 THE COURT: Thank you very much.

19 MR. MCGUIRE: May I proceed?

20 THE COURT: Yes.

21 Whereupon,

22 ERIC COOMER, PH.D.,

23 after having been first duly sworn, testified as follows:

24 CROSS-EXAMINATION

25 BY MR. MCGUIRE:

1 Q. Dr. Coomer, hi. My name is Robert McGuire. I'm counsel
2 for the Coalition plaintiffs in this case.

3 First question, can you hear me clearly?

4 A. Yes, I can.

5 Q. Okay. Thank you. You are the director of products
6 strategy and security for Dominion Voting Systems?

7 A. That is correct.

8 Q. I want to begin by asking you about the plaintiffs'
9 concerns in this case that the Dominion scanners are not
10 counting all the votes.

11 Are you and Dominion aware that voter markings that are
12 obvious votes to human eyes are being disregarded on central
13 count scanners due to settings that degrade the image quality?

14 A. I do not agree with that statement, no.

15 Q. Okay. You disagree that votes are being discarded by the
16 scanner that humans would interpret as votes?

17 A. Nothing is being discarded from the system. We are
18 capturing the percentage fill of the targets for every mark
19 that is made on the ballot. That has absolutely nothing to do
20 with the scanner resolution, the DPI setting.

21 Whether a mark is characterized as a ballot vote, an
22 ambiguous mark, or not a vote is wholly dependent on the
23 threshold settings of the lower and upper threshold limits as
24 well as the percentage fill of the target detected by the
25 system.

1 Q. So does that mean you would not count something as a vote
2 if to a human eye it looks like a vote?

3 A. No, that is not what it means at all. What it means is
4 the system is simply scanning the image and detecting the
5 percentage fill of the target area. Based on the settings, it
6 will automatically say whether it is a valid counted vote,
7 whether it is an ambiguous mark, or whether we don't
8 characterize it as any.

9 There are further processes in the system, mainly
10 adjudication, which allows secondary review -- voter review for
11 voter intent issues, which is integral to the system, which is
12 where you can apply voter intent guidelines and processes to
13 essentially characterize a vote that the system is not
14 automatically specifying as a vote.

15 MR. McGUIRE: Okay. Can I ask Clinton to put up
16 Exhibit PX 7, which was introduced yesterday into evidence?

17 Let's see. Clint, could you scroll to the -- scroll
18 down just a bit.

19 Q. (BY MR. McGUIRE) So, Mr. Coomer, do you see that where it
20 says the race for sheriff? It says Theodore "Ted" Jackson. Do
21 you see that?

22 A. Yes, I do.

23 Q. And you see that mark there?

24 A. Correct.

25 Q. Now, to your eyes as human, does that look like a vote?

1 **A.** I would say it does, yes.

2 **Q.** Okay. Let's go to the next page, please. Now, you see --
3 you see there where it says dem sheriff blank contest?

4 **A.** I do.

5 **Q.** That means that the Dominion system with the threshold
6 settings did not interpret that mark which you thought was a
7 vote to be a vote; correct?

8 **A.** Not the Dominion system. The ImageCast central scanner
9 did not count that as a vote at scan time.

10 **Q.** And it is not marked as ambiguous, is it?

11 **A.** We do not include ambiguous marks in the AuditMark. The
12 AuditMark is simply showing every vote that was counted as a
13 vote.

14 There is additional metadata outside of the AuditMark that
15 we characterize ambiguous marks and also mark densities that
16 are used in the adjudication system, which is part of the
17 Dominion system.

18 So when you say the Dominion system is not recognizing
19 this as a vote or an ambiguous mark, that is an incorrect
20 statement.

21 **Q.** Okay. So the central count scanner, the ICC did not
22 recognize this mark as a vote?

23 **A.** That is correct.

24 **Q.** Okay. Let's go back up to Page 1, please. So looking at
25 the vote for -- and scroll down to Ted Jackson -- the vote for

1 Ted Jackson.

2 You can't tell from this ballot whether or not that mark
3 went to adjudication, can you?

4 **A.** Not from this image, no.

5 **Q.** Are you aware that a similar dynamic happens for
6 hand-marked paper ballots that are scanned by the precinct
7 scanners?

8 **A.** It is slightly different on the precinct scanners.
9 Because the voter is actually physically feeding in the ballot,
10 the ImageCast precinct will actually not accept any ballot with
11 an ambiguous mark on it. So it is a slightly different
12 behavior between the precinct and the central count.

13 **Q.** And the voter would be alerted if there is an ambiguous
14 mark; right?

15 **A.** That's correct.

16 **Q.** And the voter would be alerted if there is an overvote;
17 right?

18 **A.** That's correct.

19 **Q.** Okay. Now, my understanding is that the voter would not
20 be alerted if there is an undervote; is that right?

21 **A.** That is currently how it is configured in Georgia. The
22 system is fully capable of notifying voters of undervotes as
23 well.

24 **Q.** Okay. But as it is configured now in Georgia, the system
25 doesn't notify voters if there is an undervote in any contest?

1 **A.** That is correct. It does --

2 **Q.** On the precinct count scanners?

3 **A.** That is correct. It also does -- I just want to be -- for
4 completeness, it does warn if the ballot is completely blank.

5 **Q.** Okay. And that would be if all the races were empty?

6 **A.** Correct.

7 **Q.** Okay. You understand that the plaintiffs in this case are
8 arguing to the Court that in-person voting should be conducted
9 using hand-marked paper ballots as the default voting method?

10 **A.** I am aware of that, yes.

11 **Q.** Okay. Are you aware that the plaintiffs are also arguing
12 that the high volume scanner settings that you discussed just a
13 moment ago should be adjusted to ensure that all votes are
14 counted? Do you understand that that is the plaintiffs'
15 contention?

16 **A.** I know that they want to -- that they are asking for those
17 thresholds to be changed. I'm a little confused when you say
18 that all votes are counted. Because that is -- that is a
19 logical fallacy that I am not sure where that -- what that
20 statement really means.

21 **Q.** That is because in your eyes a vote is discerned by
22 whether or not there is a certain percentage of black that the
23 scanner perceives; correct?

24 **A.** No, that is not at all what I'm saying. So the percentage
25 still is used for the scanners to make the -- let's say the

1 first-pass determination of what is a vote and what is not a
2 vote. In any system that has hand-marked paper ballots, there
3 is a process by which you need to consider voter intent. So it
4 is not -- that is not a simple statement.

5 **Q.** Understood. But you would agree that if a voter's
6 markings -- however they did it, if a voter's markings do not
7 exceed your minimum threshold to call it ambiguous, that mark
8 will be disregarded by the scanner?

9 **A.** It will not be counted as a vote. I take issue with
10 disregarded. The scanner will not mark it as a vote if it is
11 above the upper -- if it is not above the upper threshold.

12 If it is between the thresholds, the scanner will mark it
13 as ambiguous. If it is below the lower threshold, it does not
14 register as either ambiguous or a vote.

15 MR. MCGUIRE: Okay. Clint, we can take down the
16 exhibit, please.

17 THE COURT: Let me just follow up on that for a
18 second. I would normally wait. But since we just had the
19 exhibit up, I want to understand.

20 So when the vote there was for Mr. -- the candidate
21 Ted Jackson and it was declared blank on the next -- on the
22 other page we saw, then that basically means it is not going to
23 be -- it is not going to be identified as something for
24 adjudication; is that right?

25 THE WITNESS: No, that is incorrect.

1 THE COURT: All right. So then what -- tell me what
2 is incorrect about that.

3 THE WITNESS: So just because it says blank contest
4 in the AuditMark does not mean that the system did not identify
5 that as an ambiguous mark for sending to adjudication.

6 I would have to see more data from this. I can say
7 that I have a high confidence -- just an anecdotal confidence
8 that that mark would be sent to adjudication.

9 Again, just to clarify, the AuditMark simply shows
10 everything that was counted as a vote. There is additional
11 metadata in the cast vote record, which is the electronic
12 record, that includes information about ambiguous marks. And
13 that is the data that is used to determine whether it is sent
14 to adjudication, not the audit.

15 **Q. (BY MR. McGUIRE)** If I may, Mr. Coomer, if the vote -- if
16 the --

17 **A.** Dr. Coomer.

18 **Q.** I'm sorry. Dr. Coomer. Apologies.

19 If the ballot in this particular case had been adjudicated
20 to be a vote, would that adjudication show up on this
21 AuditMark?

22 **A.** Yes, it would.

23 **Q.** And we don't see it here, do we?

24 **A.** Yeah. I don't know where this image came from. So I'm
25 not sure that this is either post- or pre-adjudication. So I

1 can't make any statements on that.

2 **Q.** But if it had been adjudicated in the course of a normal
3 election process, you would have seen that on the AuditMark in
4 front of us; right?

5 **A.** Yes. Yes.

6 **Q.** Okay. So I would like to turn to precinct scanners, and
7 we can take that exhibit down.

8 Dr. Coomer, Dominion's precinct scanners are generally
9 used to scan BMD ballots; right?

10 **A.** Can you be more specific?

11 **Q.** Well, the precinct -- in the precincts most of the ballots
12 that are scanned on the precinct scanners are ballots printed
13 from BMDs?

14 **A.** In Georgia, that is a correct statement.

15 **Q.** But the scanners -- the precinct scanners are capable of
16 scanning and tabulating in the precincts hand-marked paper
17 ballots, are they not?

18 **A.** Correct.

19 **Q.** Now, you recently submitted a declaration at Document
20 834-1. I'm going to read to you -- I can show it to you. I
21 don't actually have it as an exhibit. But I can share my
22 screen and show it to you so you can follow along with what I'm
23 reading, assuming that I can do this.

24 If you can tell me when that comes up for you.

25 **A.** I can see it now.

1 **Q.** I have highlighted there Paragraph 5. And it says, there
2 are a limited number of ballot printers in the United States
3 that are qualified to print absentee and mail ballots for use
4 in the Dominion Democracy Suite. The total number of qualified
5 printers is 34, and there is only one qualified printer in the
6 State of Georgia.

7 Did I read that correctly?

8 **A.** Yes, you did.

9 **Q.** Okay. Now, you wrote that to support the State's argument
10 that it is not feasible for Georgia to print enough ballots to
11 conduct a statewide election in which in-person voters use
12 hand-marked paper ballots; correct?

13 **A.** I can say that I wrote that because that is the fact of
14 the state of qualified printers.

15 **Q.** Okay. Now, did you contact any of the 34 qualified
16 printers to ascertain whether there was enough printing
17 capacity to print enough paper ballots to run a statewide
18 election in Georgia?

19 **A.** Not specifically. But I can say that we are having daily
20 calls with our printers due to capacity issues in general for
21 the entire election in November.

22 **Q.** But you haven't asked any of them about their ability to
23 fill a need in Georgia if this Court were to order hand-marked
24 paper ballots?

25 **A.** Not specifically for Georgia, no.

1 Q. Okay. What makes a printer, quote-unquote, qualified to
2 print absentee and mail ballots?

3 A. We have a whole qualification process. It is basically a
4 set of tests, quality controls, access controls, various things
5 that we assess for a given printer. They have to do a set of
6 test ballots, and we have to make sure that they can accurately
7 print and reproduce our ballots for accuracy and our standards.

8 Q. And so that is a Dominion qualification?

9 A. Yes, it is.

10 Q. Okay. And what legal requirement do you know, if you
11 know, requires Georgia to use only a qualified -- ballots that
12 are produced by a qualified ballot printer?

13 A. I'm not aware of any Georgia statute that requires a
14 Dominion qualified printer. But I can say that we as a company
15 would not use an unqualified printer.

16 Q. Okay. Now, the precinct tabulators, they are ordinary
17 off-the-shelf printers; right?

18 A. I'm sorry. Could you repeat that.

19 Q. Yes. The precinct tabulators that are used in Georgia,
20 they are hardware that is ordinary off-the-shelf hardware;
21 right?

22 A. No. The tabulator is proprietary Dominion -- the
23 ImageCast Precinct is a proprietary Dominion product.

24 Q. Okay. So are you aware that plaintiffs have had the
25 opportunity to test one of those printers since last Friday?

1 **A.** I am aware that representatives for the plaintiffs have
2 access to the precinct equipment. I can't characterize what a
3 test is.

4 **Q.** Okay. Would you -- would it surprise you to learn that
5 the plaintiffs --

6 **MR. TYSON:** Your Honor, I'll object right here. I
7 think we're getting into the scope of the testing again. And
8 we went over this yesterday. I don't think this is the proper
9 place to bring this in.

10 **THE COURT:** I don't know that he is getting into
11 testing.

12 **MR. McGUIRE:** Correct, Your Honor. If I may just ask
13 one or two questions, it will be clear. I'm getting to
14 feasibility.

15 **Q. (BY MR. McGUIRE)** Are you aware that the Dominion precinct
16 scanner will accept and scan ordinary photocopies of ballots?

17 **A.** I'm aware that the precinct scanner will accept a valid
18 ballot.

19 **Q.** Okay. Are you aware that it will accept a photocopy of a
20 valid ballot?

21 **A.** Potentially, yes.

22 **Q.** Okay. So even if there weren't capacity among your
23 qualified printers, wouldn't it be possible for any commercial
24 printer to provide acceptable ballots for Georgia to use?

25 **A.** No, I can't agree with that statement at all. No.

1 Q. Okay. Let's switch to the central scanning. I'm going to
2 ask -- let me go back to -- am I still sharing my screen with
3 you? Do -- you still?

4 A. Yes, you are.

5 Q. I'm going to highlight Paragraph 4.

6 In Paragraph 4, you wrote, scanner threshold settings for
7 the Dominion Democracy Suite that Georgia purchased are not set
8 on each individual scanners. Instead, scanner threshold
9 settings are set when the voting database is built. Users are
10 not able to change the threshold settings without being trained
11 to do so and with the appropriate application access
12 privileges.

13 Did I read that right?

14 A. Yes, you did.

15 Q. Okay. We can take that -- actually, I can take that down.
16 Let me just do that.

17 Dr. Coomer, does this statement apply equally to precinct
18 scanners and high capacity scanners or just one or the other?

19 A. No. It is for both.

20 Q. Okay.

21 A. There's actually individual settings for each scanner
22 type.

23 Q. Okay. Now, I understand from your statement in your
24 declaration here that --

25 THE COURT: Could you give me the document number

1 again? I'm sorry.

2 MR. McGUIRE: Yes, Your Honor. It is 834-1.

3 **Q. (BY MR. McGUIRE)** Now, Dr. Coomer, do you dispute
4 whether -- is it your contention that counties could not change
5 their central scanner settings before the November election if
6 this Court orders it?

7 **A.** No, that is not my statement at all.

8 **Q.** So that -- and that is not a statement you would make?

9 **A.** No.

10 **Q.** Okay. So if this Court orders it, the settings on the
11 central count scanners could be changed feasibly?

12 **A.** Yeah. Before the project is built. I mean, we are in the
13 midst of building the project. So there is -- there is a time
14 when you can't easily change the settings.

15 **Q.** Okay. I'm going to ask you next about the version of
16 Democracy Suite that is running in Georgia. That version is
17 designated as Democracy Suite 5.5-A and parenthesis GA;
18 correct?

19 **A.** Yes.

20 **Q.** Now, is that version certified by the EAC?

21 **A.** Yes, it is.

22 **Q.** It is certified under that name 5.5-A parenthesis GA?

23 **A.** I believe the official certification is under 5.5-A, which
24 is the same as 5.5-A parenthesis GA.

25 **Q.** If it is the same, then why does it have a different

1 designation?

2 **A.** I think we did that when we submitted it to the Georgia
3 certification effort.

4 **Q.** Okay. So it wasn't because the software for the ImageCast
5 central scanner changed?

6 **A.** No.

7 **Q.** Okay. So the ImageCast central scanner software under
8 5.5-A (GA) is the same software that the EAC certified under
9 5.5-A?

10 **A.** That's correct.

11 **Q.** Okay. Dr. Coomer, the original delivery date for counties
12 in Georgia to receive the Dominion EMS servers was August of
13 2019; right?

14 **A.** If you say so. I don't -- I don't know offhand by memory
15 all of the operational delivery dates of systems across the
16 U.S.

17 **Q.** Now, there has been evidence in this case that those
18 deliveries were -- many of them were delayed until February and
19 March of 2020, so six months approximately.

20 Do you know anything about that?

21 **A.** Only peripherally. Again, I'm not -- I'm not the
22 operations implementation expert.

23 **Q.** What is your understanding briefly of why that delay
24 happened?

25 **A.** Again, I don't -- I don't have specifics on that. Nothing

1 that I could attest to in court.

2 **Q.** Okay. So I would like to switch gears now. We talked
3 about you being Dominion's director of product strategy and
4 security.

5 Is that a role that requires you to have a technical
6 background?

7 **A.** Yes.

8 **Q.** And does it require you to have familiarity with the
9 functionality of the devices that Dominion is selling now?

10 **A.** Intimately.

11 **Q.** Okay. So you are intimately familiar with the
12 functionality of the EMS software, for example?

13 **A.** Yes, I am.

14 **Q.** And with the ICX or ballot-marking device?

15 **A.** Correct.

16 **Q.** And with the central count scanners?

17 **A.** Correct.

18 **Q.** And with the precinct scanners?

19 **A.** Correct.

20 **Q.** Now, all of these devices run on top of operating systems;
21 is that right?

22 **A.** That's correct.

23 **Q.** Okay. Dominion doesn't write the underlying operating
24 system, does it?

25 **A.** No, we do not.

1 Q. Okay. You would agree, wouldn't you, that none of
2 Dominion's software could be considered secure if an attacker
3 could achieve control of the underlying operating system;
4 correct?

5 A. I'm not -- I'm not sure. Can you clarify that question?
6 It is a little vague.

7 Q. Sure. So the software tells the operating -- at its most
8 basic level, the software tells the operating system to do
9 things and the software stands between the user and the
10 operating system; correct?

11 A. Sort of. The operating system assists software in
12 operating.

13 Q. Since Dominion didn't write the operating system, the
14 operating system is separately -- it is underlying all of the
15 Dominion software on the hardware; correct?

16 A. That is how computer systems work, yes.

17 Q. And so if someone were able to compromise the operating
18 system by, for example, exploiting a vulnerability that hasn't
19 been patched, they could take over the machine on which the
20 Dominion software is running; correct?

21 A. It depends on the vulnerability.

22 Q. If they were able to do that, obviously depending upon the
23 vulnerability, that would compromise the security of any
24 software running on that compromised operating system; right?

25 A. Potentially. Again, it depends. That is a very

1 open-ended question.

2 **Q.** And you would agree that the logs that are generated by
3 Dominion software do not -- I'll talk about the EMS in
4 particular.

5 The logs generated by Dominion's EMS software do not
6 capture events that occur in the underlying operating system;
7 is that true?

8 **A.** Not necessarily. So we do have a variety of logs, and
9 some operating system level events are captured in the logs.

10 **Q.** Okay. Some operating system level events are not
11 captured; right?

12 **A.** Correct.

13 **Q.** Okay. And the logs themselves are editable; correct?

14 **A.** It depends on what you mean by editable, and it depends on
15 which logs you are talking about. So --

16 **Q.** Okay. To close out this topic, would you agree that one
17 of the goals of logic and accuracy testing of equipment is to
18 do some -- some measure of confirmation that the equipment is
19 working properly?

20 **A.** Absolutely.

21 **Q.** Okay. So now what I would like to do is pull up
22 Exhibit 8 -- PX 8. And I would ask if Clint can do it. I
23 can't pull that up. And if you could go to Page 6, please.

24 Now, Paragraph 9 is a long paragraph, Dr. Coomer. But I
25 want to point you to -- there is some language in there. I'm

1 just going to read it. It is about -- oh, it is sort of the
2 last sentence there. It begins pre-logic.

3 THE COURT: Could you give me the document number
4 again.

5 MR. McGUIRE: Certainly, Your Honor. It is 821-1.
6 And it is also Plaintiffs' Exhibit 8, which we won't move to
7 introduce because it is in the record.

8 **Q. (BY MR. McGUIRE)** Dr. Coomer, Paragraph 9 says, pre-logic
9 and accuracy testing, Pre-LAT, is performed each election on
10 every machine to verify that the target locations on
11 hand-marked ballots and the barcodes on BMD-marked ballots
12 correspond correctly to the choices represented on the ballots
13 and the digital cast vote records.

14 Did I read that right?

15 **A.** Yes, you did.

16 **Q.** Are you aware that the Georgia Secretary of State and the
17 State Election Board only required testing of one vote position
18 on each machine?

19 **A.** No, I'm not aware of that.

20 **Q.** Let's go if we could, please, Clint, to Page-- I think
21 we're already on it, Page 6.

22 So I would like to direct your attention, Dr. Coomer, to
23 Paragraph 10 at the bottom. It says, every ballot, hand-marked
24 or BMD-generated, scanned on a Democracy Suite tabulator
25 creates a digital image of the front and back of the ballot.

1 Did I read that right?

2 **A.** Yes.

3 **Q.** So does that mean that both precinct and central count
4 scanners create digital ballot images?

5 **A.** That's correct.

6 **Q.** And precinct scanners save -- they have the capacity to
7 save those ballot images; correct?

8 **A.** Both devices do, yes.

9 **Q.** Okay. And whether or not they save the ballot images is
10 governed by tabulator settings; is that right?

11 **A.** Yes. There is a setting that can determine that.

12 **Q.** So there is an option that you can turn on to save the
13 ballot images and an option that you can turn off to not save
14 ballot images?

15 **A.** There is. I can't say for certain that that -- that that
16 option is available in the Georgia version.

17 **Q.** So if you -- in a precinct scanner when ballot images are
18 set to be saved, the scanner saves those to the compact flash
19 memory card; right?

20 **A.** Correct. It actually saves them to two compact flash. So
21 we have redundant storage.

22 **Q.** Does one of those go to the tabulating location on
23 election day?

24 **A.** Generally, that is how it works. It depends on individual
25 counties how they transport that.

1 Q. Okay. And the other card remains with the scanner?

2 A. Generally, that is how it is done. But, again, that is
3 county-specific procedures.

4 Q. Okay. And is the information on those two cards a mirror
5 image of each other, or are there differences?

6 A. As far as the vote data, they are mirror images.

7 Q. Okay. What about other data?

8 A. So generally only one -- well, again, it depends on
9 county-specific procedures. But one card may -- only one card
10 may have the election definition because it only needs one copy
11 of that to define the election definition.

12 Q. And is it your testimony that neither copy of the
13 ballot -- neither -- neither compact flash card contains time
14 stamps associated with ballot images?

15 A. That's correct.

16 Q. So there is -- there is no time stamp added by Dominion
17 software when the ballot is scanned?

18 A. There is no specific time stamp. I believe at the
19 operating system level, there is a generic time stamp that is
20 associated.

21 Q. And that would --

22 A. They are the same for all data. So it is -- I believe it
23 is, you know, 12:01 A.M. of the day.

24 Q. So do you -- that last bit confused me. So are you saying
25 that the operating system does not record an accurate file

1 creation date in its metadata for the ballot images?

2 **A.** That's correct.

3 **Q.** It just records -- all ballot images are recorded in the
4 operating system as having the same file creation date?

5 **A.** Yeah. I mean, again, that is sort of the -- that is sort
6 of the limitation of the operating system. It -- by design, it
7 associates some date with everything that is created in the
8 system. And we ensure that that is a nonspecific date to
9 preserve voter privacy.

10 **Q.** Okay. Privacy is a good segue to the next topic. Are you
11 aware of concerns in Georgia that the BMD touch screens are so
12 large that they can reveal a voter's selections to anyone with
13 a line of sight to the screen?

14 **A.** I have heard that statement made.

15 **Q.** Do you disagree with it?

16 **A.** Yes.

17 **Q.** Why do you disagree with it?

18 **A.** Because that is -- it has no context. There are many
19 things that can be done to ensure that -- regardless of the
20 size of the screen that the voting session is private. It is
21 not inherent to the system.

22 **Q.** Are you aware that the State has adopted guidelines for
23 polling place setup that attempts to address this problem?

24 **A.** I have heard that statement. I am not aware -- I'm not
25 specifically familiar with any of the mitigations that they

1 propose.

2 **Q.** Do you know whether Dominion was involved in the adoption
3 of those guidelines or their formulation?

4 **A.** Not specifically. I don't know that for a fact. Again,
5 I'm not -- I'm not the main operations guy.

6 **Q.** Finally, I want to ask you about Dominion's involvement in
7 Fulton County's delivery of the equipment I referred to earlier
8 that the plaintiffs obtained in discovery in this case.

9 I believe you said you were aware -- I believe you said
10 you were aware generally that the Court -- that Dominion
11 equipment was provided to the plaintiffs by Fulton County; is
12 that right?

13 **A.** Correct.

14 **Q.** You are aware that the -- maybe you are not aware of the
15 specific date. But would it surprise you to learn that it was
16 provided on last Friday, September 4?

17 **A.** Yeah. I think the deadline was last Friday at 5:30
18 Eastern Time.

19 **Q.** Okay. Did you know that a Dominion tech named Mitch
20 configured the equipment for a test election in the morning of
21 September 4 before that equipment was given to the plaintiffs?

22 **A.** No, I'm not aware of that.

23 **Q.** Okay. Who would -- you aren't the person who would have
24 been supervising that, are you?

25 **A.** No.

1 Q. Okay. Would it surprise you to learn that the precinct
2 scanner that the plaintiffs received was not configured to save
3 ballot images?

4 A. I would be surprised if that is the case. I have no
5 reason to believe that that is fact.

6 Q. Okay. Would it surprise you to learn that the BMD screen
7 that the plaintiffs received shows -- when we were conducting
8 the test election shows no parties for the candidates, only
9 candidate names?

10 A. Yeah. That's pretty standard.

11 Q. To not show parties?

12 A. Yeah. That is a state-specific statute on whether that
13 happens. There is plenty of elections -- many, many, many test
14 elections, many real elections that do not display party
15 information on candidates. So I'm not at all surprised about
16 that.

17 Q. What would you make of there being a difference between
18 what the screen says to voters before they cast their -- before
19 they print their ballot, if there is a difference between it
20 saying cast ballot on the test equipment versus print ballot on
21 normal Georgia equipment? Would that difference mean anything
22 to you?

23 A. No, it wouldn't. There's lots of localizations on the
24 system because various jurisdictions like to tailor those voter
25 messages.

1 Q. Okay. And if ballots -- if the touch screen doesn't show
2 the parties associated with the candidate, would you expect the
3 ballots that are printed by that BMD to also not show the
4 parties?

5 A. No. It depends on how the data is defined. So, again,
6 that is all driven on state requirements for ballot
7 information.

8 So if you are trying to say that that shows that something
9 is wrong in the configuration of the system, that is not a
10 correct statement.

11 Q. Okay. So if any of the things I'm talking about are not
12 consistent with what Georgia law requires or what Georgia
13 ballots look like, you would agree with me that the test
14 configuration that the plaintiffs were given isn't a Georgia
15 configuration?

16 A. No, I wouldn't say that at all. Because when you define
17 configuration, that is how the system operates. What is
18 displayed on the screen is not a configuration. That is just
19 data.

20 Q. Understood. The configuration determines what is
21 displayed on the screen; correct?

22 A. No.

23 Q. I thought you said earlier that --

24 **(Unintelligible cross-talk)**

25 A. You are asking me how the system operates. So when you

1 lay out a screen, when you lay out any ballot, whether it is a
2 hand-marked paper ballot or a screen ballot, part of the
3 project definition is determining what fields are displayed.
4 That is not a configuration.

5 **Q. (BY MR. McGUIRE)** Okay.

6 **A.** That is not how it, quote-unquote, operates. It is still
7 going to create ballots the same way. It is still going to
8 read ballots the same way. It is simply what is displayed on
9 the screen. And that is just the data.

10 So test projects we often don't include -- you know, for
11 instance, some jurisdictions, certain offices, not only do you
12 have to show a party, you have to show a physical address.
13 That is just one example.

14 It doesn't change how the system operates when you choose
15 that candidate whether the party or the address is displayed on
16 the screen. That is just additional metadata that is displayed
17 to the voter.

18 **Q.** So your position is that the fact that it behaves
19 differently in a visual way from the way Georgia -- the way it
20 would behave in an actual Georgia election isn't an indication
21 that it is going to actually behave differently in a way that
22 matters?

23 **A.** It is not how it behaves. It is how the election
24 definition was defined. It is not behavior.

25 **Q.** Is there -- are you aware that Fulton County told the

1 plaintiffs that the equipment they were providing would have
2 all of the same settings that are used in a normal Georgia
3 election?

4 **A.** No. I have no idea of the communication between Fulton
5 and the plaintiffs' representatives.

6 **Q.** Okay. Can you think of any reason why a Dominion tech
7 would change the configuration away from a normal Georgia
8 election, if that happened?

9 **A.** I have no idea because I have no knowledge of how this
10 equipment was prepared or anything like that.

11 **Q.** Do you agree that the plaintiffs would be unable to test
12 the functioning of an election -- of election equipment under
13 election conditions if they are not given equipment that has
14 the same settings that apply to election conditions?

15 **A.** I would agree with that absolutely, yes.

16 **Q.** Okay. Just as a general question, do Dominion personnel
17 have the same level of access to Dominion EMS servers and other
18 system components in all of Georgia's counties that they have
19 in Fulton County?

20 **A.** I have -- I can't answer that at all.

21 **Q.** Okay.

22 **A.** One, I don't know of access any Dominion representative or
23 contractor had in Fulton County, nor do I know what each
24 individual has across the state.

25 **Q.** So just operationally, you're not really able to provide a

1 lot of detail on that?

2 **A.** No, not specifically. I would have to actually talk to
3 every single representative in every single county.

4 MR. McGUIRE: Okay. Your Honor, I have nothing
5 further on direct.

6 THE COURT: All right. Mr. Russo, are you reserving
7 questions for later?

8 MR. RUSSO: I mean, Your Honor, if you would like for
9 us to proceed now, I think -- you know, I'm happy to go forward
10 now --

11 THE COURT: Well, that is fine.

12 MR. RUSSO: -- on our direct, yes.

13 THE COURT: Are you -- but then you are basically
14 giving up calling him as a witness during your portion?

15 MR. RUSSO: That is fine --

16 THE COURT: That is fine.

17 MR. RUSSO: -- if that would help the Court move
18 faster.

19 THE COURT: I think it will. I think it will.

20 MR. RUSSO: I'm happy to do that.

21 THE COURT: I had a few questions that were hanging
22 from what was spoken. But I'll just hold them in reserve.

23 Maybe it will get clarified during your direct.

24 MR. RUSSO: That is fine.

25 DIRECT EXAMINATION

1 BY MR. RUSSO:

2 **Q.** Good morning, Dr. Coomer. I want to first touch on your
3 background. What is your educational background?

4 **A.** I have a bachelor of science in engineering physics from
5 Rensselaer Polytechnic Institute. And I have a master's and
6 Ph.D. in nuclear physics and plasma physics from the University
7 of California Berkeley.

8 **Q.** Earlier you testified to your current position at Dominion
9 as the director of product strategy and security.

10 What are your responsibilities in that position at
11 Dominion?

12 **A.** So I have several. But my main responsibility is the
13 design and development of new products based on both market and
14 customer requests and requirements and also, you know, future
15 useful products.

16 **Q.** And for the benefit of the Court, can you walk through
17 your background working in or with election systems?

18 **A.** Sure. I actually started in 2005 with Sequoia Voting
19 Systems. I was a database and software developer. After three
20 years, I became the vice president of engineering for Sequoia
21 Voting systems.

22 That company was acquired in 2010 by Dominion Voting
23 Systems, who I'm with currently. I was initially the vice
24 president of U.S. engineering for Dominion. And starting
25 around, I believe it was, 2014, I migrated to my current role.

1 Q. And at a high level, can you explain what types of
2 experience you have had in developing election systems?

3 A. Yes. So I have basically from every aspect. So I have
4 written direct code for various election components. I
5 designed from the ground up the entire adjudication system that
6 is used in the Dominion products right now. And I also provide
7 primary election support for several of our largest and most
8 complex customers.

9 Q. Do you recall previously testifying in this case or I
10 should say at one of the hearings?

11 A. Yes, I do.

12 Q. I recall you weren't necessarily fully cross-examined,
13 direct examined.

14 But has any of your testimony changed since that time?

15 A. It has not.

16 Q. Dr. Coomer, I would like to turn --

17 MR. RUSSO: I'm sorry. Is that a statement?

18 MR. McGUIRE: No. I'm sorry. I cleared my throat.
19 I'll mute myself.

20 Q. **(BY MR. RUSSO)** Dr. Coomer, I would like to turn to the
21 Dominion election system deployed in Georgia. Now, there are
22 various components to that system.

23 So we know what you are referring to and we are discussing
24 the Dominion system, can you please tell us what for you the
25 Dominion system consists of?

1 **A.** Yes. So at the heart of it is the primary back office
2 election management system. That is generally a server client
3 configuration. It is on an isolated network. That is where
4 all of the ballot definition and ballot programming is done.
5 That is also where all of the results are consolidated and
6 recorded from after election day.

7 And then we have the precinct equipment, voting equipment.
8 That includes the e-pollbooks, the ICX ballot-marking device,
9 and the ICP precinct tabulator scanner. And then we also have
10 the central count system, the ICC, for counting and tabulating
11 absentee and mail-in ballots.

12 **Q.** What types of certifications is Dominion required to go
13 through before deploying its election systems in any
14 jurisdiction in the United States?

15 **A.** So that is highly state-dependent. Some states require a
16 federal certification at the EAC, Election Assistance
17 Commission. Some require just an EAC compliant VSTL test
18 report, so voting system test laboratory report. Some require
19 a combination of federal and state certifications. And some
20 states require just a state certification alone, like
21 California.

22 **Q.** Are you aware of the certifications that the Dominion
23 system went through before being deployed in Georgia?

24 **A.** Yes, I am.

25 **Q.** And can you tell us what those are?

1 **A.** Yes. So, again, it is -- Georgia requires an actual EAC
2 certified system. And then there is a state certification
3 effort on top of that.

4 **Q.** Okay. And can you describe the EAC certification process
5 for the Court?

6 **A.** I can give a really brief summary. It would take most of
7 the day to describe the entire certification process.

8 **Q.** At a high level.

9 **A.** Yeah. The systems are tested to what is called the VVSG,
10 the Voluntary Voting System Guidelines. 1.1 is the current
11 draft. That covers a variety of tests, both functional and
12 accuracy tests. There are also reliability tests, temperature
13 power tests of the equipment.

14 It is a wide range of tests that cover everything from the
15 physical devices, how they behave in various temperature
16 conditions, functionally how the systems behave, and the
17 accuracy of the systems.

18 **Q.** If Dominion wanted to make changes to its system, would
19 that require recertification?

20 **A.** It depends on the level of change. So the EAC
21 certification process has what is called an ECO, engineering
22 change order, process for changes that are deemed what is
23 called de minimus. They do not require a full recertification
24 effort. Changes that are not identified as de minimis require
25 some recertification effort all the way up to a full campaign.

1 **Q.** What would be some examples of a change that would simply
2 require an ECO?

3 **A.** Generally, those are things like new versions of hardware.
4 So if we have a laptop model certified in the system and that
5 laptop model becomes end of life, we identify a new model.
6 That can be certified under the ECO process.

7 Recently, the EAC certification has also extended to what
8 is called a de minimis software change. So if a code change is
9 identified as de minimis or characterized as de minimis and
10 this is by the test lab itself, that software change could be
11 made without a full recertification effort.

12 That is for something like literally a one-line
13 configuration change in some config file that would have no
14 material impact on the system.

15 **Q.** Now, on plaintiffs' counsel's cross-examination, you
16 discussed the different Democracy Suite versions. And the
17 Democracy Suite version 5.5 versus 5.5-A was brought up.

18 What is the difference between those two versions?

19 **A.** Actually, I believe on direct we just talked about 5.5-A
20 and 5.5-A (GA).

21 **Q.** I'm sorry. Then I'll ask you: Is there a difference
22 between 5.5 and 5.5-A?

23 **A.** Yes. So 5.5 was our initial EAC certified version, and
24 then we went in with 5.5-A, which is the version that is also
25 federally certified and the one that is in Georgia.

1 There was a specific functional change on the ImageCast X
2 between those two versions.

3 **Q.** And is there any difference in the firmware between 5.5
4 and 5.5-A?

5 **A.** On the ImageCast X, yes, there is.

6 **Q.** But not on the rest of the system?

7 **A.** No.

8 **Q.** And when you said it went through the certification
9 process, was that the ECO process or was that a
10 recertification?

11 **A.** No. Between 5.5 and 5.5-A at the EAC, that was a full
12 recertification.

13 **Q.** Okay. Now, Dr. Coomer, when you previously testified in
14 this case in March of this year, you --

15 THE COURT: Let me just stop you for a second. The
16 change in the ImageCast system -- just so I'm not just having
17 this hanging -- that was in the Georgia system or in the first
18 5.5-A?

19 THE WITNESS: So between 5.5 -- which 5.5 has never
20 been part of the Georgia system.

21 THE COURT: Right.

22 THE WITNESS: We have a 5.5 system and a 5.5-A
23 system. The only difference between those two systems is a
24 code change on the ImageCast X BMD system. But 5.5-A and what
25 people are referring to as 5.5-A, parenthesis Georgia, (GA) are

1 identical.

2 THE COURT: And 5.5-A is what you had -- what you
3 tested and you had certified?

4 THE WITNESS: We actually certified -- somebody just
5 put up a --

6 THE COURT: Yeah. I just saw. It is somebody --

7 **(There was an interruption in the proceedings,**
8 **and the parties resumed with a telephone**
9 **conference, as follows:)**

10 THE COURT: [REDACTED]
11 [REDACTED]

12 COURT REPORTER: [REDACTED]

13 THE COURT: [REDACTED]
14 [REDACTED]

15 [REDACTED]

16 MR. CROSS: [REDACTED]

17 MR. BROWN: [REDACTED]

18 MR. McGUIRE: [REDACTED]

19 MS. RINGER: [REDACTED]

20 [REDACTED]

21 MR. RUSSO: [REDACTED]

22 MR. TYSON: [REDACTED]

23 MR. MILLER: [REDACTED]

24 [REDACTED]

25 THE COURT: [REDACTED]

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MR. RUSSO: [REDACTED]

THE COURT: [REDACTED]

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MR. CROSS: [REDACTED]

MR. MILLER: [REDACTED]

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MR. BROWN:

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MR. RUSSO:

MR. CROSS:

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MR. CROSS: [REDACTED]

MR. RUSSO: [REDACTED]

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THE COURT: [REDACTED]

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COURT REPORTER: [REDACTED]

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MR. BROWN: [REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

LAW CLERK COLE: [REDACTED]

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THE COURT: [REDACTED]

LAW CLERK COLE: [REDACTED]

(The telephone conference proceedings were

1 **thereby concluded at 11:30 A.M., and all**
2 **parties returned back to the Zoom conference.)**

3 MR. MILLER: Your Honor, I did want to say that I'll
4 be emailing exhibits to Ms. Cole for Mr. Harvey and Mr. Adida
5 shortly.

6 THE COURT: All right.

7 MR. MILLER: I'll mute now.

8 MS. RINGER: This is Cheryl Ringer. Can you forward
9 your exhibit for Mr. Barron?

10 MR. BROWN: I will.

11 **(There was a brief pause in the proceedings.)**

12 THE COURT: All right. So Mr. Brown, Mr. Cross,
13 Mr. Russo, do you have everyone in your team -- I mean, you are
14 the people I can see right now. I also can see Mr. McGuire,
15 but I'm trying to not be repetitive.

16 Everyone in your respective team who needs to be here
17 is present?

18 MR. BROWN: Yes, Your Honor.

19 THE COURT: All right. Are we ready?

20 MR. RUSSO: We have Dr. Coomer and me. And so I
21 think we are good for now.

22 THE COURT: Very good. Ms. Cole, are you ready to
23 begin?

24 LAW CLERK COLE: Yes.

25 Is there any attorney who has not been unmuted that

1 needs to be unmuted? For example, Ms. Ringer, for Fulton
2 County, right now she is muted. I don't know if she needs to
3 be unmuted or not.

4 MS. RINGER: Ms. Cole, I'm fine. Thank you.

5 THE COURT: I think that what we have to manually now
6 do the -- remember the muting and not muting. So if it ends up
7 a problem, you will have to text one of your colleagues who is
8 unmuted to raise the issue.

9 All right. Ladies and gentlemen in the remote
10 audience, obviously we had a significant problem with somebody
11 either zooming in and sharing the destructive memes or else
12 somebody present intentionally or inadvertently shared a video
13 with the rest of the people present.

14 So we are now sort of at a more controlled level.
15 Things may be a little more awkward because now Ms. Cole on
16 behalf of the Court is going to have to show each of the
17 exhibits rather than having counsel do it.

18 And we're ready to begin, and we will not be taking a
19 lunch break. We will just simply proceed and take smaller
20 breaks along the way.

21 All right. I think that counsel for the State was
22 examining Mr. Coomer, if I remember. But at this point, I'm
23 not 100 percent sure. I think that is correct.

24 Go ahead.

25 MR. RUSSO: I think that is right, Your Honor. I

1 believe we were discussing and you were having some dialogue
2 with Dr. Coomer about the version 5.5-A with the Georgia
3 notation behind it, and that is the testimony now. The record
4 is clear already.

5 Did you have additional questions on that?

6 THE COURT: No. I had something. I'll get back to
7 it. That's fine.

8 MR. RUSSO: Thank you.

9 **Q. (BY MR. RUSSO)** Dr. Coomer, welcome back. When you
10 previously testified in this case in March of this year, you
11 discussed transition from Georgia's old DRE GEMS system to the
12 new Dominion system.

13 Do you recall that?

14 **A.** Yes, I do.

15 **Q.** And you testified at that time that there is no source
16 code or software from the GEMS system that is carried over into
17 the new Dominion system.

18 Do you recall that?

19 **A.** I do recall that, and that is correct.

20 **Q.** Okay. And has your testimony on that changed?

21 **A.** Not at all.

22 **Q.** Okay. Is Dominion's system in Georgia a ground-up
23 isolated system?

24 **A.** Yes, it is.

25 **Q.** And can you describe or explain to the Court what it means

1 for Dominion's system to be a full end-to-end system?

2 **A.** Yes. So the Democracy Suite system is a full end-to-end
3 election management system. So it defines the geopolitical
4 data, precincts, districts, the election specific data contest
5 candidates, ballot styles. It manages all of the voting
6 terminals and tabulators, and it also consolidates and reports
7 all of the results as well.

8 **Q.** And by being a ground-up isolated system, never kind of
9 mixing two different issues here, the full end-to-end system
10 from the ground up -- can you explain what a ground-up isolated
11 system is?

12 **A.** Yeah. I mean, the Dominion Suite product is a wholly
13 developed Dominion system. It does not use any legacy
14 components from past voting systems. And it is a
15 self-contained, self-functioning election management system and
16 tallying tabulation system.

17 **Q.** We have heard about the hardening of the EMS. Is the EMS
18 hardened to any benchmarks?

19 **A.** Yeah. So we harden the servers and the work stations to
20 the NIST benchmarks for the operating system that is installed
21 on those servers and work stations.

22 **Q.** And can you tell us about the NIST benchmark standard?

23 **A.** Yeah. I mean, so NIST puts out essentially guidelines
24 on -- benchmark guidelines on hardening scripts and what
25 aspects of operating systems should be configured and how they

1 should be configured to be considered hardened. And we apply
2 all of those through our hardening scripts.

3 **Q.** And do you know whether the NIST benchmark hardening
4 requires removal of all applications that are not necessary for
5 the functioning of the EMS?

6 **A.** That is not specifically spelled out in those benchmarks,
7 no.

8 **Q.** And in your opinion, is the NIST benchmark considered the
9 gold standard?

10 **A.** I would think it is, yes.

11 **Q.** And, Dr. Coomer, I would like to turn to Dominion's
12 ballot-marking devices specifically. And we all, I think, are
13 familiar with what the ballot-marking device can do.

14 But if you could, just give us a high level overview of
15 the BMDs.

16 **A.** Yes. So it provides a touch screen interface to the voter
17 as well as an audio tactile interface for voters with
18 disabilities. It provides both visual and in the case of a
19 disabled voter audio instructions to navigate through the
20 ballot and allow the voter to make selections for choices on
21 the ballot.

22 And then it provides consolidated review of all of those
23 choices and then an option to print the QR coded summary
24 ballot. It also provides -- you know, once you look at that
25 review, you can go back and modify your choices at any time.

1 And then at the end of the day, you get out a printed
2 ballot record that the voter then takes into and feeds into the
3 ImageCast precinct tabulator.

4 **Q.** All right. And we discussed -- opposing counsel discussed
5 undervotes earlier.

6 Can you tell us does the BMD identify undervotes to the
7 voter before printing of the ballot?

8 **A.** Yes, it does. So -- so a couple of things there. So a
9 lot of feedback is given to the voter on both the wall voting
10 within the ballot selections and on the review screen. So
11 obviously since it is a touch screen interface that we have
12 full control over, we actually don't allow the voter to make
13 overvote selections. Anything that is undervoted is clearly
14 indicated to the voter before printing the ballot. So it
15 really addresses a lot of the voter intent issues that you have
16 with hand-marked ballots.

17 **Q.** Okay. And I apologize. But if my screen is breaking up,
18 please let me know because I had a message saying my connection
19 was slow.

20 **A.** You are a little blurry.

21 **Q.** Okay. Can you hear me just fine?

22 **A.** Yes.

23 MR. RUSSO: And, Judge Totenberg, can you hear me?

24 THE COURT: Perfectly.

25 MR. RUSSO: Okay. Then I'll just continue forward.

1 You don't necessarily need to see my face.

2 **Q. (BY MR. RUSSO)** Now -- the printout of the ballot, does
3 that indicate whether the voter has -- well, in the instance of
4 an undervote, does the printout provide any indication of that?

5 **A.** Yes, it does. So very similar to the review screen, the
6 printed ballot -- it lists all of the contests and the choices
7 made. And if there was not a selection made, whether it is for
8 a single vote or a multi vote, it clearly communicates that
9 information to the voter on the printed record.

10 **Q.** Okay. And we've discussed --

11 THE COURT: I'm sorry. Does it say blank, or what
12 does it say?

13 THE WITNESS: I believe it says no selection made.

14 THE COURT: Go ahead.

15 MR. RUSSO: Yes, ma'am.

16 **Q. (BY MR. RUSSO)** And in your experience, Dr. Coomer, do
17 BMDs have the type of voter intent issues that hand-marked
18 paper ballots do?

19 **A.** No, they don't. As I mentioned, the system itself
20 prevents things like overvotes, which is a very common voter
21 intent issue. The selections are determinative. There is no
22 counting of pixel density within the target range. The
23 selections are explicit.

24 **Q.** Has Dominion received any complaints about the BMDs such
25 as those that are deployed in Georgia selecting the wrong

1 candidates when voters touch the screen?

2 **A.** No. And if I can expand on that, I mean, that was a
3 common complaint of legacy touch screen systems. Those legacy
4 systems used a different touch screen technology that was very
5 susceptible to calibration issues. We do not experience those
6 on the modern equipment. So that has not been an issue in the
7 field.

8 **Q.** And can you expand on that for us about the -- how does
9 the BMD -- Dominion's BMD touch screen work compared to the
10 calibration-type touch screens in the legacy systems?

11 **A.** Yes. So the monitoring touch screens are what is called a
12 capacitive touch screen. It is the same technology that is on
13 your smart phones. Legacy systems were resistant touch
14 screens. They were very susceptible to environmental
15 conditions, use, and experienced what is called drift in the
16 calibration of the screens.

17 **Q.** How many jurisdictions that you know use the Dominion
18 BMDs?

19 **A.** Yeah. Again, I don't have any exact numbers. I think
20 currently we are in -- with the ICX BMD, we are in somewhere
21 between five and seven states. And, you know, if you are
22 counting jurisdictions that is county-based -- I mean,
23 obviously in Georgia we're in 159 counties. In Colorado, I
24 believe we are in 62 of the 64 counties with the ICX BMD.
25 We're in, I think it is, 40 or 42 counties in California,

1 Michigan, Ohio, Tennessee, New Jersey, Pennsylvania.

2 THE COURT: I'm sorry. When you are listing these
3 states, are you saying statewide or you have some jurisdictions
4 you are servicing?

5 THE WITNESS: No. Some jurisdictions. Statewide --
6 statewide -- again, I think statewide -- specifically
7 statewide, Georgia only. But, again, like in Colorado it is 62
8 of the 64 counties. California, it is 40 to 42 of 60-plus
9 counties. So it runs -- it runs a range.

10 **Q. (BY MR. RUSSO)** And earlier there were some questions
11 about the QR code on the printed ballot. Can you explain for
12 us the various features of the QR code?

13 **A.** Yeah. So as discussed in some prior testimony, we encode
14 quite a bit of information on the QR code. There are some
15 election specific data that is encoded on there. There is
16 essentially what is referred to as a bitmask of all of the
17 choices available on the ballot and those that are,
18 quote-unquote, marked through the BMD system.

19 And then there is a hash -- SHA-256 hash of that record
20 also encoded in the barcode that is used to verify both the
21 source and integrity of the data. And that is in the barcode.

22 And then on the ballot itself, as we discussed, there is
23 the human readable summary of all of the selections made and an
24 indication of any selection that was not made, quote-unquote,
25 an undervote.

1 **Q.** Mr. Liu discussed or mentioned that encryption is an
2 industry term of art. Is the QR code encrypted based on the
3 industry term -- that industry term of art?

4 **A.** No. We do not encrypt the barcode. We do digitally sign
5 the bar -- the data that is in the barcode. And then the
6 barcode itself is in a binary format.

7 **Q.** Is the QR code intended to be encrypted?

8 **A.** No, it is not.

9 **Q.** How would the -- either one of the scanners, the ICC or
10 the ICP scanner, know that a QR code has not been tampered
11 with?

12 **A.** We do a verification of the digital signature of the
13 record. And that is using the secure keys that are part of the
14 system and the standard SHA-256 hashing algorithm.

15 **Q.** And what are -- can you explain what the SHA-256 checksum
16 is?

17 **A.** I can give you a summary of that. I mean, it is
18 essentially an algorithm that is applied using a cryptographic
19 key that gives a unique signature of the data within the
20 record.

21 **Q.** And is that what the digital signatures verify?

22 **A.** Yes, it is.

23 **Q.** What would be needed for someone to access all of the
24 software coding and encryption key material to generate a valid
25 QR code that would be accepted by an ICP scanner?

1 **A.** Well, I mean, that is kind of an open-ended question. But
2 essentially they would have to breach all levels of the system.
3 They would have to get access to the source code to understand
4 how data is exchanged. They would have to defeat all of the
5 various, you know, physical security mechanisms.

6 And then they would have to essentially reverse engineer
7 the entire system to, you know, build and exploit a valid
8 threat factor in order to compromise the system.

9 **Q.** I'll turn to the ICP scanners and tabulation of
10 hand-marked paper ballots.

11 What does the ICP read when a hand-marked paper ballot is
12 placed into the scanner?

13 **A.** Regardless of whether it is hand-marked or the QR ballot,
14 the scanners first take a digital image of both sides of the
15 ballot. In the case of hand-marked paper ballots, it looks for
16 various artifacts that are included on the printed ballot.
17 These are referred to as things like long corner marks and the
18 timing marks. You can see those in any of the ballot
19 representations that have been presented.

20 That is used to essentially orient the image so that then
21 we can apply our image processing algorithms. We use those
22 corner marks to orient the image. We use the timing marks,
23 essentially set up a grid to define where the specified voting
24 target locations are. And then our image recognition analyzes
25 those target areas and looks for -- essentially calculates the

1 percentage fill of those areas to determine whether it is a
2 mark or not -- a selected choice or not.

3 **Q.** In Georgia, the hand-marked paper ballots have a black
4 oval. Does that contribute to the calculation of the ballot
5 fill?

6 **A.** It absolutely does. So -- and, again, I don't want to
7 make any definitive statements on whether one is better than
8 the other as far as, you know, target color.

9 But one -- one of the issues to consider when having a
10 black target in the scanning system is that by definition the
11 scanner can -- will pick up that target and it does contribute
12 to some of the, quote-unquote, signal of the pixel fill of the
13 target area.

14 **Q.** So if the scanner setting -- scanner threshold settings
15 were set too low or turned off entirely, how would that impact
16 the ballot targets in the scanning process?

17 **A.** Yes. So let me be a little more specific. So a target --
18 a black target in any scanning system is going to register some
19 percent of fill of the target area. That is dependent not just
20 on the color of the target but on the thickness of the target
21 and that is dependent on the print quality. That is one of
22 those things going back to -- you know, we discussed some of
23 the things about qualified printers, et cetera. Those are a
24 lot of the things that we analyze. Because, you know, when we
25 go through a printer, we want to try to ensure that targets

1 are, you know, well defined but also as thin as possible.

2 And in a well represented ballot, that target area of the
3 black target will contribute anywhere from three to
4 seven percent target fill. So if you would set a lower
5 threshold -- let's say you set it to five percent -- every
6 target on the ballot would register as an ambiguous mark or
7 potentially as an ambiguous mark because just the presence of
8 that black oval could be above five percent.

9 So that is one of the -- that is one of the variables that
10 we have to consider when we define these threshold values.

11 **Q.** You mentioned Colorado earlier as one of the jurisdictions
12 or states that has a number of Dominion ballot-marking devices
13 and scanner systems in place.

14 Were you at Dominion when Colorado switched to that setup?

15 **A.** Yeah. I actually -- I was part of the design team for the
16 ICX BMD, which was actually developed in partnership with
17 Denver County in Colorado. So yes, I was there from the first
18 meeting until the final implementation.

19 **Q.** And are you familiar with the -- whether Colorado on
20 hand-marked paper ballots has a black oval or a red oval?

21 **A.** The majority of counties in Colorado use a red oval. And
22 they do configure the scanners to use what is called a red
23 dropout.

24 So in that configuration, the scanner cannot even see a
25 red color. So it does not -- the presence of a red target does

1 not add any percentage fill to the target area. So, again,
2 that is one technique for increasing the sensitivity of the
3 entire system when scanning ballots.

4 **Q.** So if a -- so if I understand, if Colorado is at a
5 five percent target fill with a red oval and Georgia is at a
6 ten percent target fill with a black oval -- you said that
7 black oval is three to seven percent -- Georgia's target fill
8 is actually less, I would say?

9 **A.** Yeah. I mean, it is about -- so, again, it is about
10 equivalent of the sensitivity. It is a little more nuance than
11 that.

12 But, again, if you are using black ovals, you have to
13 raise the lower threshold to compensate for the -- for the
14 effect of having a black oval that leads to, you know,
15 registering pixel fill in a target area.

16 **Q.** When the scanners -- when Dominion's scanners were
17 certified, do you know if they were certified to any particular
18 threshold settings for the ICP?

19 **A.** Yeah. So we have default settings as part of the system.
20 Those are based on our, you know, decades now of empirical
21 field evidence and image analysis of the system.

22 So when we go into certification, we use those default
23 values. That is how the system is delivered. But, again,
24 early enough in a specific project, end users, states, they can
25 modify those thresholds, again with all the caveats of, you

1 know, target color and whether you are using red dropout or
2 not.

3 **Q.** Georgia could not just switch over to a red dropout is
4 what you are saying?

5 **A.** Oh, no. They could configure the system to use a red
6 dropout and red ovals. That is all part of the configuration
7 of the system.

8 I'm just saying that when you make those configuration
9 changes we use different default values of the thresholds to
10 compensate for those different configurations.

11 **Q.** And presumably you would need different types of ballots
12 printed?

13 **A.** Correct.

14 **Q.** Now, we heard about the AuditMark earlier. What
15 information is included in the AuditMark from the ICC?

16 **A.** So from the ICC, we included a couple of pieces of what
17 I'll call metadata. You know, we have a date stamp on the ICC
18 because there's not the issue of voter privacy in the central
19 count situation. You know, we have information about what
20 scanner it came from. All the scanners get a serial number
21 essentially in the system.

22 We have precinct information, ballot style information.
23 And then the bulk of the AuditMark -- the meaningful
24 information on the AuditMark is a contest-by-contest listing of
25 all of the choices that register as a valid vote.

1 And then --

2 **Q.** Go ahead. I'm sorry.

3 **A.** And then just because I know the question is coming,
4 anything that is not registered as a vote would be marked as an
5 undervote for a particular contest or a blank vote.

6 **Q.** Does the AuditMark include information about ambiguous
7 marks from the ICC?

8 **A.** The AuditMark does not, no.

9 **Q.** What does happen when an ambiguous mark is determined?

10 **A.** So, you know, the AuditMark and the images of the ballot
11 is just one piece of digital information that we capture when
12 scanning a ballot. So, you know, once the AuditMark and the
13 images are captured and the image is analyzed, we create what
14 is called a cast vote record.

15 And, again, that has a lot of election specific data. It
16 has some correlation to the image that is saved. And then it
17 has additional metadata around things like ambiguous marks. It
18 includes things like what the actual percentage fill of each
19 mark that is detected. All of that is included in that cast
20 vote record.

21 So, you know, an image is correlated to a cast vote
22 record. We use all of that information, you know, when doing
23 something like sending a ballot to adjudication.

24 **Q.** Would the cast vote record be reflected on the AuditMark?

25 **A.** No, it is not part of the AuditMark. But it is correlated

1 to the image that includes the AuditMark.

2 **Q.** Can you explain what is the importance then of the cast
3 vote record?

4 **A.** So the cast vote record is actually the digital data that
5 is used for generating the reports. Right? So, you know, we
6 capture the image as part of the auditability and transparency
7 of the system.

8 The AuditMark is, again, a contemporaneous record of how
9 the tabulator interpreted, you know, ballot marks at the time
10 of scanning. And the cast vote record is the actual bytes that
11 are used to tabulate ballots and report on ballots in the
12 system and also to support things like our digital adjudication
13 along with the image.

14 THE COURT: I'm sorry. You need to go over that
15 again. You got the AuditMark versus the cast vote record.

16 Which one were you just describing?

17 THE WITNESS: Well, I was describing both. So the
18 image of the ballot, we append the AuditMark. It is part of
19 the image that is taken by the scanner. The cast vote record
20 is the actual digital record of the vote data that corresponds
21 to that image and AuditMark.

22 THE COURT: So which one has the -- we were talking
23 about ambiguous. Is that -- we know that is not appearing on
24 the AuditMark.

25 THE WITNESS: All of that data is included in the

1 cast vote record.

2 THE COURT: Does the image also reflect when there is
3 no selection at least as recorded by your system?

4 THE WITNESS: Yes, it does. The AuditMark does, yes.

5 THE COURT: The AuditMark does?

6 THE WITNESS: Yes.

7 THE COURT: So the AuditMark says what has been
8 passed, but it doesn't say -- but it doesn't identify by itself
9 ambiguity that you have got ten -- let's say you have got ten
10 checks for office which were ambiguous.

11 THE WITNESS: That's correct.

12 (Unintelligible cross-talk)

13 Q. (BY MR. RUSSO) Dr. Coomer, just for clarification, does
14 the AuditMark include the metadata?

15 A. It includes some metadata. Like I said, it includes
16 things like what, you know, physical ICC it was scanned on,
17 what batch it is part of, the sequence number within the batch.
18 So there is some metadata, but it does not include the metadata
19 allowing ambiguous marks and things like that.

20 Q. Yesterday plaintiffs showed some ballot images containing
21 missing ovals on the ballot.

22 Did you see those?

23 A. Missing ovals? I think I did. I think I recall seeing
24 something like that. And, again, I mean, when you say missing
25 ovals, you mean on the image you could not see the artifact of

1 an oval?

2 **Q.** That's correct.

3 **A.** Okay.

4 **Q.** Do you know why a ballot would -- a ballot image would
5 show -- would have all the ovals missing?

6 **A.** Yeah. That is -- that happens when you have a red oval
7 and you are using red dropout on the scanner.

8 THE COURT: But I thought you only used black in
9 Georgia.

10 THE WITNESS: As far as I know, we only use black. I
11 can't say that, you know, with a 100 percent. I know that
12 predominantly black ovals are used in Georgia.

13 But, again, if we're talking about a scanned image, I
14 know that one was showed that didn't have ovals. The only way
15 that I'm aware of that that could happen is because the ovals
16 were printed in red and red dropout was used.

17 So I can't say what the origin of that image was.
18 And it may not necessarily be from an official Georgia project.

19 **Q. (BY MR. RUSSO)** If the image was viewed outside of
20 Dominion's hardware, would that cause -- possibly cause any
21 changes or if it was a PDF?

22 **A.** I mean, if the image was manipulated, it would. But, you
23 know, we capture these images in a standard TIFF format kind of
24 like a JPEG. It is just a different coding algorithm. There
25 is nothing in the system that would go in after scanning and,

1 quote-unquote, remove image data.

2 If there is not an oval target, it is either because it
3 was a red dropout red oval ballot that was scanned or the image
4 was manipulated after scan time.

5 **Q.** And counsel for the plaintiffs asked you about
6 different -- about availability of paper ballots -- hand-marked
7 paper ballots and mentioned photocopying of a valid ballot.

8 And you stated in response that you could not agree that a
9 scanner would count a photocopy of a paper -- hand-marked paper
10 ballot.

11 What did you mean there? Why would you say that?

12 **A.** Well, I said that potentially it could -- it could count.
13 But there is no guarantee that it would -- would count the same
14 as an officially printed ballot from a qualified printer.

15 MR. RUSSO: And I don't think I have any more
16 questions at this time, Your Honor.

17 THE COURT: All right. Are there any other -- any
18 cross-examination follow-ups?

19 MR. RUSSO: Mr. McGuire appears to be holding his
20 hand up.

21 THE COURT: All right, Mr. McGuire. Thank you.

22 COURT REPORTER: He is muted.

23 THE WITNESS: I think you can unmute yourself once --

24 THE COURT: I don't think he can.

25 MR. MCGUIRE: I have been invited to unmute, and I

1 have.

2 **(There was a brief pause in the proceedings.)**

3 RE-CROSS-EXAMINATION

4 BY MR. MCGUIRE:

5 **Q.** Okay. Dr. Coomer, just a couple of points on, I guess,
6 redirect, recross.

7 First of all, you mentioned that the BMDs are used in a
8 number of other jurisdictions; right?

9 **A.** Correct.

10 **Q.** Now, 62 of the 64 counties in Colorado that used BMDs only
11 used them for accessibility purposes; isn't that right?

12 **A.** No, that's not correct at all.

13 **Q.** How many of them use it for all voters?

14 **A.** It depends. And I am a Colorado resident. So I actually
15 know the statute.

16 They use the ICX BMDs in the voting service polling
17 centers, the SPCs. Any voter that comes to the SPC can request
18 to vote on the ICX BMD or they can request to get a hand-marked
19 paper ballot. It is up to the voter. And it is not restricted
20 to disabled voters.

21 And I vote on the ICX BMD in Colorado, and I'm not
22 considered somebody with a disability.

23 **Q.** So you are saying it is available to all voters, but it is
24 not the required -- it is not the default voting mechanism for
25 all voters?

1 **A.** Many -- many of the SPCs, many of the counties do try
2 to -- I want to be careful on how I qualify this. They do make
3 that the predominant voting channel for people that vote in
4 person, yes.

5 **Q.** Okay. How many of the jurisdictions that you listed as
6 using BMDs actually use them for all voters?

7 **A.** I don't think anybody uses them for all voters because you
8 always have absentee and mail-in voters for some voting
9 population.

10 **Q.** Right. Let's say for all in-person voters.

11 **A.** Again, I couldn't give you a definitive answer on that. I
12 know that, again, some it is a predominance and some it is not.

13 **Q.** And did I understand you correctly to testify that the BMD
14 QR code is encrypted or is not encrypted?

15 **A.** It is not.

16 **Q.** It is not encrypted.

17 Okay. Are you aware that Mr. Cobb from Pro V&V has
18 submitted a declaration in this case which quotes Dominion
19 documentation saying that QR codes -- encoded data is encrypted
20 and signed in order to prevent tampering of user selection and
21 eliminate the possibility of error?

22 **A.** I have not read Mr. Cobb's declaration. I have seen a
23 couple of exhibits put up today. And I am also aware that he
24 amended his declaration to amend that statement.

25 I'm not sure where the miscommunication came from. But as

1 far as I know, he has amended that declaration and he is no
2 longer stating that Dominion documentation states that it is
3 encrypted. We wouldn't state that in documentation because it
4 is not encrypted, never has been, never planned for.

5 **Q.** Okay. So it is your testimony that the quotation from
6 Dominion documentation to that effect is -- was wrong?

7 **MR. RUSSO:** Your Honor, I was trying to impose an
8 objection on the line of questioning regarding the Pro V&V
9 analysis that Mr. McGuire is discussing because it is outside
10 the scope of direct.

11 **THE COURT:** Well, they are talking about encryption.
12 I think he is just trying to verify that it has never -- the
13 word encryption -- the representation of encryption has not
14 been in the Dominion documentation.

15 Is that your representation?

16 **THE WITNESS:** As far as I know. I haven't -- I
17 haven't seen any documentation from us that states the barcode
18 is encrypted.

19 **Q. (BY MR. McGUIRE)** You testified that the cast vote record
20 is correlated to the edges in the scanners.

21 **A.** Yes.

22 **Q.** How are they correlated? What is the correlating -- what
23 is correlating them?

24 **A.** There is a cast vote record ID that is included. It is
25 actually the -- it is the name of the image file. It is the

1 cast vote record ID of the cast vote record that is stored in
2 the system.

3 THE COURT: I'm sorry. Ms. Welch, what did you want?

4 COURT REPORTER: I got it.

5 THE COURT: The cast vote record is --

6 THE WITNESS: There is a cast vote record ID that is
7 assigned to the cast vote record. And that is the image name.
8 And it is included -- it is not just the name of the image
9 file. But it is also included in the image itself as part of
10 the AuditMark.

11 **Q. (BY MR. McGUIRE)** And so -- it is your testimony that the
12 image in the AuditMark includes some metadata but not all of
13 the metadata that is in the cast vote record?

14 **A.** Correct.

15 **Q.** Okay. And nothing in the cast vote record contains any
16 kind of date or time of creation of the file?

17 **A.** I didn't say that. So it depends on -- it depends on the
18 source of the image. So for a centrally counted ballot, we do
19 include date/time stamp information because there is not the
20 concern of voter privacy. And that helps with things like
21 auditing and correlation.

22 THE COURT: I'm sorry. For which type of ballot?

23 THE WITNESS: That is for the centrally counted
24 ballot.

25 THE COURT: All right.

1 **A.** So the ICC. So the AuditMark between the ICC and the ICP
2 are different.

3 **Q.** **(BY MR. McGUIRE)** The cast vote record, it sounds like,
4 they are different as well?

5 **A.** Correct.

6 **Q.** Dr. Coomer, you testified in response to Mr. Russo that
7 the Dominion system actually was -- there actually was a
8 certification change, that the 5.5-A Georgia system actually
9 was different from the 5.5-A?

10 **A.** No.

11 **Q.** Is that correct?

12 **A.** No. I have had to repeat that multiple times. There is
13 absolutely no difference between the 5.5-A and what is labeled
14 as 5.5-A (GA). There is a difference between the 5.5 and the
15 5.5-A.

16 **Q.** Okay. So I would like to show an exhibit, PX 54. Now,
17 this is the -- I'm going to represent to you this is the Pro
18 V&V report. And --

19 MR. RUSSO: Again, Your Honor, I would object to this
20 being outside the scope of direct as I did not ask him about
21 the Pro V&V report.

22 MR. McGUIRE: Your Honor, my position is that this
23 would be rebuttal of the testimony he gave when Mr. Russo
24 questioned him.

25 THE COURT: All right. I'll let you go for a little

1 while. And if it is not directly responsive --

2 MR. McGUIRE: It will be quite short.

3 And I know Ms. Cole is doing this and not the tech
4 people, so I'll ask Ms. Cole if you can turn that document to
5 Page 3 of the PDF.

6 **Q. (BY MR. McGUIRE)** And it is -- I'm going to direct your
7 attention, Mr. -- Dr. Coomer, to the bottom of Page 3 where --
8 it might be small there. I'm going to read to you -- there is
9 a Section 1.3 called description of modification.

10 And the last two sentences read, Dominion's ECO, which I
11 believe is engineering change order, and there is a number --
12 introduces the DR G2140 scanner to support the D Suite 5.5-A
13 (GA) system configuration.

14 Do you see that? Did I read it correctly?

15 **A.** Yes.

16 **Q.** And it says, due to the previously approved Canon DR G1130
17 going end of life, the Canon DR G2140 scanner is the
18 manufacturer's recommended replacement.

19 Did I read that right?

20 **A.** Yes, you did.

21 **Q.** Okay. Then in the next Section 1.4, it refers to the
22 scope of testing required for the submitted modification.

23 Do you see that?

24 **A.** I mean, I see a 1.4. I could probably read everything
25 that is in there.

1 I will cut to the chase. I know where you are going with
2 this. So --

3 **Q.** Well, maybe you do. I mean, I'm going -- I'm going to go
4 back to Page -- go to the next page, Page 4. And I'll direct
5 you to Section 2.0, testing overview.

6 It says there, the first sentence, the evaluation of D
7 Suite 5.5-A (GA) was designed to verify that certain features
8 and applications which have been modified from the certified
9 baseline system conform to the applicable EAC VVSG 1
10 requirements.

11 **A.** Yeah.

12 **Q.** How is that consistent with your testimony that there is
13 no change to the system from 5.5-A?

14 **A.** Because we applied this same ECO to the baseline 5.5-A EAC
15 certification. So if you go to the current EAC website and go
16 under and pull up our 5.5-A certification, you will see the ECO
17 with a 2140 DRG Canon scanner.

18 **Q.** And that is pulled up under 5.5-A, not under 5.5-A (GA)?

19 **A.** That's correct.

20 **Q.** So this is not a change you made specifically for Georgia?
21 It is for all of your 5.5-A systems?

22 **A.** That's correct. And, again, that is an ECO for hardware.
23 And I have been very explicit that there were no firmware or
24 software differences between those.

25 MR. RUSSO: Again, Your Honor, I just want to renew

1 my objection to this report coming in under Dr. Coomer. It is
2 outside the scope of his direct. And Mr. McGuire is obviously
3 trying to contest the accuracy of that report through
4 Dr. Coomer. And, of course, we'll have Mr. Cobb up from Pro
5 V&V later.

6 THE COURT: Well, I disagree because he strongly
7 represented that there had been no changes. And so I think he
8 is entitled to explore that and see whether it was true or not
9 true.

10 MR. RUSSO: Right. And that is fine.

11 THE COURT: All right. Anyway, your objection is
12 overruled.

13 All right. Let's proceed.

14 **Q. (BY MR. McGUIRE)** Mr. Coomer, in your declaration from
15 November --

16 **A.** I'm sorry. It is doctor.

17 **Q.** I apologize. I apologize. It is a habit.

18 **A.** You never make that mistake with your witnesses.

19 **Q.** Yes. I apologize. It is not intentional.

20 Dr. Coomer, in your declaration, 821-1 in November of
21 2019, you wrote that any changes to the source code of any
22 components of Democracy Suite would require new certification
23 by the U.S. Election Assistance Commission and the State of
24 Georgia.

25 Do you still -- do you stand by that statement?

1 **A.** That has changed slightly because at the time that that
2 declaration was made I don't believe that there was complete
3 guidance from the ECO on de minimis software changes. That has
4 been clarified, and it might have actually been sort of
5 contemporaneous to that.

6 So there is a mechanism at the EAC currently to support de
7 minimis software changes that do not trigger a full
8 recertification effort.

9 **Q.** And changing a printer is a de minimis change?

10 **A.** Yes, it is. Well, in our case, it was deemed de minimis.
11 I could certainly envision a printer change that required, you
12 know, new drivers, new software that would not be de minimis.

13 **Q.** And when you told Mr. Russo that the change to the Georgia
14 version was the BMD touch screen, how does that fit into this
15 change to the printer?

16 **A.** As I explained, the change to the ICX software was between
17 5.5 and 5.5-A.

18 **Q.** And I apologize. I want to correct myself. I said how
19 does it compare to this change to the printer. I meant this
20 change to the scanner. I apologize.

21 **A.** It is completely different. The change between 5.5 and
22 5.5-A on the ICX was actually source code change that was not
23 deemed de minimis.

24 **Q.** And that -- was that the BMD change that went from 5.5 to
25 5.5-A?

1 **A.** That's correct.

2 **Q.** So has there been any other changes apart from this
3 scanner change between 5.5-A and 5.5-A (GA)?

4 **A.** No.

5 **Q.** Okay. And I believe you mentioned a VVSG 1.1 standard to
6 Mr. Russo. Just to be clear, the 5.5-A (GA) system is
7 certified with a VVSG 1 standard; correct?

8 **A.** I mean -- well, I would have to look at the report.
9 Because, again, just different testing campaigns are either
10 under 1.0 or 1.1. So I can't say.

11 **Q.** Would you disagree with Pro V&V if they said in their
12 report that it was certified with a 1.0 standard?

13 **A.** No, I wouldn't disagree.

14 **Q.** And you agree that the VVSG 1.0 standard is about ten
15 years older than the VVSG 1.1 standard?

16 **A.** Yes. But I can also say that just because it was tested
17 to 1.0 does not mean that it doesn't use the 1.1 standards.

18 MR. McGUIRE: Okay. Your Honor, I have no further
19 questions.

20 MR. CROSS: Your Honor, this is David Cross. Two
21 quick questions if I may just picking up on Mr. Russo's.

22 THE COURT: All right.

23 CROSS-EXAMINATION

24 BY MR. CROSS:

25 **Q.** I just want to make sure I understand your position,

1 Dr. Coomer.

2 Did I understand correctly that you have never seen any
3 representation by Dominion that the QR codes are encrypted?

4 **A.** I haven't seen any representation, no.

5 MR. CROSS: Ms. Cole, can you just quickly pull up
6 the document I just sent you? Just the cover page. Only the
7 cover page. It is PX 56.

8 **Q. (BY MR. CROSS)** And while she does that, Dr. Coomer, I can
9 just ask you if it helps.

10 Have you ever seen a document entitled from Dominion 2.02
11 Democracy Suite system overview? Does that sound familiar?

12 **A.** I mean, it sounds familiar. But that is our standard
13 naming convention for documentation. I can't say whether I
14 have actually read every page of that specific document.

15 LAW CLERK COLE: Mr. Cross, can you hear me?

16 MR. CROSS: Yes.

17 LAW CLERK COLE: There was no attachment to your last
18 email that says PX 56.

19 MR. CROSS: Sorry. Yes. Sorry. It is the one that
20 I emailed you that you responded to. It is the same document.

21 LAW CLERK COLE: Okay.

22 MR. CROSS: I'm sorry. It has got like a bright red
23 cover page.

24 **Q. (BY MR. CROSS)** Again, Dr. Coomer, while she's pulling
25 that up, did you review Mr. Cobb's declarations?

1 **A.** No, I did not.

2 **Q.** So have you seen this document before from Dominion that
3 was produced to us by the State?

4 **A.** Again, I can say that I have seen many documents that look
5 a lot like this. I can't say definitively if I have seen this
6 exact same document. And I certainly say I have probably not
7 read every page in it.

8 **Q.** Well --

9 MR. RUSSO: Just real quick, Your Honor -- sorry,
10 David -- I noted that it has got attorneys' eyes only on the
11 bottom. Is this one of the documents we had resolved
12 previously, or is this still deemed attorneys' eyes only?

13 MR. CROSS: I'm not sure. But I'm not going to put
14 the substance up. I literally just have one more question on
15 this.

16 MR. RUSSO: Okay.

17 **Q. (BY MR. CROSS)** Dr. Coomer, my understanding is that this
18 is the document that Mr. Cobb cites and quotes publicly in his
19 declaration where he says he relied on Dominion to represent
20 that the QR codes were encrypted.

21 And what it states -- what he quotes from this document
22 states, encoded data is encrypted and signed in order to
23 prevent tampering of user selection and eliminate possibility
24 of error during ballot scanning process.

25 So just to confirm, that is a surprise to you that

1 Dominion made that representation to the public, to the State
2 of Georgia?

3 MR. RUSSO: Object, Your Honor. One second. Because
4 we didn't discuss Dr. Coomer -- excuse me -- Mr. Cobb's
5 declaration on the direct or his report.

6 MR. CROSS: It goes to the security of the system,
7 Your Honor. And it is literally one question.

8 THE COURT: Go ahead. But this is --

9 **(Unintelligible cross-talk)**

10 MR. CROSS: That's right.

11 **A.** Am I surprised that that statement is in a particular
12 document that we delivered? Yes. Would I say that that is a
13 smoking gun that we misrepresented the system? No. Is there
14 an errata due from our documentation department -- because when
15 you read that whole statement, it is pretty specific that it is
16 in order to protect the integrity of the record. And that is
17 what digital signing is.

18 So did somebody inadvertently add the encryption part, I
19 mean, it appears so. Again, I haven't seen that specific
20 document. I didn't read Mr. Cobb's declaration. But as you
21 have represented it, if that is in there, then it needs an
22 errata to it. Yeah.

23 MR. CROSS: Thank you, Dr. Coomer.

24 MR. RUSSO: No follow-up.

25 THE COURT: I just have one question.

EXAMINATION

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BY THE COURT:

Q. We've been talking about the image quality and the scanning and the -- and I think you said -- I may have misunderstood -- that there is no point or that you could not adjust the -- or it wasn't relevant to be speaking about DBT {sic} resolution. And I wondered if you could clarify that.

Were you here yesterday when Dr. -- when Mr. Hursti was testifying?

A. Yes. I have been on -- I have been on the whole time.

Q. All right. So that is what I'm trying to understand. What was -- what --

A. So this is in regards to the DPI, dots per inch, of the resolution of the image. And I can categorically state that going from the current 200 DPI to some higher level of 300 DPI does not improve the accuracy of the system.

Q. Well, so your view is essentially that some of the issues that the plaintiff pointed out that they were concerned about, if you were present, in terms of the images and what was being captured and the inconsistencies in what was reported versus not will be addressed by changing -- the State's changing the standard for -- on the low side of the threshold going down to 10 from 12 percent fill?

A. Yeah. So I mean, just to put it simply, we have all seen the images. And the images clearly show the voter's mark. The

1 DPI setting would -- if there was a ballot that showed -- you
2 know, that if you had a physical ballot and you had some mark
3 on there and then you showed the image and that mark wasn't
4 there, then we could talk about DPI.

5 But the fact is we're looking at the image. The mark is
6 there, and the issue that is being raised is that mark just is
7 not crossing that threshold, the pixel count, not the fact that
8 the image is not, you know, sufficiently fine enough resolution
9 to capture that.

10 Does that make sense?

11 **Q.** I guess. But I'm trying to understand why the last
12 witness yesterday who worked in the Morgan County adjudication
13 panel, you know, and then who was running these ballots and
14 getting inconsistent results -- wholly inconsistent results for
15 some, regardless of pixels, how is that --

16 **A.** It is not -- see, that is the thing. It is not regardless
17 of pixels. So the scanners have what is called a CIS array.
18 It is contact image sensor array. That is what is used to
19 actually digitize the image of the ballot.

20 And those inherently, like all electronic systems, have
21 some variability, plus or minus ten percent. So on one scan
22 you could certainly have a target area that registers
23 2.5 percent and you round that up to 13. And on the next scan
24 it could be 11.9 percent. There is inherent variability in all
25 electronic systems.

1 So, you know, there was a statement made by that witness
2 that she would expect, quote-unquote, computers to always give
3 you the exact same answer. And anybody that works in
4 technology and electronics would argue against that, especially
5 when dealing with something like a contact image sensor. And
6 that is irrespective of the resolution setting that's on the
7 system.

8 **Q.** Well, those were some fairly significant inconsistencies
9 though. And is there anything that Dominion is recommending in
10 order to address that?

11 Because this is -- this is somebody's vote that just --
12 that was identical to somebody else's. The other just
13 simply -- depending on the way it is scanned, the incidence of
14 that being scanned, one vote is going to count and one vote is
15 not or that one precinct has a better scanner than the other
16 and everyone who gets their vote -- all their votes cast in one
17 county and not in the other.

18 **A.** I have never made that representation that we just ignore
19 people's votes, to be clear.

20 **Q.** I'm not saying you did. I'm just trying -- but that is
21 the inconsistency in counting of votes and how it is done and
22 these margins is of concern if it is just -- there is --

23 **A.** There are threshold margins. And clearly you can always
24 come up with some edge case that can demonstrate issues through
25 the variability. It is the primary reason that we provided the

1 digital adjudication system. And that is all about providing a
2 robust mechanism for ensuring that the system can interrogate
3 voter intent issues.

4 And it is certainly light years ahead of previous ballot
5 duplication boards that were relying 100 percent on human
6 interaction to identify ballots with issues.

7 THE COURT: All right. Thank you for your response.

8 THE WITNESS: Thank you.

9 THE COURT: May this witness be excused, Counsel?

10 MR. RUSSO: Your Honor, I just have one quick
11 follow-up for Dr. Coomer.

12 REDIRECT EXAMINATION

13 BY MR. RUSSO:

14 **Q.** Dr. Coomer, do you only get to these thresholds on the
15 scanner if the voter does not follow the instructions to bubble
16 in?

17 **A.** Well, certainly. I mean, that is why we have clear
18 instructions on the ballot to fully fill in the bubble. That
19 is why we recommend, you know, felt tip pens like a Sharpie.

20 But even with all of those recommendations, obviously
21 voters do what voters do. And that will always be a problem
22 with hand-marked paper ballots. Because even in a precinct
23 where you can hand a voter a Sharpie pen, the voter will go
24 to -- and I have seen this -- the voter will go to the voting
25 booth and pull out their trusty favorite pen that is not a

1 Sharpie and then they will make a faint checkmark in the oval
2 and they won't follow directions.

3 That is -- again, that is why we have -- and we have put a
4 lot of time and effort into our adjudication system to try to
5 close that gap as much as humanly possible to make sure that
6 the voter's intent is applied to all votes.

7 MR. RUSSO: Thank you.

8 THE WITNESS: Thank you.

9 REEXAMINATION

10 BY THE COURT:

11 **Q.** I'm sorry. Who builds the ballots for the project? I did
12 have that question as well.

13 **A.** So I believe -- and I think this is in my initial
14 declaration -- a Dominion employee working in the
15 state's location on-site using the state's certified installed
16 equipment built the ballots for the initial primary.

17 And I think we did the same for the runoffs, but we may
18 have had multiple employees in the State's location building
19 the ballots. And then, again, the State and the counties are
20 in charge of verifying that data and running the pre-logic and
21 accuracy to make sure that that data is correct.

22 **Q.** And that is the plan also for the general election?

23 **A.** Yeah. Again, that work is already underway. And it is --
24 again, it is all done on-site. Nothing is done off-site. It
25 is all done within the State's location.

1 Q. And tell me -- in places like Colorado or California,
2 which I know there are a number of BMDs in use, they use human
3 review for some -- for sampling of the way that the hand count
4 votes are to see whether that -- with the actual -- comparing
5 it to the actual physical ballot to see whether it is capturing
6 the ballot markings correctly.

7 A. So Colorado does have a statewide risk-limiting audit
8 process that does compare physical ballots to the images and
9 the cast vote records.

10 Is that what you are getting at?

11 Q. Yes, that is what I'm getting at.

12 A. Yeah. And there have been other pilots -- and I want
13 to -- since you asked the question, I'll be clear.

14 Risk-limiting audits is just one statistical methodology
15 of a ballot comparison audit. So a lot of times, RLA is used
16 as a catchall phrase.

17 And that is -- an RLA is a very specific implementation.
18 And not all things that are called RLAs are RLAs. And it
19 really is a ballot comparison audit.

20 THE COURT: Thank you. All right. Dr. Coomer, I
21 think that you are excused. But you are welcome to attend.

22 All right. Thank you.

23 All right. Who is the next witness?

24 MR. BROWN: Your Honor, the plaintiffs would call
25 Rick Barron.

1 THE COURT: I'm going to need one minute before we
2 start Mr. Barron. But go ahead. And then Ms. Cole will get
3 him -- all of his permissions done. All right?

4 And have you sent the documents for Mr. Barron?

5 MR. BROWN: I have, Your Honor.

6 THE COURT: All right. And who is the next witness
7 after that so that you all get that witness?

8 Hi, Ms. Ringer.

9 MR. BROWN: Who is -- I don't know who is after
10 Mr. Barron.

11 MR. McGUIRE: I think all the rest of our witnesses
12 are postponed to the end because they are dealing with
13 sensitive information.

14 MR. BROWN: Thank you. Thank you, Mr. McGuire.

15 THE COURT: Yes.

16 Ms. Ringer?

17 MS. RINGER: I'm muted. I'm sorry. The feedback --
18 I'm sorry. I just wanted to remind everyone that Mr. Barron
19 needs to be finished by 2:30. He has a flight to catch.

20 THE COURT: That's fine. Thank you though for
21 reminding.

22 You wanted to -- shall we test your audio again,
23 Ms. Ringer? Go ahead and speak.

24 MS. RINGER: Can you hear me, Your Honor?

25 THE COURT: Yes. It is -- there is a feedback.

1 But --

2 MS. RINGER: Can you mute this?

3 THE COURT: All right. We'll start in one minute.

4 And the State should consider whoever your next witness is.

5 MS. RINGER: Is this better?

6 THE COURT: That is better. Thank you.

7 Would the State -- the counsel handling the next
8 witness for the State, would you please send those also on to
9 Ms. Cole. And I'll be ready in one minute. Okay?

10 MS. RINGER: Yes.

11 **(A brief break was taken at 12:55 P.M.)**

12 THE COURT: All right. Are we ready to begin?

13 MR. BROWN: Yes, Your Honor.

14 THE COURT: Okay. Very good.

15 MR. BROWN: Should I call the witness, Your Honor?

16 THE COURT: Mr. Barron?

17 THE WITNESS: Yes.

18 THE COURT: We all look different sometimes by video.
19 So having you closer in court, you look different than on the
20 video. So I probably do too, and everything is wild.

21 So good to see you. Would you raise your right hand.

22 **(Witness sworn)**

23 THE COURT: Would you state what your location is.

24 THE WITNESS: I am in Atlanta at the county
25 attorney's office.

1 THE COURT: All right. Very good. Thank you.

2 Whereupon,

3 RICHARD BARRON,

4 after having been first duly sworn, testified as follows:

5 CROSS-EXAMINATION

6 BY MR. BROWN:

7 **Q.** Mr. Barron, I am Bruce Brown. We have met.

8 What is your position?

9 **A.** The Director of Registration and Elections for Fulton
10 County.

11 **Q.** And is Fulton County the biggest jurisdiction in the State
12 of Georgia?

13 **A.** Yes.

14 **Q.** How many registered voters do you have approximately?

15 **A.** If you include inactive, it is about 845,000.

16 **Q.** And, Mr. Barron, the September special election is
17 currently underway now; is that right?

18 **A.** Yes.

19 **Q.** And has Fulton County experienced problems with the
20 electronic Poll Pads in the September election?

21 **A.** Yes. On Tuesday.

22 **Q.** And what problems did it have?

23 **A.** There were some precincts that if the voter -- once a
24 voter checked in and went to get a card activated off the Poll
25 Pad, if more than one voter from that -- after the first voter

1 checked in on that precinct, the Poll Pad would indicate that
2 the voter had already voted and that another card couldn't be
3 created.

4 **Q.** So you only got one checked in per Poll Pad; is that
5 correct?

6 **A.** Yeah. In certain precincts.

7 We had -- we notified the vendor, KNOWiNK, on August 29
8 that we were encountering an issue. It was the same issue we
9 encountered in August. And they told us to do a hard reset,
10 which we did.

11 The Poll Pads seemed to operate normally until about
12 10:30 in those seven early voting sites. And then that issue
13 reared its head again. And we confirmed that Clayton County
14 and Dekalb County, the only other two counties in this
15 election, had the same -- same issue.

16 **MR. BROWN:** Ms. Cole, if you could pull up for us
17 Plaintiffs' Exhibit 53.

18 **Q. (BY MR. BROWN)** Mr. Barron, on the screen you should be
19 able to see what has been marked as Plaintiffs' Exhibit 53.

20 Are you familiar with the guidance from the Secretary of
21 State relating to using emergency paper ballots?

22 **A.** Yes.

23 **Q.** And pursuant to this guidance and regulations, Fulton
24 County needs to be ready to use hand-marked paper ballots
25 instead of BMDs under certain situations; correct?

1 **A.** Yes.

2 **Q.** And the guidance actually gives some detail on what you
3 are supposed to do? For example, you need to have Sharpie,
4 fine point black pens; correct?

5 **A.** Yes.

6 **Q.** And has other voting procedures that you need to follow
7 for using hand-marked paper ballots instead of BMDs; correct?

8 **A.** Yes.

9 **Q.** And you and -- you have to stock hand-marked paper ballots
10 to be used by hand in each of your voting locations already;
11 correct?

12 **A.** Yes. That's correct. We have to have ten percent of the
13 number of registered voters assigned to that precinct worth of
14 paper ballots.

15 **Q.** And your poll workers know how to use hand-marked paper
16 ballots so that they can comply with these emergency
17 procedures; correct?

18 **A.** Yes.

19 **Q.** Mr. Barron, prior to -- I didn't go into your work
20 background.

21 Prior to working for Fulton County, did you have
22 experience in election administration in jurisdictions in which
23 hand-marked paper ballots were the primary vote of elections?

24 **A.** Yes. In early -- I think in 2000 to 2002 in Travis
25 County, Texas, that was the case. And then when I was in

1 Williamson County, Texas, we did a hybrid system where at times
2 we would do early voting via DRE and election day with paper.

3 **Q.** Mr. Barron, if the Court ordered Fulton County to use
4 hand-marked paper ballots for election day, would you be able
5 to comply? Would Fulton County be able to comply with the
6 Court's order?

7 **A.** Yes. I mean, it is always -- I mean, the time -- the time
8 frame now is a little tricky just because we have already
9 prepared all of our training manuals for -- to go forward with
10 BMDs.

11 **Q.** If you switched -- if you switched out the BMDs, however,
12 it would save a lot of time, on the other hand, for a lot of
13 activities that you have to do to set up the BMDs; correct?

14 **A.** Yeah. Well, you wouldn't have the same -- the same sort
15 of time demands with regard to logic and accuracy. You
16 still -- I mean, I think there would be tradeoffs. There
17 probably would be overall less time spent preparing an election
18 day with paper than currently just because of the logic and
19 accuracy time.

20 MR. BROWN: Thank you. That is all I have, Your
21 Honor.

22 THE COURT: Anything further from any other counsel?

23 MS. RINGER: I didn't know if the other plaintiffs'
24 counsel wanted to question Mr. Barron.

25 MR. CROSS: Nothing from me, Your Honor.

1 MS. RINGER: Okay. I did have a couple of questions
2 I wanted to ask Mr. Barron.

3 DIRECT EXAMINATION

4 BY MS. RINGER:

5 **Q.** With regards to Plaintiffs' 53, Mr. Barron, is it your
6 understanding that this document is the SEB rule?

7 **A.** Yes.

8 **Q.** Okay. I want you to take a look at this document. The
9 first paragraph cites an SEB rule. The second paragraph cites
10 an SEB rule. But the paragraph that is circled and pointing to
11 the pens doesn't cite an SEB rule.

12 So is there an SEB rule that tells you specifically what
13 type of pen to utilize?

14 **A.** No, not of which I'm aware. I just -- I think this is a
15 recommended -- these are recommended pens. And this looks like
16 this is from a State -- State document. I think that Secure
17 the Vote logo up at the top means that the State made that.

18 **Q.** Okay. So it is a recommendation, but it is not SEB rules?
19 Would that be accurate?

20 **A.** I would -- I would agree with that.

21 **Q.** Mr. Barron, Mr. Brown asked you about being prepared to
22 switch to paper. Do you have any concerns about the number of
23 ballots that you would have to have at the precinct to do a
24 paper election?

25 **A.** Ordering the paper?

1 Q. If that is how you want to put it, yes, sir.

2 A. I mean, the only challenge I think would be switching the
3 whole -- the entire state, you know, finding a vendor that
4 could do that quickly and accurately.

5 You know, we aren't versed in Georgia on ordering massive
6 amounts of paper ballots. So I'm not sure how -- at this date
7 how that would impact us.

8 Q. When does early voting start for the November election?

9 A. October 12th.

10 Q. Mr. Brown asked you specifically about election day. Do
11 you have any concerns about using paper ballots for early
12 voting or advance voting?

13 A. I am -- I mean, I would not want to use paper ballots for
14 early voting. I just think it is easier to administer early
15 voting with paper -- or with BMDs or electronic voting of some
16 sort because you have all of those ballot styles that you have
17 to put into each one of the polling locations.

18 Q. How many polling locations are you expecting to have for
19 early voting?

20 A. Between permanent and outreach and our buses, we probably
21 have up to 33 locations per day operating.

22 Q. How many --

23 A. They require -- it is required that all ballot styles be
24 available in all of those locations.

25 Q. And so how many ballot styles would you have to have

1 physically on paper at these -- did you say? -- 33 locations?

2 **A.** Yeah. Well, we have 377 precincts. So we would have a
3 minimum of 377 ballot styles.

4 **Q.** And so do you have a concern about the administrative
5 problems and possible human error that could result if you had
6 377 ballot styles that people had to physically make sure were
7 presented to the correct voter at each of your 33 locations?
8 Is that accurate to say?

9 **A.** Yes. We -- in my experience with paper and early voting
10 in Texas, we had a lot of poll worker errors handing out
11 incorrect paper ballots. It was just -- there were many --
12 even when you have them in clearly marked folders or on
13 shelves, it is easy for a poll worker to -- throughout a long
14 day to grab the incorrect ballot and the voter not notice it.

15 **Q.** So is that part of the reason for saying that you would
16 not want to use paper ballots during early voting? You would
17 rather use --

18 **A.** Yes. It is just more -- it is more complicated.

19 **Q.** Mr. Barron, if we were to switch to paper ballots for the
20 November election, are you aware of whether or not you would
21 have to have more rules implemented by the State Election
22 Board?

23 **A.** You broke up. What was the last part?

24 **Q.** Are there sufficient rules by the State Election Board to
25 govern a paper ballot election for November, or would there

1 need to be more rules adopted by the State Election Board?

2 **A.** I would imagine the State Election Board would have to
3 adopt rules. I can't be specific as to what they would be.
4 But that would be a major change.

5 **Q.** We know that we had some concerns and problems with poll
6 worker training for our June election.

7 Is the poll worker training that you have now conducted
8 for -- or are conducting for the November election sufficient
9 if we were to switch to paper ballots?

10 **A.** We would have to -- we would have to basically adopt the
11 emergency procedures that we have that we trained on. Those
12 would have to be -- we would have to, I guess, adapt those
13 to -- and revamp our training procedures to make that the
14 primary mode of voting.

15 **Q.** Just one more question about, I guess, paper ballots. Do
16 you have the necessary provisions that would be needed to
17 receive, capture, and safehold an all paper ballot election?

18 **A.** We would have to acquire some things. If we were able to
19 use the paper ballot scanners, we would be able to -- the
20 current ones, then we wouldn't have to get ballot boxes.

21 But I'm sure there are quite a few things -- I haven't run
22 a paper ballot election in a while. So I'm sure there are
23 quite a few things that we would have to acquire between now
24 and election day.

25 THE COURT: I think in the interest of efficiency, we

1 had a lot of testimony about some of the challenges of this.
2 And I think I can -- all counsel were present. So I think I
3 can refer to that, if that is what you are trying to get at.

4 MS. RINGER: I was actually done with that subject
5 matter, Your Honor. I was moving to the Poll Pads next.

6 **Q. (BY MS. RINGER)** So, Mr. Barron --

7 THE COURT: As you go back to the Poll Pads,
8 Mr. Barron spoke about the problems they were having and it was
9 duplicated in these other counties.

10 Could you get that clarified for me because it went
11 very fast by me.

12 MS. RINGER: Okay.

13 **Q. (BY MS. RINGER)** Mr. Barron, could you go back and explain
14 to the Court what happened with early voting with the Poll
15 Pads.

16 **A.** Essentially, if someone came in to vote in certain
17 precincts that -- you have to get -- the Poll Pad only
18 activates the activation card or the voter card during early
19 voting. Once one person had checked in in one of about six or
20 seven precincts, what was indicated to the poll worker is that
21 the voter in front of them had already had a card activated or
22 essentially had already -- had already voted.

23 So we were unable to activate cards for certain precincts.
24 And at that point, you have to go into a procedure where you
25 have activation codes on the ballot-marking devices that allow

1 the voter -- allow the voters to -- they basically manually
2 activate it on the BMD. And from there, then the voter will
3 vote and print out the ballots. So it bypasses the Poll Pad.

4 We had notified the vendor on August 29th that we saw this
5 when we were testing it in the warehouse. They gave us a
6 recommended action because they said the configuration file had
7 an error in it. We did the hard reset that they told us to do,
8 and we tested it in the warehouse.

9 But then on Tuesday morning, once multiple people tried to
10 check in in certain precincts, that same issue arose. So we
11 had to send out what are called a cradle point and do a hard
12 reset again on those Poll Pads.

13 We haven't had the issue since. But this was an issue in
14 four precincts on election day in August as well. And we did
15 confirm with Clayton because we wanted to know if it was just
16 us or Clayton County and Dekalb County experienced the same
17 issue. And they indicated to us that they did have the same
18 problem on Tuesday.

19 **Q.** So with regards to the remedy that plaintiffs are asking
20 for here for a paper backup to the express -- I'm sorry -- the
21 electronic pollbooks, would a paper backup have been -- would
22 that have been a remedy that would have resolved the issue that
23 you just described?

24 **A.** During early voting -- it wouldn't have resolved the issue
25 during early voting. Now, if it crops up on election day, it

1 would help.

2 During early voting, we are using -- we use laptops. And
3 we can connect to one of two places to check in voters, either
4 with Easy Voter Election Net -- so we already have a backup.

5 If you do a paper pollbook for early voting, I mean, we
6 always -- we have a voters list in there anyway for early
7 voting.

8 I think what the plaintiffs want is the paper pollbook for
9 election day, which I don't have an issue with that. I think
10 what they want is for it to be updated through the end of early
11 voting. And we usually get the file from the State, I would
12 say, probably a week and a half before early voting concludes.
13 So it isn't up to date.

14 The more voters you have that are marked that have voted
15 the fewer calls you -- the precinct is going to have to make to
16 your call center. That is what that would eliminate.

17 **Q.** Let me make sure I understand what you are saying. You
18 receive a list, and you can provide a paper backup for election
19 day, but it won't be up to date? Is that accurate?

20 **A.** The one that we receive from the State currently is
21 usually produced midway through early voting. So not all of
22 the voters that have voted are in that. I think they that do
23 in order to give us time to get that printed.

24 So if we do it at the end of early voting to get that
25 paper pollbook updated, we have to do it on the Saturday before

1 we hand out the supplies. That would put more voters -- it
2 would make the list more accurate as to who has voted and who
3 still is eligible to vote if you do it at the end of early
4 voting. You just have to make sure you get that print job that
5 has to be done beginning on Saturday morning when the voter
6 file is made available.

7 **Q.** Do you have any concerns about being able to conduct that
8 print job after early voting and get it distributed before
9 election day?

10 **A.** As long as a -- as long as we can get the file to a
11 commercial printer and they can get it done on that Saturday,
12 that is fine. If for some reason the printer, you know, has
13 some sort of an issue, then you -- you run into -- you run into
14 getting -- making sure everything is done before we start
15 handing out supplies on Sunday.

16 **Q.** Would --

17 **A.** We -- you know, I think when I was an administrator in
18 Texas, we would produce it on Saturday in one of the two
19 counties I worked at. But it was -- at that point, you know,
20 20 years ago, that was an all-day -- all-day print job. And
21 there were, I think, a couple of occasions when we had to
22 deliver -- deliver paper pollbooks out on Monday because
23 everything wasn't ready.

24 **Q.** Would the provision of this paper pollbook backup
25 eliminate the need for your poll workers to have to call in if

1 there was an issue with the electronic pollbooks?

2 **A.** It wouldn't eliminate it. The more updated it is I guess
3 the better -- you know, the fewer calls they are going to have
4 to make.

5 **Q.** What else would need to be updated after the close of
6 early voting?

7 **A.** Well, you want to make sure you have all of the absentee
8 by mail -- anybody that submitted an absentee by mail ballot
9 back that we received, those would -- those would need to be
10 updated and then those that have early voted.

11 Most of those -- you are going to get -- anything through
12 Friday, those voters will be in the paper pollbooks. So the
13 more accurate you can get the list, the better it is for our
14 call center or us in taking calls.

15 It also would cut down the number of calls the poll
16 managers have to make to our office.

17 **Q.** Have you implemented any additional processes or anything
18 to deal with issues with poll workers being able to call in
19 since June 2020? Have you implemented any policies or
20 practices regarding poll workers being able to reach you on
21 election day?

22 **A.** Well, I mean, we are adding -- we had -- because of social
23 distance requirements in June, we only had one call center that
24 have 32 people in it. So we will have three call centers with
25 over a hundred people for November.

1 MS. RINGER: Thank you, Mr. Barron. I don't have any
2 more questions.

3 MR. TYSON: Your Honor, Ms. Ringer covered most of
4 what I was going to ask. I'll be brief.

5 CROSS-EXAMINATION

6 BY MR. TYSON:

7 **Q.** Mr. Barron, Bryan Tyson for the State defendants. Good to
8 see you.

9 Are you aware that the issue with the Poll Pads related to
10 a typo in the data field that was discovered on Saturday?

11 **A.** What we were told was that it was an error in the
12 configuration file. I don't know the detail of what caused it.

13 **Q.** And that issue was repaired quickly by the vendor;
14 correct?

15 MR. BROWN: Object. Leading.

16 MR. TYSON: He is not my witness.

17 **Q. (BY MR. TYSON)** Was that issue repaired by the vendor,
18 Mr. Barron?

19 **A.** Well, based on what happened on Tuesday, I'm unsure
20 because we -- we conducted the hard -- we completed the hard
21 reset. And the report that we received from the vendor on
22 Tuesday contradicts what the guys in my warehouse -- the
23 procedures they said they went through and the testing they
24 did.

25 And then we received on -- I think either it was Tuesday

1 night or Wednesday we received a report that indicated that we
2 didn't -- that the Poll Pads that reset never connected. But
3 they -- what frustrates, I guess, my warehouse is that there is
4 this ePulse dashboard out there that we don't have access to as
5 a county. And it gives you the information on the Poll Pads.

6 The Poll Pads -- if we -- we could have had that
7 information and it says that something doesn't connect
8 properly, that would enable us to be able to see what the
9 vendor is seeing and would make the process more efficient.

10 So I mean, my -- my hope is that at some point the
11 counties can get access to this ePulse dashboard in order for
12 us to see what is happening with our Poll Pads that we assign
13 to the field. Because right now we have to send everything
14 through the vendor. So it takes time to get that information
15 back.

16 And in this case, it seems to contradict what my warehouse
17 managers did. And so it gets to be that there is this
18 conflict. And it doesn't seem that it is intuitive to the
19 whole process not to have access to that ePulse dashboard.

20 **Q.** Thank you. My question is actually simpler.

21 Is early voting proceeding right now without any issues on
22 the Poll Pads?

23 **A.** Yes.

24 **Q.** And in early voting, the Poll Pads are -- are the Poll
25 Pads used to check in voters or only to encode the access

1 cards?

2 **A.** Only to encode the access cards.

3 MR. TYSON: Thank you. I don't have any further
4 questions.

5 THE COURT: Any follow-up from plaintiffs' counsel?

6 MR. BROWN: No, Your Honor.

7 THE COURT: I have a few questions especially in
8 light of Fulton County attorney's questions and also
9 Mr. Tyson's last question.

10 EXAMINATION

11 BY THE COURT:

12 **Q.** In early voting, you are not using the Poll Pads for
13 checking in a voter. But in -- on the general election day,
14 aren't you using it?

15 **A.** Yes. On election day, we use it to check in voters.
16 Early voting has a different -- has different procedures.

17 **Q.** All right. And it is really on the general election day
18 that you end up having or on -- whether it is the general
19 election or primary day in June, that's when you end up having
20 a more congested line of voters? Would that be fair to say?

21 **A.** Yes.

22 **Q.** Okay. And as I understand it, especially for highly
23 populated area such as Fulton County, then you also -- you
24 don't have endless poll workers. So people when they have to
25 spend time phoning the central office -- that takes up time as

1 well and jams up the lines more as well as any dysfunction you
2 have with the pollbook. Would that be fair to say?

3 **A.** Yes.

4 **Q.** All right. So I think the most basic question is
5 obviously printing is much faster than it was 20 years ago.

6 I understood your testimony to be that you thought it
7 would be helpful and might move things along faster so you
8 didn't have these jam-ups if you had actually an up-to-date
9 list -- listing that came out on Saturday or at worst case on
10 Sunday for you of voters -- who has voted and who has not in
11 your precinct -- whoever is going to be voting.

12 Did I understand you correctly?

13 **A.** Yes. I mean, we -- I have experience with an up-to-date
14 paper pollbook. So I think it is helpful. You know, other
15 than just getting it printed on Saturday, which is the day
16 before we hand out supplies -- other than that, there really is
17 no reason not to have the most updated paper pollbook.

18 **Q.** Now, if your pollbooks go down in a congested situation,
19 could you rely on checking people in with the -- and giving
20 them an emergency backup with the benefit of seeing the list?

21 **A.** Yeah. I think you would want to have -- the thing the
22 Poll Pads -- the nice thing about the Poll Pads is that they
23 give you the statewide list so that you can tell people that
24 are -- or if you have one just for the precinct -- you really
25 need a countywide list, and you probably need multiple lists

1 really. If you want to be able to check people in if all the
2 Poll Pads fail, you need to have enough paper precinct lists to
3 check the voters in. If you have one, you are going to be able
4 to do it but it is going to be a slower process.

5 **Q.** Having faced the challenges that you did in June and if
6 you end up having this sort of crisis, was there any reason --
7 is this a viable strategy, at least, so that you don't have
8 people potentially disenfranchised because they can't stay and
9 stand for two and three and four hours?

10 **A.** To have multiple paper pollbooks?

11 **Q.** That you are then giving them an emergency ballot.

12 **A.** Yes. I mean, you still -- you know, the way -- the way I
13 read that SEB rule, it says you shouldn't have -- you know, if
14 you have any of these emergencies like power outages,
15 malfunctions, the markers unavailable for use, or waiting times
16 longer than 30 minutes, you know, you still -- before you hand
17 out the emergency ballots, you have to check people in.

18 So I mean, I have always interpreted that waiting time is
19 longer than 30 minutes to be -- to get to the BMD rather than
20 to check in. Because you can't hand out the emergency ballots
21 unless you can get the voter checked in.

22 There would be situations where you could have people
23 waiting for BMDs where you are checking people in fast enough
24 but the BMDs aren't available because the ballot is long. And
25 at that point it makes sense to hand out paper -- emergency

1 paper ballots.

2 If it is before the voter -- if you have a long line but
3 don't have voters checked in, you can't hand out the ballots.

4 **Q.** So is that something on your mind though? I mean, I guess
5 what -- beyond, I guess, planning this -- I mean, I'm not
6 talking about 30 minutes. I'm talking more about the people
7 who are in line for 90 minutes. They can't check in because
8 you don't have enough functional --

9 **A.** Poll Pads.

10 **Q.** -- Poll Pads.

11 **A.** Yeah. I think the solution to that would be to have
12 multiple -- multiple paper pollbooks in the precincts. I mean,
13 that would be the remedy. That way you could cut a line down
14 pretty quickly if you have extra paper pollbooks and you have
15 ballots -- emergency ballots.

16 THE COURT: Thank you.

17 All right. May this witness be excused?

18 MR. BROWN: Yes, Your Honor.

19 MR. TYSON: Yes, Your Honor.

20 MR. BROWN: Thank you, Mr. Barron.

21 THE WITNESS: Thank you. Thank you, Your Honor.

22 THE COURT: Thank you. Safe travels.

23 THE WITNESS: Thank you.

24 THE COURT: And the next witness is?

25 MR. BROWN: Mr. Russo needs to be unmuted.

1 MR. RUSSO: Thank you, Bruce.

2 MR. BROWN: You are welcome.

3 MR. RUSSO: Your Honor, our next witness -- State
4 defendants' next witness is Chris Harvey.

5 There he is. Good afternoon, Mr. Harvey.

6 THE WITNESS: Good afternoon.

7 MR. RUSSO: Your Honor, do you want to swear the
8 witness?

9 THE COURT: I'll swear the witness.

10 Good afternoon, Mr. Harvey. Would you raise your
11 right hand.

12 **(Witness sworn)**

13 THE COURT: Tell us what your location is at this
14 time.

15 THE WITNESS: I'm in my office in the Secretary of
16 State's office just down the street.

17 THE COURT: All right. In Atlanta?

18 THE WITNESS: Yes, ma'am.

19 THE COURT: Very good. Do you want to commence?

20 MR. RUSSO: Yes, ma'am.

21 Whereupon,

22 CHRIS HARVEY,

23 after having been first duly sworn, testified as follows:

24 DIRECT EXAMINATION

25 BY MR. RUSSO:

1 **Q.** Good afternoon, Mr. Harvey. Can you please tell us what
2 your current position is with the Secretary of State's office?

3 **A.** I'm the elections director with the Georgia Secretary of
4 State's office.

5 **Q.** What are your responsibilities as the elections director
6 in the Secretary of State's office?

7 **A.** It is coordinating elections that go on throughout the
8 State -- most of the elections that go on throughout the State;
9 running at the elections division; coordinating with other
10 state agencies; with federal agencies like the EAC; making sure
11 that we provide essentially the hardware, training materials;
12 essentially create the atmosphere where counties can conduct
13 elections.

14 **Q.** And how long have you been involved in elections in the
15 Secretary of State's office?

16 **A.** Well, I started with the Secretary of State's in 2007. I
17 was the chief investigator from 2007 to 2015. And much of my
18 focus then was on election investigations. And then in July of
19 2015, I was appointed the elections director.

20 **Q.** I want to turn to just the upcoming election and the
21 elections schedule.

22 At a high level, could you give us an overview of the
23 election schedule for the November 3rd election.

24 THE COURT: Mr. Russo, your voice suddenly went in
25 some alternate reality. There is an echo.

1 MR. RUSSO: Your Honor, I hope we don't have another
2 situation like last time.

3 Is that better?

4 THE COURT: No. It is about the same.

5 MR. RUSSO: Okay.

6 THE COURT: I can hear you. It is just sort of a
7 whole different register somehow.

8 Shannon, can you properly record this? If everyone
9 can hear it, it is fine.

10 MR. RUSSO: Maybe if I mute and unmute, it will pick
11 up my mic better. I can try that.

12 THE COURT: All right. Thank you.

13 THE WITNESS: Do you want me to go ahead and answer
14 the question regarding the --

15 THE COURT: Let's just make sure we have Mr. Russo
16 here.

17 So you want to unmute -- Ms. Cole is not there to
18 unmute you now for a second.

19 All right. Hold on.

20 MR. RUSSO: Sorry about that.

21 THE COURT: Now you are unmuted. Let's hear you
22 again.

23 MR. RUSSO: Okay. Is that any better?

24 THE COURT: About the same. It is sort of -- it put
25 your voice at a higher register. We can understand, I think.

1 Ms. Welch, are you able to take it down?

2 All right. Go ahead.

3 MR. RUSSO: How about now?

4 THE COURT: That's not bad. There was something
5 better there when --

6 MR. RUSSO: Maybe if I move -- okay. I will not
7 move.

8 **Q. (BY MR. RUSSO)** Mr. Harvey, go ahead. I'm sorry.

9 **A.** Sure. The voter registration deadline is October 5th.
10 The first day of advance voting is October 12th. The election
11 day, of course, is November 3rd. UOCAVA deadline to get
12 ballots out to the military and overseas voters is
13 September 19, which is a week from today -- week from tomorrow.
14 And poll worker training is going to commence shortly.

15 And counties are -- we're working with the counties now to
16 do some analysis on their equipment -- distribution equipment
17 assignment and voter populations so that hopefully we can make
18 sure that there is enough equipment at the polling places so
19 they can keep everyone moving.

20 So the election is -- although voting hasn't technically
21 started, ballots haven't gone out, everybody is starting on
22 ready to go.

23 **Q.** And when does the ballot printing process begin?

24 **A.** That begins -- that began awhile ago. That began in mid
25 to late August. For the counties that didn't have runoffs, our

1 Center for Election Systems began building the ballots in the
2 middle of August. I think August 14. And then for the
3 counties that were having runoffs, they went ahead and started
4 building ballots minus anything that needed to be decided. So
5 if you had a runoff in one race, they would leave that race
6 unprinted but create the database around it.

7 It is a fairly time-consuming and tedious process to proof
8 absentee ballots -- I'm sorry -- to proof ballot databases and
9 ballot prints. And so there is some back-and-forth between the
10 ballot builders at the Center for Election Systems and the
11 counties sometimes switching it back and forth a couple of
12 times before they get it right. So that process began in
13 August and is finishing up now.

14 **Q.** And how many different ballot styles are there or will
15 there be for the November election?

16 **A.** Well, it depends on the county. Just, for example, Cobb
17 County has 80 different ballot styles. Fulton County has over
18 100 ballot styles.

19 When we talk about ballot styles, those are just the forms
20 of the ballot. If you talk about what -- Center for Election
21 Systems talk about ballot instances. Within precincts, it goes
22 up almost exponentially from there.

23 Fulton County, with over 100 ballot styles and their 300
24 some precincts, ends up with over 700 ballot instances. So
25 those are 700 different pieces of paper that you need to serve

1 every voter in Fulton County.

2 **Q.** Okay. So can you explain a little more about what a
3 ballot instance would be then.

4 **A.** Well, even if you had two polling places or two precincts
5 that were side by side and they had the same candidates on
6 them, even though they may look the same on their face, every
7 vote in Georgia has to be assigned to a precinct. So the
8 timing marks around the ballot would separate, you know,
9 precinct 21 from precinct 22.

10 And so you have to vote in your precinct. So, you know,
11 the 102 is the total number of different faces, I guess, of a
12 ballot. But then when you put those into different precincts,
13 each one has to be in its own precinct -- has to be printed for
14 its own precinct.

15 **Q.** And Mr. Barron somewhat touched on the logistics of
16 hand-marked paper ballots during early voting.

17 Could you -- could you explain, you know, if we had all
18 hand-marked paper ballots during early voting, how would the
19 logistics work for an elections official.

20 **A.** It would be -- it would be very, very challenging,
21 especially in the large counties. You have over 700 piles of
22 ballots in Fulton County in an advance voting location. And
23 you have to have a poll worker that makes sure they got the
24 right -- they got the right ballot out of 730-some stacks.

25 In Gwinnett County, it would be even worse because

1 Gwinnett County has a two-page ballot. And each of those -- so
2 that would double the number in Gwinnett. Cobb County with 80
3 ballot styles has a couple hundred ballot instances.

4 So the printing, the transporting, the securing, the
5 organizing, and then the selection by poll workers to make sure
6 they get the right ballot for the right precinct for the right
7 voter would be -- would be a huge challenge.

8 **Q.** Do you have any idea how many ballots would have to be
9 printed?

10 **A.** For advance voting?

11 **Q.** For advance voting to be able to have all hand-marked
12 paper ballots.

13 **A.** I don't have an exact number. I know that advance voting
14 up until this election comprised about 50 percent of the votes
15 that were cast. We're expecting a very, very heavy turnout.
16 We're telling the counties to get ready for a very, very heavy
17 turnout, you know, of up to 400 -- I'm sorry -- 4 to 5 million
18 voters.

19 And so with three weeks of advance voting, you know, the
20 large counties in the metro area are often going seven days a
21 week or at least six days a week, including weekends on
22 Saturday and Sunday. You would need to have hundreds of
23 thousands of ballots -- ballot pieces of paper printed and
24 transported, secured, organized, and train the people that are
25 giving them out to make sure they get it right.

1 It would be a major undertaking.

2 **Q.** On election day, how would this process using hand-marked
3 paper ballots differ from early voting?

4 **A.** Well, election day would be easier because you would
5 generally have fewer stacks of ballots to go. You would have
6 some combined precincts where you may have, you know, four to
7 five to six different stacks you would need to select from.

8 So it would certainly be easier than advance voting
9 because that too would require the poll worker to make sure
10 that they access the right ballot and present it to the voter
11 and not make a mistake in that process.

12 **Q.** In terms of -- I mean, we heard earlier -- I believe
13 opposing counsel had asked Dr. Coomer about printing companies,
14 printing vendors for Dominion.

15 Are you -- are you involved at all in the process of
16 working with the vendors to print ballots?

17 **A.** No. Our office is not. I'm not.

18 **Q.** Okay.

19 **A.** Let me clarify just a little bit. The Center for Election
20 Systems creates the ballot. They send the file to the printers
21 so the printers can print for the counties. But that is
22 basically the extent. As far as ordering ballots, no, we're
23 not involved in that.

24 **Q.** Now, the Center for Election Systems, is that under the
25 elections division in the Secretary of State's office?

1 **A.** It is not under the elections division. It is a separate
2 division in the Secretary of State.

3 **Q.** Okay. I just want to I understand that -- make sure we
4 understood that.

5 Now, Mr. Barron had discussed earlier an issue with early
6 voting in the CD 5 special election -- Congressional District 5
7 special election.

8 Are you familiar with that issue?

9 **A.** I am.

10 **Q.** And to the extent you can talk about it -- I don't know if
11 there is any SEB -- is there an SEB investigation going on
12 around that?

13 **A.** I don't believe so.

14 **Q.** I just didn't want you to talk about necessarily something
15 that, you know, we might need to be delicate around.

16 Do you know what happened?

17 **A.** My understanding is that when the -- there was an error
18 that was discovered in the file -- some technical error and the
19 Poll Pads had to be reset. The vendor, KNOWiNK, provided the
20 instructions to reset the -- I think do a hard reset or
21 upload -- do something. They gave the county instructions to
22 do that.

23 My understanding is the county believed they had done it.
24 But the KNOWiNK records indicated that while some of the Poll
25 Pads had been updated some of them had not.

1 So whether it was the county not realizing they hadn't
2 done it or not communicating back that it had been completed --
3 but in some cases, the process wasn't complete. That is where
4 they had a problem. And that is why they had to go out on the
5 day and update the Poll Pads there.

6 **Q.** And voter registration deadline for special election --
7 that is not the same deadline for, say, the August runoff;
8 right?

9 **A.** Correct. It is essentially 30 days before whatever
10 election.

11 **Q.** So --

12 **A.** The September 29 deadline is a deadline unto itself.

13 **Q.** So the Poll Pad or the pollbook would need to be updated
14 with all the new registrants; right?

15 **A.** Correct. And in advance voting, the Poll Pad doesn't even
16 check in voters. The only thing the Poll Pad does for advance
17 voting is to create the voter access card.

18 So even now, although there are Poll Pads at the polling
19 places for advance voting, they are only being used to create
20 voter access cards.

21 **Q.** Now, another issue that we briefly touched on earlier is
22 the paper electors list. Can you give us a general overview of
23 what is an electors list?

24 **A.** The electors list is every voter in the county by
25 precinct. It is something that we are required to provide to

1 the counties by law. It is a long process. It is a big
2 printing job, as you may imagine, for Fulton County, Dekalb,
3 Clayton, Cobb Counties with the hundreds of thousands of
4 voters. So we have got to produce 159 of them for the
5 counties.

6 And we usually start that soon after the voter
7 registration deadline. We try to work with the counties so
8 that they can get in as many of the voter registration
9 applications that have come in before the deadline but haven't
10 been entered. Because the more that can be entered into eNet,
11 the more complete the list is going to be.

12 So generally we ask the counties to let us know when you
13 are done with your voter registration applications. And then
14 we go ahead and we order the list. It gets printed by a vendor
15 and shipped to the county.

16 You know, the longer you wait to do that, the more data
17 you get on there when they are done. But it just takes a
18 while.

19 MR. RUSSO: Mr. Brown is waving his hand. I'm sorry.

20 THE COURT: Holly, could you -- yes.

21 MR. BROWN: I am unmuted now. And my objection is
22 moot since the witness is done. So --

23 THE COURT: All right.

24 MR. BROWN: Thank you. Thank you, Ms. Cole.

25 THE COURT: If you are going to be the one who is

1 raising objections, why don't we just leave him --

2 LAW CLERK COLE: They are muting themselves. And
3 because the default cannot let all the participants unmute
4 themselves, that is the issue.

5 THE COURT: I see.

6 LAW CLERK COLE: If they don't mute themselves when
7 they are going to be the ones making objections, that would be
8 the easiest thing for now.

9 THE COURT: All right. Everyone is so advised.

10 **Q. (BY MR. RUSSO)** Mr. Harvey, do you have an idea of the
11 number of pages that the electors list is that has to be
12 printed out?

13 **A.** Of course, it varies by county. Again, each page has
14 about 20 or 25 voters on it. So, you know, if you take 800,000
15 by 20, 25 divided and that will give you the approximate number
16 of pages.

17 THE COURT: I'm sorry. I completely missed what you
18 were saying.

19 THE WITNESS: Ma'am, I was saying that the question
20 was how many pages the electors list is. And I said that, of
21 course, it varies by county the number of voters. But each
22 page of the electors list has, I believe, 20 or 25 names. So
23 in a place like Fulton, you take the 800,000 or so divided by
24 25, and that will give you the number of pages.

25 **Q. (BY MR. RUSSO)** So statewide that number -- how many

1 voters, if you know, are registered statewide?

2 **A.** If you go with the seven and a half million or so voters
3 divided by 25 is how many pages the whole list is.

4 **Q.** I get it. Now, if paper ballots -- actually the paper
5 electors list were to be printed in the time after the close of
6 early voting ended, in your experience, would that be possible?

7 **A.** It would be -- it wouldn't be possible to do -- to be done
8 the way we currently do it. If a -- if a county could get the
9 list and get it printed itself by some print company, I suppose
10 it is possible.

11 Again, I'm not familiar with how long it would take to
12 print a list with the number of voters Fulton County has. But
13 presumably if a printer could do it, they could do it. But we
14 couldn't do it the way we do it now.

15 **Q.** And the Secretary of State's office provides one list to
16 each county?

17 **A.** That's correct.

18 **Q.** And are counties able to print their -- make copies of
19 that list?

20 **A.** They could. Yes.

21 **Q.** Okay. I want to turn to the absentee ballots and
22 tabulation of absentee ballots.

23 Are you familiar with the scanning process of hand-marked
24 paper ballots?

25 **A.** Generally, yes.

1 Q. Are you aware of reasons an absentee ballot may not be
2 able to be scanned?

3 A. Yes.

4 Q. And are you aware of -- well, can you tell us some of
5 those reasons?

6 A. Well, in terms of not being able to scan, if it was torn,
7 if it was creased, if it was -- if it was wet -- if it got
8 somehow wet, it wouldn't go into the scanner. The scanner
9 wouldn't accept it. So that is sort of the first case.

10 The second case would be where it would go into the
11 scanner but then for some reason the scanner may not be able to
12 read what is on the ballot.

13 Q. Okay. What would be a situation where the scanner would
14 not be able to read what is on the ballot?

15 A. Well, if it didn't detect any marks in the area of the
16 target area where it is looking for votes, it would -- it
17 would -- I mean, it wouldn't be able to read anything because
18 it is not seeing anything.

19 If it could -- it could kick back a ballot if there were
20 extraneous marks, if there were overvotes in a race, or if
21 there were some other problem reading the ballot for some
22 reason. If the ink had gotten smudged, again if something wet
23 had gotten on it and it smeared some of the timing marks, it
24 could well -- very well not be able to be read.

25 Q. Now, can you describe for us the duplication process that

1 occurs?

2 **A.** Sure. If a ballot is kicked back for some reason, either
3 because it has an overvote, it has got a stray mark, the law
4 requires a ballot review committee to evaluate that ballot.
5 And it is made up of the election superintendent. And then in
6 a partisan election, you have a representative of each of the
7 parties. They would look at the ballot either by hand holding
8 it out in front of them or they could do it on a digital screen
9 in our new system.

10 And it would be up to that three-person panel to determine
11 what was happening. Is there a clear intent of a voter to cast
12 a vote for this person? Is it clearly a stray mark where
13 somebody's pen may have just drifted across an area where there
14 was otherwise a clear mark of the voter? Or if they couldn't
15 determine if there was a true overvote where somebody voted for
16 two candidates in a race where they could vote for one, they
17 would have to essentially declare it an overvote and not give a
18 vote to anyone.

19 So once they come to that conclusion, the ballot is either
20 duplicated physically, if they are doing what is called manual
21 adjudication and physically holding and looking at the ballot,
22 or in the digital adjudication they can actually adjudicate it
23 on screen and give the credit for whatever they determine the
24 vote to be.

25 **Q.** Now, you mentioned ambiguous marks. Did the State

1 Election Board pass a new rule on threshold -- on scanner
2 threshold settings?

3 **A.** They did.

4 **Q.** And I want to show you what is --

5 MR. RUSSO: Ms. Cole, we have a document -- it has
6 previously been filed as 793-1. And it is in the email that
7 Mr. Miller sent to you.

8 LAW CLERK COLE: The State Election Board rule?

9 MR. RUSSO: Yes, ma'am.

10 THE COURT: While she's pulling that up, I'm going to
11 just take one minute. All right. So just pause for one
12 minute.

13 **(A brief break was taken at 1:54 P.M.)**

14 THE COURT: Go ahead. You can go ahead.

15 MR. RUSSO: Yes, ma'am.

16 THE COURT: Holly is not back. Never mind, you can't
17 go back.

18 LAW CLERK COLE: I am here.

19 THE COURT: Go ahead.

20 MR. RUSSO: Thank you, Your Honor.

21 **Q. (BY MR. RUSSO)** Mr. Harvey, I'm showing you what has been
22 filed in this case already. And it is the notice of intent to
23 post rule of the State Election Board.

24 Have you seen this before?

25 **A.** Yes, I have.

1 Q. Are you familiar with what this is?

2 A. Yes.

3 Q. And tell us what this is.

4 A. This is a notice -- a public notice that the State
5 Election Board is going to consider adopting a rule and give
6 the opportunity for citizens to give public comments --

7 Q. Go ahead.

8 A. -- and just to see the process or join in the process.

9 MR. RUSSO: Ms. Cole, could you please scroll down to
10 Page 4 of that document -- the ECF number Page 4. I don't know
11 if Mr. Harvey can see. The rule starts at the bottom.

12 Ms. Cole, if you could scroll down a little further. I'm
13 sorry. It is for the start of the rule. That works.

14 Q. (BY MR. RUSSO) Mr. Harvey, I'm showing you what is the
15 proposed rule. I just want to confirm because we don't have
16 the promulgated version.

17 But is this version of the proposed rule -- is this the
18 same as what the SEC promulgated?

19 A. The SEB did adopt the rule yesterday.

20 Q. Do you know if there were any changes to this -- to the
21 proposed rule that was ultimately adopted?

22 A. There were not.

23 MR. RUSSO: You can take that down, Ms. Cole. Thank
24 you.

25 We would like to -- I guess it is already in the

1 record. So it should be fine.

2 Your Honor, we would like to admit that. I don't
3 know what number State defendants' exhibit we're on. But we
4 would like to admit that.

5 THE COURT: Do you have an exhibit number on it right
6 now?

7 MR. RUSSO: No, ma'am, I don't. I do not
8 unfortunately. It is 9 -- Exhibit 9.

9 THE COURT: Exhibit 9. Any objection?

10 MR. RUSSO: We can file that later.

11 MR. CROSS: No, Your Honor. No objection.

12 THE COURT: Hearing no objection, it is admitted.

13 **Q. (BY MR. RUSSO)** Mr. Harvey, in developing that rule, did
14 the Secretary of State's office conduct any kind of research or
15 assess different threshold settings on the scanners to reach a
16 number to propose?

17 **A.** Yes, we did.

18 **Q.** And do you know who all was involved in that process?

19 **A.** That was primarily done at the Center for Election
20 Systems, which is run by Michael Barnes and his team. Ryan
21 Germany, I believe, also is part of that, as was -- I believe
22 Kevin Rayburn was too.

23 **Q.** I want to show you --

24 MR. RUSSO: Ms. Cole, if you could please put up the
25 other document that is 887-4 that Mr. Germany -- excuse me --

1 Mr. Miller emailed to you.

2 Thank you. And could we scroll to the second page.

3 Thank you.

4 **Q. (BY MR. RUSSO)** Mr. Harvey, have you seen this document
5 previously?

6 **A.** Yes, I have.

7 **Q.** And are you -- do you know who drafted this document?

8 **A.** Michael Barnes.

9 **Q.** Okay. And I know it says draft across the front. But
10 is -- do you know if this document is -- was something that was
11 used or compiled as part of the research for developing the
12 rule?

13 **A.** It is my understanding that it did. I wasn't directly
14 involved in the drafting of this. But I know when they were
15 talking about that rule we were talking about performing some
16 of these demonstrations and some of these tests to see what the
17 scanning levels were.

18 MR. RUSSO: Okay. And, Your Honor, State defendants
19 would like to have this admitted as Exhibits -- Exhibit 9 and
20 not for the truth of the matter asserted, Your Honor. It is
21 simply to show that -- to confirm that research was conducted.

22 THE COURT: Are there objections?

23 LAW CLERK COLE: Do you mean Exhibit 10? We just had
24 -- the prior exhibit was Number 9.

25 MR. RUSSO: I'm sorry. One of my colleagues just

1 came in and said that would be Exhibit 4. We used that
2 document yesterday, Your Honor. That was -- that document was
3 used on the impeachment of Mr. Hursti. And there was a
4 question then about being able to get it in through Mr. Hursti.
5 So it is already Exhibit 4 on the record.

6 MR. BROWN: Your Honor, we would object. This
7 witness knows nothing about this draft by Mr. Barnes. They did
8 not want to call Mr. Barnes to defend it. But they would need
9 to do so to get it into evidence.

10 MR. RUSSO: Your Honor, we're not -- this document is
11 not for the truth of the matter asserted in the document. This
12 document is merely to show that research was conducted. And
13 Mr. Hursti had said yesterday regarding the threshold that the
14 State should -- should not set a threshold without conducting
15 research.

16 Mr. Harvey has seen this document and is aware of the
17 research that was being conducted in the development of the
18 rule. So it is not being provided for purposes of the contest
19 but so much to show that there was research being performed.

20 THE COURT: Well, this is not a jury trial. So I'm
21 going to admit it. I think that you are introducing it a
22 little bit for the truth of the matter. It is not so -- you
23 are trying to reflect that there was research done. And I
24 don't know what the nature of the research was. But that is --
25 but there is no point in not letting you get it in at this

1 point.

2 MR. RUSSO: Thank you, Your Honor.

3 **Q. (BY MR. RUSSO)** Now, Mr. Harvey, with respect to the SEB
4 rule that was ultimately promulgated --

5 MR. RUSSO: And, Ms. Cole, you can take this down.

6 **Q. (BY MR. RUSSO)** Are you aware of the threshold settings
7 that the SEB ultimately approved?

8 **A.** Yes, I am.

9 **Q.** What were those?

10 **A.** 10 low end, 20 percent high end.

11 **Q.** And I know you stated a minute ago that you -- in terms of
12 scanner threshold settings that -- you know, that Mr. Barnes
13 was involved in that.

14 But are you aware of additional research that was
15 conducted outside of what Mr. Barnes -- Mr. Barnes performed?

16 **A.** Not -- I'm not aware of specific research that was
17 conducted.

18 **Q.** So the Center for Election Systems performed the bulk of
19 the work to determine the 10, 20 percent threshold?

20 **A.** That is my understanding. They did the -- they did the
21 tests.

22 **(There was a brief pause in the proceedings.)**

23 **Q. (BY MR. RUSSO)** Mr. Harvey, I don't have much more to ask
24 you about. But I do want to touch on the issue regarding the
25 setting up of polling places.

1 You provided draft guidance for the counties on how to
2 properly set up the BMDs in the polling places; is that right?

3 **A.** That's correct.

4 **Q.** Can you tell us -- explain to us what guidance you
5 provided.

6 **A.** Well, I had traveled to south Georgia to meet with some of
7 the pilot voting in some of the early elections and special
8 elections we had. And I noticed that some of the polling
9 places -- and a lot of places were small, didn't have a lot of
10 space. And sometimes they set the BMDs so that they were
11 facing essentially where the people would come in.

12 And so I said, look, if everything else is equal, turn
13 them a different way. Turn them so they face the wall or turn
14 them so they face a different direction.

15 So I came up with a couple of sketches, which then
16 somebody in our office actually made look nice. I didn't
17 square the boxes and arrows. But just to show that -- you
18 know, county election officials are sometimes creatures of
19 habit. In the past, they would set up the DREs in a certain
20 way. And they continued to set up the BMDs. And the BMDs had
21 a different footprint. They are larger. They take up more
22 space.

23 So I was really trying to get them to realize that just
24 because you have always set them up facing this way it can
25 still potentially pose a problem. If you can do a simple fix

1 like turn it a different direction, do that. Do everything you
2 can to ensure the privacy and the secrecy of the vote.

3 **Q.** Are those -- are those layouts that you just described --
4 are those attached to your declaration that you provided in
5 this case?

6 **A.** Yeah. I believe so, yes.

7 MR. RUSSO: And, Your Honor, just for reference --
8 we're not going to go back over them. But they are at Document
9 834-3, Pages 8 through 11.

10 **Q.** **(BY MR. RUSSO)** Mr. Harvey, one last question -- well, two
11 quick questions.

12 Do you know if the Secretary of State's office received
13 any complaints during the June primary regarding the setup of
14 BMDs?

15 **A.** I believe we did get -- we did get a handful of complaints
16 along those lines.

17 **Q.** And is this something that the SEB if you know has the
18 authority to -- well, I should back up.

19 Is the SEB investigating those complaints?

20 **A.** I'm not sure at this point. Some of the complaints go to
21 the investigation division, and they would decide whether or
22 not to open an investigation depending on the nature of the
23 complaint. I don't know that there is a specific investigation
24 on that issue open currently.

25 MR. RUSSO: Okay. No more questions, Your Honor.

1 MR. CROSS: Your Honor, David Cross. May I proceed?

2 THE COURT: Yes.

3 CROSS-EXAMINATION

4 BY MR. CROSS:

5 Q. Good afternoon, Mr. Harvey.

6 A. Good afternoon, Mr. Cross.

7 Q. You testified a little while ago that to use hand-marked
8 paper ballots as the primary voting method on election day or
9 in early voting the poll workers would have to be trained on
10 that to make sure they give out the right ballots, for example,
11 you said; right?

12 A. Yes.

13 Q. They are already trained to do that -- right? -- because
14 of your emergency paper ballot backup?

15 A. Well, they are trained on the concept of doing it. It is
16 up to the counties to make sure that they execute the actual
17 training. And the poll worker training -- keep in mind when
18 somebody does the poll worker training, they are generally
19 getting training on the large system.

20 But, for example, if you went to a polling place, you
21 would have to identify where the ballots were, you would have
22 to make sure they are labeled, and you have to do that. So
23 there would be extra steps that are required.

24 But I agree that generally they should be familiar with
25 the process of handing out paper ballots.

1 Q. Mr. Harvey, just to be clear, the emergency paper ballot
2 plan that is distributed by the State to the counties requires
3 voters -- it states, voters shall scan their ballot in the
4 scanner connected to the ballot box, just like a BMD ballot;
5 right?

6 A. Yes.

7 Q. And so -- and we're talking about emergency ballots that
8 are marked by hand; right? You understand what we're talking
9 about?

10 A. I do.

11 MR. RUSSO: Your Honor, I'm going to go ahead and
12 object that this is outside the scope of direct. I did not ask
13 Mr. Harvey about emergency paper ballots.

14 MR. CROSS: Your Honor will recall we deferred him to
15 their case. It is not a proper objection.

16 THE COURT: Go ahead.

17 Q. **(BY MR. CROSS)** Did I understand you to say that the CES
18 creates the ballots?

19 A. Yes. When I say create, they create the database that the
20 ballot results in. So they would create the database that
21 either ends up on a BMD or that gets sent to the printer for a
22 paper ballot. But they don't print the ballots themselves.

23 Q. Who creates the ballots? CES or Dominion?

24 A. I'm sorry. CES or --

25 Q. Who creates the ballots for Georgia? Is it CES, or is it

1 Dominion?

2 **A.** Well, CES is working with Dominion to create the ballots.
3 Dominion is providing training and guidance so CES would be
4 able to do it independently. But Dominion is working with
5 them.

6 **Q.** Do you have an idea of how many ballot-on-demand printers
7 are available across the state roughly?

8 **A.** I know every county has one. So that would be 159. And
9 some of the larger counties have four or five. So probably
10 another 50 or so. So I would say probably between 200 and 250.

11 **Q.** And the ballot-on-demand printers enable the poll workers
12 to print whatever ballot style is needed for any particular
13 voter who shows up to vote, if it is needed; right?

14 **A.** Well, the ballot-on-demand printer is generally kept at
15 the election office. So when you are talking about poll
16 workers doing it, it is not something that would be at a
17 polling place for a poll worker to operate. But it does allow
18 the operator to print any ballot.

19 **Q.** Thank you. When a ballot is flagged as ambiguous in the
20 system, there is an adjudication or voter review panel who
21 reviews that ballot to determine whether it can figure out the
22 intent of the voter and whether that vote should count; right?

23 **A.** That's correct.

24 **Q.** Do I understand correctly that what the panel reviews is
25 the scanned image -- the low grade image from the scanner as

1 opposed to the paper ballot itself?

2 **A.** Well, they can do it one of two ways. They could review
3 the actual ballot itself if they set it up for what is called
4 manual adjudication. Or they can do it through digital
5 adjudication where they look at a copy of the scan of the
6 ballot on a screen. They can do it either way.

7 **Q.** Is digital -- is that the default? Is that how it is
8 typically done in Georgia?

9 **A.** Well, I don't think there is a default. Each county
10 decides. I know in the first -- in the June election, some
11 counties were hesitant to use the digital. And so they stuck
12 with the old-fashioned way. But I think more of them have
13 adopted digital. But I couldn't tell you the percentage.

14 **Q.** So if a digital scan in the low grade image did not pick
15 up a selection by a voter, the panel wouldn't see that --
16 right? -- if that is what they are looking at instead of the
17 paper ballot?

18 **A.** Well, the -- you are talking about the digital scan. So
19 are you talking about the digital image of the ballot?

20 **Q.** Yes.

21 **A.** If the -- well, the whole reason the image would be in
22 front of the voter review committee is because it didn't -- it
23 either picked up an overvote or it didn't pick up something or
24 it picked up something it didn't see. So that is what would
25 get it in front of the committee. And then the committee would

1 be looking at the image that was taken of the ballot passed
2 through scan. So what got it in front of that committee could
3 be any number of things.

4 **Q.** You have been the elections director for Georgia since
5 2015; is that right?

6 **A.** That's correct.

7 **Q.** I didn't see any discussion in any of your declarations
8 about any forensic examination or security assessment of the
9 Dominion BMD system in Georgia; right? You don't discuss that?

10 **A.** I don't think I was -- I don't remember that as being part
11 of any declaration.

12 **Q.** Are you aware that Fortalice Solutions -- I'm not going to
13 ask you about the substance I just want to note.

14 Are you aware that Fortalice Solutions conducted some sort
15 of assessment of the Dominion BMD system last fall?

16 **A.** I'm familiar they did one. I didn't know when it was
17 done.

18 **Q.** Were you part of that?

19 **A.** I was not.

20 **Q.** Were you involved?

21 **A.** No.

22 **Q.** Have you seen that report?

23 **A.** I have not.

24 **Q.** Is it fair to say that you are not aware of any remedial
25 measures that were taken as a result of that report?

1 **A.** I don't know of anything that was done specifically as a
2 result of the report.

3 **Q.** As the Georgia elections director, do you know whether
4 there has been any connectivity between the prior DRE GEMS
5 system and the new BMD system?

6 **A.** Any connectivity?

7 **Q.** Yeah. Any connections, like wires connected, use of
8 removable media, anything that would have created connectivity
9 between the old system and the new.

10 **A.** I'm not aware of any. I can't say it hasn't happened, but
11 I'm not aware.

12 MR. CROSS: Ms. Coomer -- I'm sorry. Ms. Cole, can
13 we get Exhibit 37? If you would scroll down to the bottom of
14 the first email in the chain. Thank you.

15 **Q.** **(BY MR. CROSS)** Mr. Harvey, are you familiar with Dedrick
16 Smith and Scott Tucker at Dominion?

17 **A.** I'm familiar with Scott Tucker. I don't know that I know
18 Dedrick Smith.

19 **Q.** You see at the bottom there is an email from Dedrick Smith
20 to Scott Tucker at Dominion that says, I was wondering if you
21 could ask the State if there is a special USB they are supposed
22 to be sending out to the counties to submit their L&A reports
23 and the exports for election day. They have a USB that they
24 normally send the export files on, but they are old.

25 Do you see where I am?

1 **A.** Yes.

2 **Q.** If you come up, you will see Mr. Tucker forwards this on
3 to Michael Barnes on January 15. Do you see that?

4 **A.** I do.

5 **Q.** And Michael Barnes is the head of CES for the State?

6 **A.** Yes.

7 **Q.** And Mr. Tucker writes, Michael, is the State providing new
8 USB drives for the counties to send their L&A exports and E
9 day -- E day is election day; right?

10 **A.** I would assume so.

11 **Q.** -- and election day exports to you, or should they use the
12 USB drive they have from the previous system? Are you with me?

13 **A.** I am.

14 **Q.** And if you come up to the top, Mr. Barnes, the head of
15 CES, writes back to Mr. Tucker at Dominion --

16 MR. RUSSO: Objection, Your Honor. If Mr. Cross
17 wants to read this into the record, that is one thing. But
18 Mr. Harvey is not on the email chain. He stated that he is
19 not -- CES is not under his division and that he was not
20 involved -- that he is not involved in this aspect of running
21 the elections.

22 THE COURT: He's being asked about what was -- what
23 was the interface, were there any interfaces. And he is being
24 asked about this. And it is obviously a legitimate document
25 gotten from the State. And I let you put your -- something

1 else that Mr. Barnes developed right in front of me.

2 So I don't know how much longer this is going to go.

3 But is this it?

4 MR. CROSS: Yeah. Just the last email.

5 THE COURT: All right.

6 **Q. (BY MR. CROSS)** Do you see that Mr. Barnes responds, they
7 can use the USB that the State has previously provided? Do you
8 see that?

9 **A.** Yes.

10 **Q.** The State's counsel has anticipated where I was going,
11 which I was going to ask you: As the State elections director,
12 did you know that this was the advice that was given out to use
13 USB drives from the old GEMS system with the new system as of
14 January of this year?

15 MR. RUSSO: Again, Your Honor, I'm going to object.
16 Mr. Harvey is -- he has not asked Mr. Harvey's email before
17 unlike the memo document that Mr. Barnes had drafted for
18 purposes of creating the threshold scanner settings rule.
19 Mr. Cross is using this document to obtain testimony on the --
20 on the actual document -- the truth of the document.

21 THE COURT: What he's asking is, did you know about
22 this? So --

23 MR. RUSSO: Which is in the document.

24 THE COURT: He asked him did he know about this
25 information. He is allowed to ask about that. Overruled.

1 **Q. (BY MR. CROSS)** Did you know?

2 **A.** I honestly don't know whether I knew or whether I ever saw
3 this email or this was brought up to me. I don't remember
4 having a specific conversation about this.

5 MR. CROSS: Ms. Cole, can we bring up number --
6 Exhibit 40?

7 LAW CLERK COLE: I don't believe I have an
8 Exhibit 40.

9 MR. CROSS: Oh. All right. We'll skip it and come
10 back to it. Sorry, Ms. Cole.

11 THE COURT: Are we -- I want to make sure that we
12 don't have somebody's email on this.

13 MR. CROSS: I think that is Ms. Cole's email. Yep.
14 That is it.

15 **Q. (BY MR. CROSS)** Mr. Harvey, do you see at the top of
16 Exhibit 40 there is an email from you to Mr. Tucker and others
17 on June 9, 2020, the date of the primary election in Georgia?

18 **A.** Yes.

19 **Q.** And I'll ask Ms. Cole if she will just scroll through for
20 a moment so you can take a look at it.

21 Then just tell me if you recognize this as an email that
22 you sent.

23 **A.** Although I don't specifically remember, that clearly
24 appears to be something that I sent.

25 MR. CROSS: If we could just get to the middle of the

1 first page, Ms. Cole. Thank you.

2 **Q. (BY MR. CROSS)** Do you see there is an email from Janine
3 Eveler, the director of elections for Cobb, on June 9?

4 **A.** I do.

5 **Q.** And because of the BMDs that were happening at this time
6 in Cobb County, she indicates that they were using paper
7 ballots.

8 Do you see that?

9 **A.** Yes.

10 **Q.** It is fair to say that the poll workers that were handling
11 the paper ballots at that time were sufficiently trained to use
12 those to be marked by hand as backup ballots? You don't doubt
13 that, do you?

14 **A.** No. From what I gather from this email, I assume they are
15 issuing them properly.

16 MR. CROSS: Could we get 41, Ms. Cole. Thank you.

17 **Q. (BY MR. CROSS)** Do you see this is an email from Ryan
18 Germany to you and others again on the date of the primary
19 election this year?

20 **A.** Yes, I do.

21 **Q.** This one concerns problems at the Cross Keys High School
22 in Dekalb. Do you see that?

23 **A.** I do.

24 **Q.** And I'm not going to read through the substance of each of
25 these. But you do see that here there was a problem of a crowd

1 of 100 voters lined up for hours? Do you see that?

2 **A.** I see that is what the newspapers said.

3 **Q.** And -- okay. Never mind.

4 MR. CROSS: 42, Ms. Cole, please.

5 **Q. (BY MR. CROSS)** Do you see this is another email -- you
6 sent this one again on the election day, June 9? This was
7 involving machines that were not working at South Atlanta High
8 School? Do you see that if you scroll down? Six -- only one
9 of the six machines were working so they had to go to absentee
10 ballots?

11 **A.** I see that.

12 **Q.** And when the indication here is they went to absentee
13 ballots, you understand that is actually the emergency backup
14 ballots by hand at the polls; right?

15 **A.** Correct.

16 MR. CROSS: 44.

17 **Q. (BY MR. CROSS)** Do you see here is another email that you
18 forwarded on to Mr. Barron and others again on the election
19 day, June 9? This one is dealing with Fulton County.

20 **A.** I can't read that.

21 **Q.** I'm sorry.

22 **A.** Can we move it a little bit?

23 MR. CROSS: Are you able to zoom in? Yes. Thank
24 you.

25 THE WITNESS: I'll be able to read that if she

1 scrolls down.

2 MR. CROSS: Ms. Cole has become quite the pro at this
3 in a hurry. She's going to put our trial graphics people out
4 of business.

5 **Q. (BY MR. CROSS)** So do you see this one is a complaint that
6 you forwarded on where a voter had been waiting over three
7 hours because machines were down? Do you see that?

8 **A.** I do.

9 MR. CROSS: 45. And I only have two more of these.

10 **Q. (BY MR. CROSS)** Do you see at the top this is an email
11 that you received from Gabriel Sterling on June 9? Again, so
12 we are still on election day in the primary. Are you with me?

13 **A.** Yes.

14 **Q.** And remind the Court who is Gabriel Sterling.

15 **A.** Gabriel Sterling is the voting system implementation
16 manager with the Secretary of State's office.

17 **Q.** This one involves machines -- it indicates only half of
18 the machines were working. This is at Christian City Welcome
19 Center in Union City, Georgia. Voters had been waiting for six
20 hours.

21 Do you see that?

22 **A.** I do.

23 **Q.** The last question I have for you on those documents,
24 Mr. Harvey -- you can see the year on all of those emails. Do
25 you know why the State did not produce those to us -- why we

1 obtained those from Dominion and not the State?

2 **A.** I have no idea. I wasn't part of any record collection.

3 **Q.** So you have not been involved in any effort to collect
4 documents for this case?

5 **A.** No. No, sir. I mean, I produced -- I have done
6 declarations, and I may have given a document here or there.
7 But as far as a large scale record gathering, no.

8 **Q.** Almost done, Mr. Harvey. You agree that any person in the
9 State of Georgia who is a legitimate voter can choose to vote
10 an absentee ballot by paper for any reason or no reason; right?

11 **A.** Yes. An eligible registered voter can do that for any
12 reason or no reason.

13 COURT REPORTER: I need you to speak up, sir.

14 THE WITNESS: I said, yes, any eligible registered
15 voter can vote an absentee ballot for any reason or for no
16 reason.

17 **Q.** **(BY MR. CROSS)** And there is no limit on the number of
18 voters in the state that can vote by absentee ballot; right?

19 **A.** That is correct.

20 **Q.** And when we say absentee, we're talking about hand-marked
21 paper ballots; right?

22 **A.** I assume that is what you mean. Now, we generally
23 consider in-person advance voting. That is considered absentee
24 also. But I think I understand you to mean the mail-in ones.

25 **Q.** Right. And, in fact, this year voters are encouraged and

1 expected to use hand-marked paper ballots as absentee ballots
2 even more than in the past because of the ongoing health
3 situation; right?

4 **A.** I would agree with that, yes.

5 **Q.** So you are expecting perhaps many more hand-marked paper
6 ballots to handle this year than in any prior year; right?

7 **A.** Yes.

8 **Q.** And you are not suggesting today that the Court is -- or
9 that the State is not equipped to handle that; right?

10 **A.** No, I'm not. We have made adjustments and are prepared
11 to -- we made it easier for people to request absentee ballots
12 and made it easier for them to get out to folks, provide
13 equipment so they can tally them when they come in. So --

14 **Q.** And just the last couple of questions. The voters in
15 Georgia can request an absentee ballot to mark by hand up
16 until, say, a few days before the election, as long as they get
17 it returned to the State in time to be counted; right?

18 **A.** Correct.

19 **Q.** So if you had a flood of absentee ballots leading up to
20 the election, you are not suggesting that the State cannot
21 handle that? That you wouldn't be able to print those ballots
22 or get those ballots from voters; right?

23 **A.** I'm not -- that would be -- at that point, that would be a
24 county responsibility to make sure they got the ballots out if
25 they got a last minute request. So the county would have to be

1 prepared to deal with the rush at the end.

2 **Q.** You are not suggesting to the Court that the counties
3 could not do that; right?

4 **A.** No, I'm not suggesting they can't. We have told them to
5 be prepared for a very heavy turnout in all phases.

6 MR. CROSS: Thank you.

7 MR. RUSSO: Your Honor, I --

8 MR. CROSS: Your Honor, I apologize. I did have one
9 more document. I'm very sorry. It just didn't relate to the
10 other subject.

11 Ms. Cole, do you mind pulling up 51?

12 **Q. (BY MR. CROSS)** Mr. Harvey, if you look at the top of this
13 one -- and I'm not going to walk you through it. But do you
14 see that this is an email that you received from David
15 Greenwalt again on June 9, the date of the primary election?

16 **A.** I do.

17 **Q.** I'm sorry. Do you see that?

18 **A.** I do see that, yes.

19 **Q.** And Mr. Greenwalt here is with KNOWiNK; right?

20 **A.** That's correct.

21 **Q.** At the bottom, there is an email where you are writing to
22 Mr. Greenwalt and you wrote, Poll Pad comments, referencing the
23 email below, and observations from a pretty good county
24 elections director.

25 Do you see that?

1 **A.** I do.

2 **Q.** Do you recall this email where the county elections
3 director here identified a number of problems with the Poll
4 Pads?

5 **A.** I can see the email. I may remember it. No, I think --
6 go down so that I can see the first part.

7 I generally remember communicating with her on election
8 day, and I generally remember this email. Again, I don't know
9 that I could independently recall everything in it. But yeah,
10 I believe -- when I sent that note to Ms. Greenwalt, I remember
11 putting that thing about a pretty good election director.

12 MR. CROSS: Thank you.

13 THE COURT: Could I see the rest of it? I'm sorry.
14 Could you put it back up, Ms. Cole?

15 All right. Thank you.

16 MR. CROSS: It goes on for a couple of pages, Your
17 Honor.

18 THE COURT: All right. What number was this?

19 MR. CROSS: 51.

20 THE COURT: And have you introduced it?

21 MR. CROSS: Yeah. I move into admission all of the
22 exhibits that I just used, Your Honor.

23 THE COURT: Are there objections? I know that -- the
24 objection is noted as to the ones that were presented to the
25 witness that he was not copied on. I don't know which numbers

1 those were.

2 MR. CROSS: That was Exhibit 37.

3 MR. RUSSO: What were the exhibit numbers, David?

4 I still have that objection, of course. But the
5 others, no objection.

6 MR. CROSS: Thank you.

7 MR. RUSSO: What were those exhibit numbers?

8 MR. CROSS: Let me pull them up.

9 MR. RUSSO: I'll reference them on redirect.

10 MR. CROSS: It is Exhibit 40, 41, 42, 44, 45. And I
11 think 51 is the last one.

12 MR. RUSSO: Okay.

13 MR. CROSS: He is your witness, Mr. Russo.

14 THE COURT: I note the objection. I'm going to admit
15 all the documents. I don't want to have -- at this point have
16 the plaintiffs have to subpoena Mr. Barnes to identify a
17 document that seems to be associated with the elections also.
18 So if defendants want to address it in some other manner, that
19 is fine.

20 MR. RUSSO: Thank you, Your Honor.

21 REDIRECT EXAMINATION

22 BY MR. RUSSO:

23 Q. Mr. Harvey, I just have a couple of quick points to follow
24 up on. I will first --

25 MR. RUSSO: And, Ms. Cole, if you could, please bring

1 up Exhibit 40, I believe. It is the first one. Can you scroll
2 up, please? No, that is not the document.

3 David, what was the first document you put up?

4 MR. CROSS: The first one was Exhibit 37, the Michael
5 Barnes one that you objected to.

6 MR. RUSSO: Okay. Yes. That is what I was looking
7 for.

8 **Q. (BY MR. RUSSO)** Thank you. Mr. Harvey, I know that you
9 are not on this email. But the email states that they can use
10 the USB that the State has previously provided.

11 Now, do you know whether Mr. Barnes was referring to a USB
12 from the old election system or just one that had been
13 previously provided to the point of this email?

14 **A.** I don't know.

15 **Q.** Thank you.

16 MR. RUSSO: And that is enough for that document.
17 Thank you, Ms. Cole.

18 I believe the next one would be Exhibit 40. Could
19 you scroll down, please.

20 That's fine. You can -- this is going to be too
21 difficult of a process, I think. I can get through asking
22 Mr. Harvey the question.

23 This is fine. Sure.

24 **Q. (BY MR. RUSSO)** Mr. Harvey, when the State receives a
25 complaint that goes into the complaint inbox, what is the

1 complaint inbox?

2 **A.** The complaint inbox is an inbox that if somebody wants to
3 file a complaint from our web page or any comment or anything
4 like that they click on that link and it takes them to a form
5 where they complete the information that you see there, their
6 name, their telephone, email, county, nature of call, et
7 cetera. And that comes to an inbox that is monitored by the
8 elections division.

9 **Q.** Okay. Now, this email here is -- does not appear to be
10 the complaint inbox; is that right?

11 **A.** Correct. This is from -- directly from the call center.

12 MR. RUSSO: Okay. And you can put that one down.

13 I think that is all, Your Honor, I have on redirect.

14 THE COURT: I have a question or two. Holly, could
15 you put me back or can I -- the video back? I had taken myself
16 off. Thank you.

17 EXAMINATION

18 BY THE COURT:

19 **Q.** Your declaration is at Document 815-1 attached to the
20 State's response to the Coalition's motion. And I would be
21 most appreciative if you could provide some clarification about
22 the differences between the electors list and the supplemental
23 list that the Secretary of State's office and the counties are
24 providing each precinct after early voting and the version, on
25 the other hand, of the backup list that the plaintiffs in this

1 case are requesting to be delivered on the weekend that we
2 discussed.

3 **A.** Okay. I didn't catch the second part of the question,
4 Your Honor. I get the difference between the elector list and
5 the supplemental list.

6 What was the second part of the question?

7 **Q.** I understand you have got an electors list and then you
8 have a supplemental list. And I need to make sure I understand
9 what is in the supplemental list.

10 But in tandem -- you know, you have got those lists. But
11 what the plaintiffs are asking for is that the actual --
12 basically an up-to-date list that can be used for verifying
13 voters when they appear be provided to the polling places on
14 essentially the weekend before voting starts so that they can
15 not be spending time calling the office trying to verify voter
16 status, that they can resolve their status and they can also
17 potentially, if necessary, because of problems with any of the
18 machinery -- the failure and backup of lines that they can
19 issue emergency ballots and people won't just give up and go
20 away.

21 **A.** Okay. I'll try my best. I know I can handle the first
22 part, but I'll try my best on the second part. The electors
23 list is the list of all the registered voters in a county.

24 The list for the -- that is -- as I mentioned, that is
25 created early in the process, near the time of the voter

1 registration deadline.

2 What happens on the second Thursday before the election is
3 that CES pulls the list of -- the voter list for each county.
4 So if we are sticking in Fulton County, on the second Thursday
5 before election day, they would pull from our voter
6 registration system every registered voter in Fulton County.
7 And they would then put that on the Poll Pads for election day.
8 So you would have all the registered voters that are in the
9 database then.

10 The problem is that in some of the large counties they get
11 so many voter registration applications they are not always
12 done entering them into the system by that point. So the
13 supplemental list is everybody that is entered into the voter
14 registration system. Now, their application has been received
15 by the deadline. But that is everybody that gets entered into
16 the election net system between the original pull for the Poll
17 Pads and election day.

18 And so that is done on Saturday after the end of the
19 advance voting. So if a county has -- and the electors list is
20 really for a backup for safety. So what happens is when you
21 have got a Poll Pad, you have got everybody in that county that
22 was in the voter registration system as of the second Thursday
23 before. But if you were one of the last people to get entered
24 in, you are not going to be on the Poll Pad.

25 So if you come in to vote and they can't find you on the

1 Poll Pad, the first thing they should do is check the
2 supplemental list. Because if you were one of the last ones to
3 be entered, you are going to be on the supplemental list. They
4 mark you on the supplemental list, and they create a card for
5 you, and you vote on the BMD. So that is the difference
6 between the electors list and the supplemental list.

7 The electors list would be --

8 **Q.** When is the supplemental list provided? I'm sorry.

9 **A.** The supplemental list is -- again, the second Thursday
10 before the election, they pull the list of voters for the
11 county. The problem is that in some counties the voters keep
12 getting added to the voter registration system.

13 And if you -- you don't want to stop rendering -- stop
14 entering voters just because the data has been pulled. So what
15 you do is you -- you wait until that Saturday before or that
16 Friday and then you say, okay, give me everyone in the voter
17 registration system that we added since we did the main pull.
18 And you can't update them into the Poll Pads. So you create a
19 second list of them.

20 The smaller the supplemental list the better. Because
21 that means the smaller your supplemental the more voters that
22 are in the Poll Pads. The larger the supplemental list means
23 you were late getting voters entered into the voter
24 registration system.

25 **Q.** So according to your affidavit, which Ms. Cole has very

1 kindly pulled up for me, that supplemental list is generated in
2 eNet and you are expecting the county to print that if they
3 want to --

4 **A.** They have to. We basically order it in eNet, and then the
5 county can pull it and print it on that weekend before the
6 election.

7 **Q.** So once they print that, assuming that it is actually
8 accurate, is it your representation that basically -- that
9 between the voter's list that they have and this supplemental
10 list they have a complete list of everyone who is in their --
11 properly registered in the precinct?

12 **A.** Yes, ma'am.

13 **Q.** But what they don't have then is information as to whether
14 they have cast a ballot or not?

15 **A.** Correct.

16 **Q.** So why -- the plaintiffs have a provided their declaration
17 in the exhibits -- a number of different ones that indicate
18 that counties are using their basic list of voters, for
19 instance, the August 11 runoff had been run in June for the
20 June 9 primary.

21 So basically either they have a massive supplemental or
22 else they really -- if they don't end up -- they don't have
23 really an up-to-date voter registration list of voters.

24 Is there any reason that you can think of that the
25 county -- the State would be providing the counties or the

1 precincts with basically data voter registration information?

2 **A.** Well, it is -- they have the Poll Pad, which is the
3 complete list. And then they would have a new supplemental
4 list for the runoff. So on August 11, they would get a new
5 supplemental list. And they would have the Poll Pad that would
6 have the up-to-date list. You are saying we run a second --

7 **Q.** I see. For the August runoff, you wouldn't have run
8 anything extra? You would have just had the June -- whatever
9 it was as of June?

10 **A.** I believe that is correct.

11 **Q.** Were you present during the last witness from Fulton
12 County -- his testimony?

13 **A.** I saw most of it. There were some times where I had to
14 step away, but I saw most of his testimony.

15 **Q.** Do you recall -- I think you have attended almost every
16 hearing. Though I'm not positive of that. I have repeatedly
17 asked what -- in going back to December, why is it that we
18 still -- the State is reluctant to -- I realize it is a burden.
19 But it could -- especially as you are transitioning to an
20 entire new data system that may at minimum have kinks in it,
21 why is it you are not willing to provide the precincts and
22 counties with an up-to-date list of voters and whether --
23 basically whether they have cast votes?

24 **A.** Well, Your Honor, we do that. That is the ExpressPolls.
25 That is the Poll Pads.

1 Q. Right. I know it is the Poll Pad. But as I'm sure you
2 recognize, there were significant issues with the electronic
3 Poll Pads.

4 So basically what are you leaving -- basically voting
5 locations in Fulton County and other -- many other places, what
6 is the position you are putting them in if they have a
7 significant breakdown in the functionality of the Poll Pads?

8 A. Well, they do have a paper list.

9 Q. No. What they have is -- they have a paper list, and then
10 they can call you multiple times -- the office and stay on the
11 phone. But then people -- the longer the lines are the more
12 people are likely to leave. So I mean, I know you are familiar
13 with that phenomenon.

14 A. Yes, ma'am. And to clarify, they don't call our office.
15 They call each county office to find out if an absentee ballot
16 has been entered.

17 I'm not sure how logistically possible it is to do what
18 you are asking. If there was a way that it could be provided
19 and -- it would have to be some of the counties would have to
20 print out. If we could provide it digitally, it would have to
21 be something counties could print out. There is no way we
22 could print it on that Saturday before the election and get it
23 to the counties -- get it to 159 counties. That is
24 logistically impossible.

25 Q. But, Mr. Harvey, is it, in fact -- isn't it possible for

1 you to at least be able to provide that data and that report to
2 the counties so they could at least choose to run this and have
3 the option meaningfully of allowing people to use the emergency
4 ballots and move their lines quicker so people don't give up?

5 **A.** Your Honor, not being an expert on every phase of eNet, if
6 that is possible to create that report, I would have no
7 objection to making that available to the counties to do with
8 it what they wanted. I'm not 100 percent sure if that is a
9 report that is available.

10 **Q.** Who would know that?

11 **A.** Our systems manager. I could certainly get that through
12 our attorneys and get back to the Court probably within a day
13 or so.

14 **Q.** Because I think this is what I've been asking for for some
15 time and just basically have not gotten an answer for months
16 dating back to other hearings. But I think it would be
17 important to know.

18 **A.** Yes, ma'am. I'll get you that answer.

19 **Q.** Finally, on the -- thank you very much.

20 And on the emergency ballot, this is not a provisional
21 ballot, is it? When you do an emergency ballot and you have
22 been verified as a voter, then it is going to be scanned in
23 like any other ballot; is that correct?

24 **A.** That's correct. Although physically it is the same as a
25 provisional ballot. The difference is with provisional you put

1 it in an envelope and with an emergency you put it directly
2 into the scanner.

3 **Q.** All right. Very good. Thank you.

4 So the individual -- the individual voter leaves knowing
5 that he or she has actually cast a ballot?

6 **A.** Yes. They place it themselves in the scanner.

7 THE COURT: Right. Thank you.

8 MR. RUSSO: Your Honor, could I ask Mr. Harvey one
9 point of clarification?

10 THE COURT: Yes.

11 MR. RUSSO: I think it might clear up some of the
12 questions also.

13 REDIRECT EXAMINATION (Further)

14 BY MR. RUSSO:

15 **Q.** Mr. Harvey, when absentee ballots are coming in or going
16 into the counties, can you explain to us the process of the
17 county accepting the absentee ballot and then updating the
18 information in eNet, which is ultimately what is in the
19 electors list?

20 **A.** Every time the county receives an absentee ballot back in
21 from a voter, they have to make sure that it is -- the
22 signatures are present, the signature matches. And then they
23 enter it in eNet as whether it as accepted or rejected and the
24 date that it is accepted or rejected.

25 So if it is -- if the ballot comes back and the signature

1 is compared favorably and it is accepted, they would mark it as
2 an accepted ballot on this date and they would put the ballot
3 in a container to be scanned during either early scan or
4 election day.

5 If it was rejected, it would show that it was rejected for
6 this reason on a certain date and then the county would have to
7 provide a cure affidavit to contact the voter and let them know
8 how they could cure their absentee ballot.

9 The updating in eNet is what voters are able to see when
10 they check their -- if they go to MVP, for example, and check
11 the status of their ballot, if their ballot has been received
12 and accepted back by the county, they will see it on MVP. They
13 will only see it on MVP if the Court inputs it into eNet in a
14 timely manner.

15 **Q.** And absentee ballots, sir, are presumably coming in all
16 the way up through the date of the election; right?

17 **A.** Up until the close of polls. So they are coming into the
18 office -- usually the last -- most post offices arrange a
19 special run at about 6:00 or 7:00 to get to the counties.

20 **Q.** So if somebody -- a voter mails in an absentee ballot
21 before it is -- and they look on -- on MVP and they show that
22 the ballot has not been accepted, until that ballot is
23 accepted, the electors list or eNet will not show whether the
24 ballot has -- you couldn't update a paper pollbook or paper
25 electors list to show that somebody's absentee ballot had come

1 in unless it had actually been accepted by that point by the
2 time that it had been printed?

3 **A.** Right. It would only show accepted ballots that were
4 accepted in eNet. It wouldn't show the 500 that are still
5 waiting to be sorted.

6 MR. RUSSO: Okay. I don't know if that helps clear
7 up some of the timing issue of when paper ballots are coming in
8 versus what the paper pollbook or paper electors list shows,
9 Your Honor.

10 THE COURT: Well, obviously, you know, if you come in
11 if you want to vote and you ask for a ballot -- absentee ballot
12 and you don't have it, you get -- there is obviously
13 something -- a process that occurs at that time. And typically
14 you are supposed to bring -- as you all know very well, you are
15 supposed to bring back the ballot if you want to now vote. And
16 there would be a protocol for any precinct poll workers to say,
17 no, you still have a ballot out there. I can't do that.

18 But I'm really talking about right now in large part
19 the problem of a line and people who cannot -- particularly in
20 this era, not be able to be standing in a line with a lot of
21 people waiting to vote and having that as an impediment to
22 their casting a vote when there is, in fact, an emergency
23 process and when you, in fact, have a documented record of some
24 significant problems with the pollbooks. It just seems like a
25 reasonable way of thinking about something concrete to do.

1 I'm taking in all that you are saying. I'm just
2 asking about it so that I can actually have -- you know,
3 Mr. Harvey is head of elections. I realize he is not
4 Mr. Barnes. But I'm sure you will have other people.

5 I'll be asking -- I'm asking counsel. I have asked
6 counsel about this before. Basically I indicated, you know, in
7 our conversations before it was something I was going to be
8 asking about.

9 All right. Thank you very much, Mr. Harvey. I
10 appreciate your being here. Good luck on election day.

11 THE WITNESS: Thank you.

12 THE COURT: Anyone need a break for a few minutes?
13 Okay. We will take five minutes and resume. It is 2:53.

14 COURT REPORTER: How long did you say, Judge? I
15 couldn't hear you.

16 THE COURT: Five minutes. Is that sufficient?

17 COURT REPORTER: Sure.

18 **(A brief break was taken at 2:53 P.M.)**

19 THE COURT: I just wanted to finish up what I last
20 said, which is also that I do recognize that it is not
21 necessarily all the Poll Pads, that there were other document
22 issues relating to BMDs and this is a transitional period of
23 time. But the comment holds.

24 All right. Mr. Cobb, he is the State's witness?

25 MR. TYSON: Yes, Your Honor. We call Jack Cobb as

1 our next witness.

2 THE COURT: Great.

3 MR. TYSON: Do you want to swear Mr. Cobb?

4 THE COURT: Would you raise your right hand,
5 Mr. Cobb.

6 **(Witness sworn)**

7 THE COURT: And where are you located at this time,
8 Mr. Cobb?

9 THE WITNESS: I am in my office in Huntsville,
10 Alabama.

11 THE COURT: Thank you very much.

12 Whereupon,

13 JACK COBB,

14 after having been first duly sworn, testified as follows:

15 DIRECT EXAMINATION

16 BY MR. TYSON:

17 **Q.** Thank you, Mr. Cobb. Good to see you. Thank you for
18 joining us via Zoom.

19 Very briefly if you could summarize your experience and
20 what Pro V&V is.

21 **A.** I have been a software systems test analyst or engineer
22 for 14 years in the voting systems arena. I cofounded Pro V&V,
23 which is an accredited national institute and a standards and
24 technology accredited lab and a United States Election
25 Assistance Commission accredited VSTL or voting systems test

1 laboratory.

2 **Q.** Thank you. And what does Pro V&V do specifically with
3 election equipment?

4 **A.** We test electronic equipment to the voting -- Voluntary
5 Voting Systems guidelines and the VSS, which is the Voting
6 Systems Standards. We work for the -- under the EAC
7 supervision to test electronic voting equipment.

8 **Q.** And can you briefly summarize what the voluntary voting
9 system guidelines are?

10 **A.** They are a published document by the United States
11 Election Assistance Commission that contains roughly 1500
12 requirements. For a voting system to be certified by the
13 Election Assistance Commission, you have to pass those
14 standards.

15 **Q.** And I know there was some testimony earlier about VVSG 1.0
16 versus 1.1 versus 2.0.

17 Can you briefly explain what the differences in those
18 numbers refer to?

19 **A.** Yes. The version 1.0 is the 2005 standard. And the 1.1
20 were adopted when they got commissioners in, I believe, the
21 February 2015 time frame. And then the 2.0 is currently under
22 adoption. We're working on the test assertions to go along
23 with the requirements so that it can fully be adopted and can
24 be tested to.

25 **Q.** Are there a number of voting systems currently certified

1 under VVSG 1.1?

2 **A.** No, sir. There are none.

3 **Q.** So there is no hand-marked paper ballot system that is
4 certified under VVSG 1.1?

5 **A.** No.

6 **Q.** There has been some discussion earlier about the
7 difference in Dominion's 5.5 system and its 5.5-A system.

8 Have you heard that testimony?

9 **A.** Yes.

10 **Q.** And you talk in your declaration about something referred
11 to as a FIPS, I believe, F-I-P-S. Is that a difference in
12 those systems, or have you done more research on this issue?

13 **A.** No. I have done more research on this issue. The
14 difference in the 5.5 and 5.5-A is what is called the
15 Pennsylvania Rule for Straight Party Voting. And their system
16 had -- when they presented their system to the common laws of
17 Pennsylvania, it did not perform that correctly. And that is
18 the difference in 5.5 and 5.5-A.

19 **Q.** And is there any difference in a Dominion system that
20 involves a five series that involves a FIPS?

21 **A.** Yes. The 5.0-A that went through the EAC under my lab is
22 the one with the FIPS. And that is where the confusion came
23 in. I was trying -- I rushed through to get my declaration
24 out, and I did not do the research to ensure of what the exact
25 changes were. And when I heard Dr. Coomer talk, I went back

1 and looked it up just to make sure.

2 **Q.** Okay. And is there any difference between the 5.5-A and
3 the 5.5-A (GA) systems?

4 **A.** That report was designated as GA because the Election
5 Assistance Commission will not allow a state level report that
6 we performed specifically for states to go out before the
7 federal certified systems report goes out. So they make us put
8 a designation on it so they will know that that is just for
9 Georgia and it is not the stuff that the EAC is working on.

10 **Q.** And so is there a difference between those two systems, or
11 are they the same?

12 **A.** They are the same.

13 **Q.** Has Dominion's 5.5 or 5.5-A been the subject of security
14 testing?

15 **A.** Yes. I'm aware of two or three, one in the EAC world and
16 one in the Commonwealth of Pennsylvania.

17 **Q.** And did Pro V&V conduct any security testing of either 5.5
18 or 5.5-A?

19 **A.** We conducted 5.5 but not 5.5-A.

20 **Q.** And did a different voting system test lab perform
21 security testing on 5.5-A?

22 **A.** Yes. SLI Compliance did the 5.5-A.

23 **Q.** Now, you have read Dr. Halderman's criticism of you for
24 using the term encrypted for the QR codes; correct?

25 **A.** Correct.

1 Q. And can you explain to the Court your version of the
2 varying terminology here?

3 A. The words that I used were a direct quote from a document
4 that was provided by Dominion. Now, what the real technical
5 terms should mean is that they are authenticated and it is
6 encoded. I think Dr. Coomer talked about the bitmask and all
7 that stuff.

8 So there was no -- there is no algorithm which would be
9 encryption or cryptographic modules that encrypt the barcode or
10 the QR code. But the QR code is not in human readable format
11 because it is encoded.

12 Q. And you have also done testing on KNOWiNK Poll Pads; is
13 that correct?

14 A. Correct.

15 Q. Do you know if Poll Pads are used in a lot of the
16 jurisdictions across the country?

17 A. They are. And, specifically, the KNOWiNK Poll Pad, I
18 believe, is in over 20 states and Canada, I think.

19 Q. And there has been some testimony in this case that the
20 KNOWiNK Poll Pads can generate an unlimited number of voter
21 access cards.

22 Have you heard that testimony or read those declarations?

23 A. I read the declarations. I don't remember any testimony.
24 But, specifically, yes, they can create activation code cards
25 for a voter. If a voter doesn't vote and then says that is not

1 who I voted for, they can return that ballot to the poll
2 worker, the poll worker can spoil the ballot, they can receive
3 another card and go vote.

4 It is not that they can get multiple cards. The process
5 is they can't get multiple cards at the same time. But a voter
6 could end up having three or four and in I think some
7 jurisdictions limit it to you can spoil about three, five
8 times. It is jurisdiction-specific.

9 **Q.** So is it a usual setup to have the KNOWiNK Poll Pad able
10 to create multiple voter cards?

11 **A.** Yes.

12 MR. TYSON: All right. Your Honor, in the interest
13 of efficiency, that is all the questions I have for Mr. Cobb.
14 And I'm sure the plaintiffs will have some questions to ask.

15 MR. CROSS: Thank you, Your Honor.

16 CROSS-EXAMINATION

17 BY MR. CROSS:

18 **Q.** Hi, Mr. Cobb. I'm David Cross, and I represent the
19 Curling plaintiffs.

20 **A.** Good afternoon.

21 **Q.** Can you hear me okay?

22 **A.** Yes, sir.

23 **Q.** When were you retained by the State as a consultant for
24 the Georgia election system?

25 **A.** Can you be more specific? For this specific one or --

1 because I was retained under the old GEMS stuff as well.

2 **Q.** So when were you first retained?

3 **A.** I can't say for certain. I can give you an approximate
4 time frame of 2012.

5 **Q.** You and your firm had not performed any penetration or
6 security testing on Georgia's Dominion voting system; right?

7 **A.** We have not on the 5.5-A.

8 **Q.** Which is the system used in Georgia; correct?

9 **A.** Correct.

10 **Q.** And did you ever perform any penetration or security
11 testing on the prior GEMS system for Georgia?

12 **A.** No.

13 **Q.** No. Okay. Did you write your declarations yourself?

14 **A.** Yes.

15 **Q.** In your August 25th declaration, which we have marked as
16 Exhibit 28 -- and we can pull it up if you need it -- but you
17 write in that, in the case Donna Curling, et al. vs. Brad
18 Raffensperger, the plaintiffs assert claims that are simply not
19 true.

20 Did you write that?

21 **A.** Yes.

22 **Q.** So let's talk through those. You identify in that
23 declaration specific claims from Dr. Halderman which you say
24 were not accurate. Let's turn to the first one.

25 The first one you identified -- and this is Paragraph 7 of

1 your original declaration -- is that the voting system software
2 can be altered in a way that cannot be detected, that the claim
3 from Dr. Halderman you said was false.

4 Do you remember that?

5 **A.** Yes. Can I get the document up --

6 **Q.** Sure.

7 **A.** -- just for clarification?

8 MR. CROSS: Ms. Cole, it is Exhibit 28. We're at
9 Paragraph 7.

10 LAW CLERK COLE: Do you know what page that is on?

11 MR. TYSON: Page 5, Ms. Cole.

12 MR. CROSS: Thank you.

13 THE COURT: This is document -- would you cite the
14 document number again. I'm sorry.

15 MR. CROSS: It is Exhibit Number 28. It was filed on
16 the docket as 821-6.

17 THE COURT: Thank you.

18 **Q. (BY MR. CROSS)** So, Mr. Cobb, if you look at Paragraph 7,
19 you see in the second sentence where it says, I have reviewed
20 the declaration of Alex Halderman.

21 Do you see that?

22 **A.** Yes.

23 **Q.** And you say, which claims that the voting system software
24 can be altered in a way that cannot be detected. Right?

25 **A.** Correct.

1 Q. And that is one of the claims that you say was simply not
2 true; right?

3 A. Correct.

4 Q. And your response to that, as you go on, is to say, the
5 voting system actually has a built-in feature that will
6 generate a SHA-256 hash value at any point before and during
7 voting to allow for easy checks to determine if it matches with
8 Georgia's version.

9 A. Correct.

10 Q. Do you see that?

11 A. Yes, sir.

12 Q. So you understand that both Dr. Halderman and Mr. Liu have
13 explained that malware that gets into the system -- it gets
14 into the BMDs and the other equipment can trick the system so
15 that it generates whatever hash value it needs to conceal the
16 fact that there is malware? You understand that; right?

17 A. Well, I understand that that is their claim. The
18 specifics of why I made my claim the way it is is because there
19 is a single APK file that resides on the device -- just one.
20 And it gets hashed when you push this icon.

21 So the other codes, the other applications, everything
22 else that is running, a malware, for instance, it can't
23 generate that code.

24 Q. I'm sorry. Mr. Cobb, is it your testimony that the
25 Georgia BMD system if you ran this SHA-256 test there is no

1 malware that could trick that test?

2 **A.** That is not my testimony, no.

3 **Q.** Okay. I'm sorry. What were you saying then? I
4 misunderstood.

5 **A.** On a technical level, the software is an APK file, a
6 single file. It is produced with -- it has a hash value that
7 can be produced for the APK file. If you alter that APK file,
8 the SHA-256 will change.

9 **Q.** But the malware --

10 **A.** I'm talking about malware or anything else on the system.
11 The specific software of the voting system, which would be the
12 APK. If the malware generated a different APK, it is going to
13 generate a different hash value.

14 **Q.** Right. So the APK generates the hash value; right?

15 **A.** The application itself has a built-in ability to hash
16 itself.

17 **Q.** Right. And malware can defeat that? We're agreed on
18 that? That is doable; right?

19 **A.** I'm not aware of that.

20 **Q.** You have not tested for that, have you, sir?

21 **A.** No.

22 **Q.** In fact, in your supplemental declaration where you
23 respond to Dr. Halderman and Mr. Liu, you don't talk about hash
24 values again, do you, sir? You don't mention hash values?

25 **A.** I was responding to their response. No, I didn't.

1 Q. Now, the next claim that you said from plaintiffs and
2 Dr. Halderman was simply not true --

3 MR. CROSS: If you go to Paragraph 10. If we can get
4 Exhibit 28, again, Ms. Cole -- it is Paragraph 10, which I
5 think it is going to be the next page or close.

6 Q. (BY MR. CROSS) So here you say in Paragraph 10 the next
7 claim that we're addressing, for example, the declaration --
8 this is Dr. Halderman's declaration you are referring to --
9 also stated that attackers could potentially infect Georgia's
10 BMDs with malware in several ways, including spreading it from
11 the election management system. In this system, the election
12 files, including the QR codes, are digitally signed and
13 encrypted.

14 Do you see that?

15 A. Yes.

16 Q. And you go on to say that Dr. Halderman is wrong about
17 this attack in Georgia because -- these are your words -- if a
18 QR code was somehow manipulated on the BMD, which I have never
19 seen occur in any context using the Dominion system, the
20 digital signature would also be altered and would not be
21 accepted by the scanner.

22 Do you see that?

23 A. Yes.

24 Q. So we're all agreed that the QR codes are not encrypted?

25 A. Agreed.

1 Q. And the statement that I just read about the QR code if
2 the QR code was somehow manipulated and you go on the digital
3 signature would also be altered, it would not be accepted by
4 the scanner -- you know that statement is not correct; right?

5 A. Can you repeat -- can you rephrase that?

6 Q. When you say that if the QR code was somehow manipulated
7 the digital signature would also be altered and it would not be
8 accepted by the scanner, do you stand by that?

9 A. In the -- in the 5.5 system, we tried altering the QR
10 code, not 5.5-A. But in 5.5.

11 Q. So you haven't even tested this on the system in Georgia?

12 A. No.

13 Q. Now, you are aware that Dr. Halderman has succeeded at
14 doing this with election equipment used in Georgia altering the
15 QR code and having it scanned and tabulated?

16 **(Unintelligible cross-talk)**

17 MR. TYSON: -- and, Your Honor, characterizing
18 testimony that is from a confidential source. We have not --
19 we have been over this. This is subject to the protective
20 order.

21 MR. CROSS: This is --

22 THE COURT: Strike that from the record.

23 Q. **(BY MR. CROSS)** Let's turn to the next claim. You say
24 that Dr. Halderman if you turn to -- I'm sorry. If we can go
25 to Paragraph 12. Here we are.

1 You write that another erroneous claim in Dr. Halderman's
2 declaration that focuses on paper ballots is hand-marked paper
3 ballots are already used in Georgia for absentee voting and so
4 they are prepared and printed for every ballot style in every
5 election.

6 Do you see that?

7 **A.** Yes, sir.

8 **Q.** But you understand that Georgia is required to prepare and
9 print every ballot style in every election for marking by hand
10 as absentee ballots or emergency ballots; right?

11 **A.** I think I heard testimony that they print ten percent,
12 yes.

13 **Q.** And so Dr. Halderman's statement is accurate; right?

14 **A.** I said -- can you go -- sure, they print every ballot
15 style.

16 **Q.** You mention that election printers in the U.S. are
17 backlogged. But you don't identify any printer specific
18 company that is backlogged, do you, sir?

19 **A.** No.

20 **Q.** And you don't indicate that you have spoken to any printer
21 about their ability to handle hand-marked paper ballots in a
22 large volume in Georgia; right, sir?

23 **A.** No.

24 **Q.** I'm sorry. Did you say no?

25 **A.** I said no.

1 Q. Thank you.

2 Let's look at your supplemental declaration, which is
3 Exhibit 29, Ms. Cole. If we can go to Paragraph 13.

4 LAW CLERK COLE: Do you know what page that is on?

5 MR. CROSS: Yeah. Sorry. I should have used page
6 numbers. Page --

7 MR. TYSON: Page 4.

8 MR. CROSS: Yeah. It is Page 5 of the PDF, Page 4 of
9 the declaration. Thanks, Bryan.

10 Q. (BY MR. CROSS) Here you wrote, regarding QR code
11 security, Mr. Liu claims -- I guess that is a typo in the
12 paragraph -- but you say that malware running on a BMD will
13 have full access to the necessary material to generate a
14 fraudulent QR code.

15 Do you see that?

16 A. Uh-huh (affirmative).

17 Q. Yes?

18 A. Yes.

19 Q. Is it true -- do I understand correctly that once the BMD
20 in Georgia is used in an election, once it is operating in an
21 election, at that point there is no dispute that it will have
22 all the keys it needs to generate a fraudulent QR code,
23 assuming that that is possible; right?

24 A. Can you rephrase that?

25 Q. Right. So we're talking about a situation where a BMD is

1 in use in an election in Georgia; right?

2 **A.** Yes.

3 **Q.** So at that point for it to be used, that means that the
4 election workers had to load the keys to it that you are
5 talking about in Paragraphs 13 and 14 so that it can function;
6 right?

7 **A.** They are there, yes.

8 **Q.** They are there on the BMD; right?

9 **A.** Yes. They are wrapped up in the APK.

10 **Q.** Okay. So at the point that an election is ongoing,
11 whatever keys would be needed for malware to generate a fake QR
12 code is sitting on the BMD; right?

13 MR. TYSON: Your Honor, I'll object. This is
14 assuming facts that I don't think are in evidence anywhere. I
15 don't know that there's a foundation for malware that can
16 create a fraudulent QR code.

17 MR. CROSS: Well, because I'm not allowed to mention
18 it. I mean, that is the difficulty here. We all know what --

19 THE COURT: Okay. Just -- you can pursue the
20 question.

21 MR. CROSS: Thank you, Your Honor.

22 **Q.** **(BY MR. CROSS)** Did you understand --

23 THE COURT: The witness has tested this -- the
24 equipment, is familiar with the equipment, and represents he
25 is. And certainly that is the representation of the State. I

1 think it is a fair question.

2 **Q. (BY MR. CROSS)** Do you need the question again, Mr. Cobb?

3 **A.** Yes, I do, please.

4 **Q.** Okay. So at the time when the BMD in Georgia is in use,
5 it is in an election, at that point it has whatever keys would
6 be needed loaded on it to generate a fake QR code?

7 **A.** Yeah. The keys would be on the device.

8 MR. CROSS: Ms. Cole, if we could go to -- let me get
9 you a page number -- Page 7 still in Exhibit 29. I'm sorry.
10 Go to Page 8. My apologies. I was looking at the wrong
11 pagination. Thank you.

12 **Q. (BY MR. CROSS)** So if you look at Paragraph 20 here,
13 Mr. Cobb, here we're talking about whether the QR codes are
14 encrypted or encoded.

15 Do you see that?

16 **A.** Yes, sir.

17 **Q.** And you explain here that your earlier statements that the
18 QR codes have digital signing and encrypting come directly from
19 a document that you obtained from Dominion that is an overview
20 on the system that we're talking about here; right?

21 **A.** Correct.

22 **Q.** And you quoted here to say, the encoded data is encrypted
23 and signed in order to prevent tampering, abuser selection, and
24 eliminate possibility of error during ballot scanning process.

25 Do you see that?

1 **A.** Yes.

2 **Q.** Do I understand correctly that for your representations to
3 the Court in your earlier declaration that the QR codes were
4 encrypted you were relying on information from Dominion?

5 **A.** Yes, sir. That document.

6 **Q.** So in all of the testing that you have done with this
7 system, all the time you spent with it, you never figured out
8 on your own that the QR code was not encrypted?

9 **A.** I don't do the security testing specifically. Jack Cobb
10 doesn't do the security testing specifically. This specific
11 one would have been done by Rebecca Santos, and she is our
12 security expert -- was our security expert at that time. She
13 had -- she is no longer with us. So I didn't have her to go
14 ask.

15 **Q.** Just so we're clear, I mean, you made a big point in the
16 sworn declaration to the Court about encryption. But the only
17 thing you were relying on for that was this overview from
18 Dominion rather than your own testing; right?

19 **A.** Yes.

20 THE COURT: Can I get some clarification? Was
21 Ms. Santos with you at that time and she did testing or --

22 THE WITNESS: Yes, ma'am.

23 THE COURT: And have you reached out to Ms. Santos?

24 THE WITNESS: No.

25 THE COURT: No. And when did she leave?

1 THE WITNESS: November 2018.

2 **Q.** (BY MR. CROSS) So she left almost two years before you
3 submitted your declaration to the Court saying that the QR code
4 was encrypted; right?

5 **A.** Yes.

6 **Q.** And we certainly all agree that there is a fundamental
7 computer science and security distinction between coding data
8 and encrypting data; right?

9 **A.** Yes.

10 **Q.** Are you aware that the QR codes on -- from the Dominion
11 system -- the BMD system can be decoded with a simple iPhone
12 app so you can see what the voter selections are?

13 **A.** I am not aware of that.

14 **Q.** You have never tried that? That is not something you
15 tested?

16 **A.** Specifically, I have not.

17 **Q.** In your testing, did you ever take a test ballot,
18 photocopy it on regular paper, run it through a scanner, and
19 see if it would tabulate?

20 **A.** Yes.

21 **Q.** Did it work?

22 **A.** Yes.

23 **Q.** Meaning did it tabulate?

24 **A.** Yes.

25 **Q.** Okay. So you are aware that that happens with the system

1 that is used in Georgia; right?

2 **A.** Yes.

3 MR. CROSS: Those are all the questions I have at
4 this time, Your Honor.

5 MR. MCGUIRE: Your Honor, may I?

6 THE COURT: Yes.

7 CROSS-EXAMINATION

8 BY MR. MCGUIRE:

9 **Q.** Mr. Cobb, are you aware that the EAC certified Democracy
10 Suite 5.5-A on January 30, 2019?

11 **A.** January? No. I think they certified it -- I'm not aware
12 of that.

13 **Q.** If I showed you a certificate from the EAC's website,
14 would that help resolve your uncertainty?

15 **A.** Yes.

16 **Q.** Okay. I will see if we can do that. I would like to pull
17 up in the meantime PX 54.

18 Now, Mr. Cobb, do you recognize PX 54?

19 **A.** Yes.

20 **Q.** What is that?

21 **A.** That is the test report produced by my company for the
22 State of Georgia.

23 MR. MCGUIRE: Okay. Your Honor, I would like to move
24 this into evidence, please.

25 MR. TYSON: Your Honor, we obviously don't have an

1 objection.

2 THE COURT: Admitted.

3 **Q. (BY MR. McGUIRE)** Thank you. So if you could scroll down
4 just a little bit, there is a date on that report.

5 Do you see -- Mr. Cobb, do you see the cover page, the
6 date there, November 26, 2019?

7 **A.** Yes.

8 **Q.** Is that the date when you conducted -- when Pro V&V signed
9 off on its report?

10 **A.** That is when we issued the report.

11 **Q.** Okay. Now, you told Mr. Tyson that version 5.5-A (GA)
12 came before version 5.5-A; correct?

13 **A.** There is not a different system. It is just this report
14 came out before 5.5-A was certified by the Election Assistance
15 Commission.

16 **Q.** So that would be true -- that wouldn't be true if the EAC
17 certified 5.5-A in January of 2019, would it?

18 **A.** No.

19 **Q.** I would like to go to the second page.

20 THE COURT: I'm sorry. Where is it you are saying --
21 in January of 2019, what was certified? 5.5? Is that what you
22 are asking, Mr. McGuire?

23 MR. McGUIRE: Well, I'm representing to him since he
24 is not aware that in January of 2019 5.5-A was certified by the
25 EAC.

1 THE COURT: What is this now that we have in front of
2 us on the screen?

3 MR. McGUIRE: This is Mr. Cobb's report on 5.5-A
4 (GA).

5 THE COURT: Okay.

6 THE WITNESS: Correct. I think I can clear this up.
7 5.5-A was certified by the EAC. Then 5.5-A -- or hold on. We
8 have got to go back. 5.5 was certified. Then we had to make a
9 change for Pennsylvania, and it went to 5.5-A. Then 5.5-A had
10 an ECO that came out in -- I forgot the exact date -- but in
11 the August time frame. And then we had to go back and do the
12 Georgia testing over on the new stuff with the new ECO in it.
13 And that is the report we put out.

14 And then the EAC was still going through their ECO
15 program. They didn't accept the ECO, I don't think, until
16 April of 2020. So there is a chronological order to all of
17 this.

18 **Q. (BY MR. McGUIRE)** Right. So what I'm trying to get at is:
19 The version that was certified as 5.5-A, which was certified in
20 January of 2019, was changed to produce 5.5-A (GA); correct?

21 **A.** No. It was changed to produce 5.5-A with an ECO applied
22 to it. But we had to go back and do this testing for Georgia
23 because the ECO had changed the system.

24 MR. McGUIRE: Let me turn to Page 4 -- Holly, if you
25 could pull up Page 4 of this PX 54, please. If there is any

1 way you can widen it. I'm looking at that Section 2.0 testing
2 overview.

3 **Q. (BY MR. MCGUIRE)** Mr. Cobb, if you can see that
4 Section 2.0 testing overview, that text paragraph there says,
5 the evaluation of D Suite 5.5-A (GA) was designed to verify
6 that certain features and applications which have been modified
7 from the certified baseline system conform to the applicable
8 EAC VVSG 1.0 requirements.

9 Did I read that correct?

10 **A.** You did.

11 **Q.** Okay. So what you are saying then is that you were
12 looking at a change in -- when you did this report in November
13 of 2019 from what had been certified previously but because
14 your change was later -- because the engineering change order
15 that you were reviewing and testing was later accepted by the
16 EAC that therefore this wasn't a change from your original
17 certified system?

18 **A.** It wasn't changed from the original certified system. It
19 was listing a new scanner.

20 **Q.** So I guess that is what I'm getting at. It was a change
21 from the original system; correct?

22 **A.** It added a new scanner.

23 **Q.** Okay. It added a scanner, but it was a change to the
24 system; right?

25 **A.** Yes.

1 Q. And any change to a certified voting system has to itself
2 be certified before it can be legally used; right?

3 A. If it is a change that is deemed de minimis, it doesn't
4 have to be recertified. It remains certified.

5 Q. And you are saying that this change was found to be de
6 minimis and was approved after you wrote your report?

7 A. No. This change was originally submitted to us in August,
8 and we rejected it. It then was resubmitted, and we had to do
9 hardware testing on the new scanner to make sure that it would
10 pass temperature power variation tests.

11 Q. Then when you issued this report, the system passed?

12 A. We submitted it to the EAC, and the EAC approved the ECO.

13 Q. Okay. Do you know when that happened?

14 A. It was submitted on April -- April 8, 2020, and approved
15 on April 13, 2020.

16 Q. So when you were using this -- when Georgia was using this
17 system before April -- well, I guess that is the question. Was
18 Georgia using this system before the EAC approved the change in
19 April?

20 MR. TYSON: Your Honor, I object. I don't know that
21 there is foundation for Mr. Cobb's knowledge of what Georgia
22 was using when. We went over this with Dr. Coomer. Mr. Cobb
23 explained this in his declaration of the timing here. I don't
24 understand why we are still on this system EAC certified.

25 MR. MCGUIRE: Your Honor, the reason we are on it, if

1 I may respond, is because the State's biggest defense of this
2 system is that it has been thoroughly tested and certified. So
3 it is worth exploring if that is actually true.

4 MR. TYSON: Everyone says it is. I don't understand
5 why we are going down the line of questioning.

6 THE COURT: Well, frankly, let me just say, I
7 certainly didn't understand all of the wrinkles, Mr. Tyson.
8 But at the same time, Mr. McGuire, it was -- we ended up having
9 some trial runs that the State ran in the fall of 2019 with the
10 equipment. And I guess some people voted early in February --
11 I think we can take note of that -- in the presidential primary
12 and then the entire election got moved until June.

13 So I think that the sequence of elections is clear.
14 It is not something that Mr. Cobb necessarily has any knowledge
15 about. And I understand that -- but just for purposes of all
16 our just framing this, which I'm sure the State knows this
17 inside out.

18 MR. TYSON: Yes, Your Honor. And I guess the thing
19 I'm confused about is it is about one scanner. So we don't
20 have any testimony that any non-EAC approved scanner was being
21 used at any point. Again, I'm mystified. We are using an EAC
22 approved system. The only change is one scanner.

23 THE COURT: Well, I don't know what you were using in
24 the fall. You know, I don't know when it was swapped out or
25 anything else like that. So I allowed him to pursue this, and

1 we're going to be able to again.

2 But I'm not sure that knowledge that Mr. Cobb has
3 about what was used or not is useful at this point. But
4 understanding the sequence of what he tested and what was
5 rejected certainly is of relevance. So -- but I would ask
6 Mr. McGuire to bring this to a conclusion.

7 MR. MCGUIRE: I will. I will wrap it up.

8 **Q. (BY MR. MCGUIRE)** Mr. Cobb, the reason why we test any
9 changes is because any change to a certified system introduces
10 the possibility of a vulnerability that is new; right?

11 **A.** Or defect.

12 **Q.** And so that is why we have testing every time there is a
13 modification of software or hardware?

14 **A.** Correct.

15 **Q.** Okay. Pro V&V paid for this study -- or Pro V&V was paid
16 by Dominion for this study; correct?

17 **A.** No. I think we were paid by Georgia. I would have to
18 double-check that.

19 **Q.** Do you view Georgia as your customer, or do you view the
20 voting system company as your customer?

21 **A.** Georgia.

22 MR. MCGUIRE: Okay. Your Honor, we have no further
23 questions.

24 MR. TYSON: Your Honor, I have one brief follow-up
25 question.

REDIRECT EXAMINATION

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BY MR. TYSON:

Q. Mr. Cobb, Mr. Cross asked you about altering the digital signature that you had (electronic interference) that you conducted on Version 5.5. Do you recall that testimony?

A. Not really. But --

Q. Mr. Cross is asking you about the detection of a digital signature being altered, and you had -- had you tested that version 5.5? If you don't recall, that is fine.

A. Personally I have not. Back to -- I have security experts on staff. Currently I have a certified ethical hacker. They do the security testing. I don't have credentials to get away with doing security testing.

Q. And your certified ethical hacker on your staff right now, who is that and what are their qualifications?

A. His name is Mancy Hammond, and that is a certificate. I mean, that is a professional certification that he is a certified ethical hacker.

MR. TYSON: I don't have any further questions then, Your Honor. Thank you.

MR. CROSS: Your Honor, I guess a question. Mr. Tyson just asked him about the very thing that he said I was not allowed to ask him about. So can I now ask him?

I mean, what I was asking him was about the ability to alter what he says is a digital signature QR code. And

1 Mr. Tyson said I'm not allowed to ask him about what we know
2 about that.

3 MR. TYSON: No, Your Honor.

4 MR. CROSS: It is really unfair for Mr. Tyson to ask
5 a follow-up question suggesting that that is not possible when
6 we know a particular reality. So I should be able to ask my
7 follow-up question having opened the door.

8 THE COURT: Well, the only thing is --

9 MR. TYSON: Your Honor --

10 THE COURT: -- Mr. Cobb has indicated he does not
11 have any expertise in the security area so -- and that he
12 basically delegates it to somebody else on staff, which is a
13 changing person from what I can tell.

14 So I mean, I don't know that I could give weight
15 to -- I mean, I don't -- his answer to Mr. Tyson or to anyone
16 at this point as to security issues if that is what you are
17 asking about.

18 Is there something --

19 MR. CROSS: I was just going -- I wanted to know if
20 he is aware of what has been done and how that affects his
21 conclusions. But --

22 THE COURT: Well, I think he's not an expert on
23 security issues, and he has indicated he is not doing
24 penetration testing. So I really feel like this is rhetorical.

25 MR. CROSS: I understand. Thank you, Your Honor.

1 THE COURT: I'm just trying -- what I'm trying to
2 understand, frankly, is did -- Ms. Santos left in November of
3 2018. And I'm just trying to -- was she immediately -- and she
4 was the one who did the security testing or penetration
5 testing?

6 THE WITNESS: She did penetration testing for the
7 Commonwealth of Pennsylvania.

8 THE COURT: Okay. That was on 5.5?

9 THE WITNESS: A.

10 THE COURT: A?

11 THE WITNESS: Yeah.

12 THE COURT: That had to be recertified.

13 THE WITNESS: Correct. Their expert was SLI
14 Compliance. The Commonwealth of Pennsylvania uses them. So
15 Dominion chose to take 5.5-A to them for the EAC stuff because
16 they could knock out both the Commonwealth of Pennsylvania and
17 the EAC all at one time.

18 THE COURT: And they did that before Ms. Santos left
19 in November of 2018?

20 THE WITNESS: Yes. They went to SLI Compliance
21 before that.

22 THE COURT: All right. I don't have the documents in
23 front of me. But that is about the certification. That is
24 about the sequences. That is helpful.

25 All right. Is this witness excused?

1 MR. CROSS: Yes, for us, Your Honor.

2 MR. McGUIRE: For us as well.

3 THE COURT: Sir, you are excused. Thank you very
4 much for your testimony.

5 MR. MILLER: Your Honor, can you hear me okay?

6 THE COURT: Yes.

7 MR. MILLER: I believe our next witness will be
8 Dr. Ben Adida. I believe he is on the chat. There he is. I
9 believe Dr. Adida is on mute.

10 THE WITNESS: I have been unmuted.

11 MR. MILLER: Your Honor, are you ready for me to
12 proceed?

13 THE COURT: Yes.

14 MR. MILLER: Would Your Honor prefer to swear in the
15 witness?

16 THE COURT: I will. I'm sorry. I'm looking at a
17 document at the same time. And that was unfortunate.

18 Good afternoon. Raise your right hand.

19 **(Witness sworn)**

20 THE COURT: All right. And state your name and your
21 location.

22 THE WITNESS: My name is Ben Adida, and I am located
23 in Redwood City, California.

24 Whereupon,

25 BENJAMIN ADIDA, PH.D.,

1 after having been first duly sworn, testified as follows:

2 DIRECT EXAMINATION

3 BY MR. MILLER:

4 **Q.** Dr. Adida, thank you for joining us this afternoon. First
5 of all, I have got to say congratulations on your recent
6 recognition with Wired magazine yesterday.

7 MR. MILLER: If I could ask Ms. Cole to pull up what
8 was submitted as State Defendants' Exhibit 5 and filed at
9 Docket 889-1.

10 THE WITNESS: Yes.

11 MR. MILLER: Thank you, Ms. Cole. Could you scroll
12 to Page 13 of that document.

13 **Q. (BY MR. MILLER)** Dr. Adida, have you seen this before?

14 **A.** I have, yes.

15 **Q.** And do you recognize this to be the Wired article?

16 **A.** I have, yes. It has been sent to me by my parents. They
17 like it too.

18 **Q.** I'm sure they are quite proud.

19 And, Dr. Adida, I'm going to show you just a couple of
20 other additional exhibits regarding your background.

21 MR. MILLER: Ms. Cole, would you mind pulling up
22 State Defendants' Exhibit 6 and scrolling to the next page.

23 **Q. (BY MR. MILLER)** Dr. Adida, do you recognize this
24 document?

25 **A.** Yes. This is my web page.

1 Q. And this is your bio here; is that right?

2 A. Yeah. That is my bio on my web page.

3 MR. MILLER: And, Ms. Cole, if you wouldn't mind
4 pulling up State Defendants' Hearing Exhibit 7 and if you
5 wouldn't mind scrolling to the next page.

6 Q. (BY MR. MILLER) Dr. Adida, do you recognize this
7 document?

8 A. This document looks like a download of my LinkedIn
9 profile, I think. That is what it looks like, yeah.

10 Q. And is this a true and accurate copy of your LinkedIn
11 profile?

12 A. Yes. It does look like an accurate representation of my
13 LinkedIn profile.

14 MR. MILLER: And, Ms. Cole, one last exhibit, Hearing
15 Exhibit 8 if you don't mind. Thank you. And, Ms. Cole, if you
16 could scroll to the second page there.

17 Q. (BY MR. MILLER) And, Dr. Adida, do you recognize this
18 document?

19 A. That looks like one of the pages of my web page that lists
20 the talks that I have given. Although I apologize that I have
21 not kept that page up to date. So I have given a number of
22 talks since 2011 that are not listed here. But that is the
23 page on my web page.

24 Q. And, of course, as I understand it, you may not have a CV
25 ready to fire in a quick time period; is that accurate?

1 **A.** Yeah. I'm lucky enough that I have not had to do a job
2 search since 2015. And so I have not kept my CV fully up to
3 date. But I'm happy to proceed to any element that may not be
4 updated in there, of course.

5 MR. MILLER: And, Your Honor, at this time I would
6 like to move to admit those Exhibits 5, 6, 7, and 8.

7 THE COURT: Any objection?

8 MR. SPARKS: No objection, Your Honor.

9 THE COURT: They are admitted.

10 THE WITNESS: I want to make sure that you are
11 hearing me because I'm not seeing the Zoom box come over my
12 face when I speak. But you are hearing me okay?

13 THE COURT: Fine.

14 I'm just wishing we are in the mountains where you
15 are shown to be. I don't think you are. But I hope the fires
16 are not affecting you.

17 THE WITNESS: They are. But we are privileged enough
18 to be okay. Thank you -- thank you, Your Honor.

19 **Q. (BY MR. MILLER)** And, Dr. Adida, we just talked about a
20 handful of those kind of biographical pieces. How about
21 publications? Have you published any kind of academic articles
22 or --

23 **A.** Yeah. I was -- I have a doctorate in computer science
24 from MIT. And as part of that work and as part of my
25 postdoctoral work, I have a number of publications in computer

1 science, specifically a number in election security but also
2 publications in security and privacy of health data and web
3 security and a handful of other topics that I have had the
4 privilege of working on.

5 **Q.** And, Dr. Adida, could you describe for the Court your
6 current employment and work.

7 **A.** Yeah. I am the cofounder and executive director of
8 VotingWorks. VotingWorks is a nonpartisan nonprofit. We're a
9 501(c)(3). And our mission is to build trust in elections
10 through secure, affordable, and transparent voting equipment
11 and technology.

12 **Q.** And, Dr. Adida, could you -- I know you mentioned
13 previously your Ph.D. from MIT.

14 And in terms of your other educational background, do you
15 hold any other degrees?

16 **A.** Sure. I have a bachelor's, master's, and Ph.D. from MIT
17 in computer science. And I held a postdoctoral fellowship
18 position at Harvard University also focusing on election
19 security. Yeah. That would be it.

20 **MR. SPARKS:** Your Honor, I don't mean to interrupt.
21 But the Curling plaintiffs are willing to stipulate that
22 Dr. Adida is an expert in computer science in the interest of
23 time.

24 **THE COURT:** Thank you.

25 **MR. MILLER:** If you don't mind, while we're

1 discussing stipulations, I think to the extent of the expert
2 testimony here regarding computer science, risk-limiting
3 audits, and RLA implementation, Mr. Sparks, do you guys have an
4 objection to those categories?

5 MR. SPARKS: I'm sorry. I need you to separate them
6 out, Mr. Miller. I couldn't quite hear you.

7 MR. MILLER: Computer science generally,
8 risk-limiting audits, and risk-limiting audit implementation.

9 MR. SPARKS: I believe we can stipulate to
10 risk-limiting audit implementation. Curling plaintiffs would
11 object to risk-limiting audits generally as an area of
12 expertise.

13 So, again, in the interest of time, we're not willing
14 to hold up questioning or ask for another set of proffer.

15 MR. MILLER: I guess to that extent, Your Honor, I
16 would just request some direction from the Court as to the -- I
17 guess the risk-limiting audit issue that I believe the
18 plaintiffs aren't ready to stipulate to.

19 I realize we want to move efficiently here. But I
20 don't want to waste time, but I also don't want to prejudice my
21 client by moving beyond.

22 THE COURT: Mr. Sparks, you want to identify what
23 your particular concern is so that we can just zone in on it?

24 MR. SPARKS: Yes, Your Honor. With regard to
25 risk-limiting audits generally, I understand -- and perhaps

1 this will come out in testimony -- I understand that
2 VotingWorks uses a software -- I believe it is called Arlo.
3 And that software is expressly benchmarked against the work of
4 other experts that are risk-limiting audits, specifically
5 Dr. Stark. And so without learning more about how exactly that
6 software would be composed and put together and developed, I
7 think it is a bit hard to say that in the entire field of
8 risk-limiting audits in total based on what has been proffered
9 and what we have seen that we could waive that objection.

10 THE COURT: Why don't we proceed this way since
11 Mr. Sparks was willing to proceed, Mr. Miller. Why don't you
12 bear that in mind as you are asking actual questions of
13 Dr. Adida. And if it needs to be pursued some more at the
14 conclusion of his examination -- it is going to probably be
15 taken care of one way or the other. Or if it is not, you can
16 be given an opportunity to lay a foundation. I would rather
17 just simply -- it may be addressed in due time during the
18 course of the examination.

19 MR. MILLER: I understand, Your Honor. And that is
20 suitable to us.

21 THE COURT: All right.

22 **Q. (BY MR. MILLER)** Dr. Adida, you discussed VotingWorks'
23 role and kind of the concept of what it is just a minute ago.
24 Could you tell me a bit more in terms of how you assist
25 jurisdictions, I believe you referred to it as.

1 **A.** Broadly speaking, so there are two main things that we do
2 at VotingWorks. One is we develop voting equipment for voters
3 to cast ballots and for those ballots to be tabulated. And we
4 do that so far in a very focused way in only a small number of
5 jurisdictions around the country.

6 And most of our activity is in helping states and counties
7 carry out risk-limiting audits, both pilots and actual legally
8 binding risk-limiting audits.

9 **Q.** Thank you. And, Dr. Adida, can you describe for us what a
10 risk-limiting audit is generally as you are referring to?

11 **A.** Absolutely. I think the right context for this is we have
12 had over the last 20 years in this country a really very
13 positive movement towards in some cases (electronic
14 interference) paper ballots in elections, so ballots that
15 voters look at, verify, and cast to make sure that their intent
16 is properly recorded on paper.

17 On the flip side, those ballots -- those paper ballots,
18 they get scanned by scanners which are computers. And those
19 computers give the results of the election.

20 And the second most important thing that we can do for
21 election security after paper ballots is to audit how those
22 scanners work to make sure that those scanners are properly
23 tabulating the ballots that they are scanning.

24 And that is exactly the point of the risk-limiting audit
25 is a kind of audit on the scanners that is very well specified

1 in terms of its physical power and thus can do -- can
2 effectively limit risk as its name implies if the scanners
3 declare it the wrong way.

4 **Q.** Okay. And, Dr. Adida, in that context, is RLA applicable
5 to elections conducted on both BMDs and hand-marked paper
6 ballots?

7 **A.** So a risk-limiting audit is applicable -- is meant to
8 audit the process of tabulating paper ballots. So if those
9 paper ballots can be verified by the voter, then the RLA is
10 applicable to tabulating those ballots, whether they are
11 hand-marked or whether they are marked by a machine as long as
12 the voter does get a chance to handle and verify those ballots.

13 **Q.** And, Dr. Adida, in your experience, do you have an
14 estimate of how many jurisdictions are intending to conduct
15 risk-limiting audits in November of this year?

16 **A.** Yes. So risk-limiting audits were invented in late -- the
17 late 2000s. And -- but Colorado was the only state that
18 implemented risk-limiting audits other than some small pilots.
19 And they first did that in 2017.

20 We have been working with a number of jurisdictions around
21 the country to increase the implementation of RLAs. And we
22 expect this year in November to see three, four, maybe five
23 states run statewide RLAs.

24 So it is something that is up and coming. It is extremely
25 promising for election security. But it is not every state

1 yet. It is just a small number of states of which we're
2 hoping, of course, Georgia is going to be one of them.

3 **Q.** And I guess to that end, would it be safe to say it is not
4 the norm in all 50 states at this point?

5 **A.** It is not the norm in practices yet. It is very much the
6 norm that the overwhelming majority of election security
7 experts want to see.

8 **Q.** And specific to VotingWorks' work in assisting
9 jurisdictions with implementing audits, what other
10 jurisdictions other than Georgia are you working with?

11 **A.** So we have worked with the State of Michigan, the State of
12 Rhode Island, the State of Pennsylvania -- let me make sure I'm
13 remembering them all -- the State of Virginia. We've -- I
14 think I'm forgetting one. But there's -- we have had -- I
15 think we've worked in the State of Missouri too and the State
16 of New Jersey.

17 So a number of states that we are working with at
18 different levels of progress. So some states are very early on
19 in their exploration. Some states have conducted statewide
20 legally binding RLAs. So we have various stages. But we're
21 talking to a number of them, and we're working with a number of
22 them.

23 **Q.** And you mentioned a point there that kind of leads into my
24 next question. When you work with those jurisdictions to
25 implement audits, what does that process entail of implementing

1 an audit?

2 **A.** So what we found through our work in -- working with
3 states in implementing audits is that process itself of running
4 the audit, it requires a good amount of training and it
5 requires a good amount of development of new processes to make
6 sure that you are doing -- you are managing the paper ballot
7 custody process, to make sure that you understand that the
8 local election officials in all of the counties understand the
9 process for selecting ballots to be audited, retrieving them,
10 making sure you keep your spot in the right -- in the batch,
11 entering the data from the ballot, et cetera.

12 So there is a lot of work to do to get everybody up to
13 speed in running an RLA. And so we have -- our experience is
14 to start small and to develop that process in a number of
15 pilots. Our experience is that that is the most promising
16 approach to getting into a successful statewide risk-limiting
17 audit.

18 One thing I should mention that is not always clear -- and
19 I just mentioned counties and the state. An RLA is -- has this
20 interesting property that the number of ballots that you need
21 to go find and audit depends on two factors. It depends on how
22 close the contest is. So if the contest is really tight, then
23 you are going to need to look at more ballots. If the contest
24 is -- you know, if the margin of victory is super high, then
25 you won't need to look at quite as many ballots. So that is

1 one. How tight the margin is is one factor.

2 The other one is how -- what is your -- what is the risk
3 limit and why. How much confidence do you want? Of course,
4 the higher the confidence, the more ballots you want to look
5 at.

6 Interestingly, one factor that it does not depend on --
7 that the work does not depend on is how many total ballots were
8 cast in the election. That mostly does not affect the amount
9 of work done.

10 And the reason I mention the detail is that it is actually
11 really important to the operation of an RLA. What it means is
12 really you want -- you want to do the RLA at the state level
13 because at the state level you are going to do a certain amount
14 of work that if you try to do it at the county level you would
15 be replicating that same work for however many counties you
16 have. So you might as well do it on a lot more ballots because
17 it is the same amount of work as it is for fewer ballots.

18 However, the paper ballots are stored at a county level or
19 at the jurisdiction level. So you now need to do a dance to
20 coordinate the process of knowing where all the ballots are,
21 sampling which ballots you are going to audit, and then
22 dispatching those orders to sample the ballots to the various
23 counties so that they can do the work of going to batch 17 and
24 finding ballot 32 and retrieving it and entering that data into
25 the auditing worksheet. And that is the process that needs

1 training and tooling and just, you know, debugging along the
2 way. That is the software that we produced, Arlo, to help run
3 that process. And that is the training we provide to states to
4 help them understand how that process should go.

5 **Q.** Thank you. And so I'm trying to understand kind of
6 generally you view this as two separate aspects, one being the
7 software being its own thing and then the second thing the
8 process around how you get to the point of putting ballots in
9 the software?

10 **A.** Correct. I would even split it up into three steps. The
11 first step is like the math, the formulas for Arlo, which have
12 been determined and written and peer reviewed by folks like
13 Professor Philip Stark, who is one of the inventors of the math
14 and the formulas. And then there is the software around that
15 that is the work flow. How do you dispatch the request to the
16 county to have them go look at certain batches and certain --
17 and what not? And then there is the training of the people to
18 use the software and to apply the work flow.

19 So that is how I would think about it.

20 **THE COURT:** I'm sorry. I didn't hear where you
21 said -- before you said you really have to look at chain of
22 custody on ballots. And where does that come in in your three
23 steps?

24 **THE WITNESS:** How does the chain of custody -- I'm
25 sorry. I was separating the work in terms of three categories.

1 So the ballot chain of custody training to help make
2 sure that the process for maintaining where the ballots are, et
3 cetera, that was in the third piece, Your Honor. The part
4 where we're training people on how do you manage the ballot
5 custody -- the ballot custody process.

6 This is -- the really powerful thing about
7 risk-limiting audits and training counties and states to run
8 risk-limiting audits is that it helps kind of debug all the
9 kinks in the system. Right? They feel like, well, I can't
10 find this batch. All right. Well, we have to do a better job
11 of figuring out how we label the batches and figuring how we
12 know where they are stored because the audit is a really good
13 forcing function for making sure that everything else in the
14 ballot custody process is running smoothly.

15 Does that answer your question, Your Honor?

16 THE COURT: Well, I just -- I don't really -- you
17 will walk me through -- you said the second category was
18 software flow. Then you said the next one was training. But
19 then you got back to work flow also there.

20 THE WITNESS: Yes. The software -- I understand
21 where I'm being confusing. The software implements the work
22 flow between the states and the counties, meaning it manages
23 the dance of -- maybe I should take a step back and give you a
24 little bit more of an explanation.

25 THE COURT: We are sort of time-limited. So that is

1 all right. I mean, I will see if it makes a difference. That
2 is fine.

3 I just was trying to understand since there are
4 issues that are posed in this case about the actual -- what
5 ballots actually show as well as the actual functionality of
6 the software itself for counting the votes, that is what I was
7 trying to find out where was that in your process.

8 THE WITNESS: Yes.

9 THE COURT: But I think when -- you know, either it
10 will or will not come out during your examination.

11 THE WITNESS: Okay. I'm happy to answer more
12 questions.

13 **Q. (BY MR. MILLER)** Dr. Adida, in terms of your involvement
14 with Georgia's implementation of RLAs and pilots, can you
15 describe kind of that scope that VotingWorks had?

16 **A.** Yeah. So we started engaging with Georgia in 2019
17 alongside the organization Verified Voting. That is another
18 organization that has been working on implementing
19 risk-limiting audits. And we worked with them in a first
20 pilot -- we usually go and look for one county -- to debug the
21 process in one county.

22 I think the first county was -- I hope I'm pronouncing
23 this correctly -- Bartow County. I don't know if it is Bartow
24 or Bartow. I hope -- I was not the person on the ground there.

25 But in that county, we did the first pilots in 2019

1 alongside Verified Voting where I believe it was Verified
2 Voting that was leading the charge on training in that
3 particular case. And they were using Arlo, the software that
4 we -- that we produce to run the actual work flow of the audit.

5 There was also -- we have also done a pilot in Fulton
6 County. And we have done another pilot most recently in Glynn
7 County. And those are the three pilots to my knowledge that we
8 have done in Georgia to date.

9 Again, these are small pilots. They are single county.
10 They are meant to debug the process. They are just, you know,
11 first steps on the way to an actual statewide risk-limiting
12 audit.

13 **Q.** Dr. Adida, speaking of that process, could you walk us
14 through kind of the soup to nuts of preparing for and executing
15 an audit.

16 **A.** Yeah. So the most important thing is -- you know, the
17 software that we built is software that is explicitly made to
18 be used by any state. So that we're working on -- it is the
19 same software for everybody.

20 When we go into a county, what we need to understand is
21 how do they store the data about where their ballots are
22 stored, what we call a ballot manifest. Right? What are the
23 batches, batch sizes, what are their locations, what are their
24 numbering, do we have a catalog, do we have that manifest file
25 that explains -- usually it is a spreadsheet files that says

1 where each batch is located, what it corresponds to. So there
2 is some training around that and some debugging of that
3 process.

4 There is also the process of the actual ballot retrieval
5 itself. So in the first step of the risk-limiting audit, every
6 county once it is statewide -- every county uploads their
7 ballot manifests into the software Arlo. And, again, the
8 ballot manifest -- you can think of it as a simple spreadsheet
9 that says here are all the batches of ballots I have. Here is
10 how many is in the batch. And here is where they are located
11 in case I have to go retrieve that batch.

12 That gets uploaded to the software. The software
13 aggregates that data. And at the state level, we literally
14 roll some dice to generate some random numbers. That is done
15 in the public eye with everybody watching. And then those --
16 that random number selection is used to do the sampling of the
17 ballots -- the random sampling. So we don't know ahead of time
18 which ballots will be sampled.

19 Once those ballots are sampled, the orders are dispatched
20 back to the counties. So there is an order sent back to each
21 county that says, I need you to look at batch 32 and give me
22 ballots 5, 12, and 39, for example. And so those orders are
23 dispatched to the counties. And the counties at that point to
24 make things go as fast as possible, they will usually have a
25 handful of teams working in parallel, what we call audit

1 boards.

2 And each audit board is then tasked with going to get one
3 or two batches and the ballots from those batches. They have
4 to bring those ballots back to their table. And together in a
5 bipartisan way with more than one person from more than one
6 party looking, they look at that ballot and they interpret
7 voter intent as it exists on that piece of paper. And this is
8 really, really important. This is humans interpreting voter
9 intent. There is no machine involved in this.

10 And that intent is then entered back into the software
11 which re-aggregates the data at the state level, checks to see
12 if that data matches the expected result based on what the
13 claimed winner was. And if it does, then great success is
14 declared.

15 And if not, if there is something that looks a little bit
16 off, like, hmm, that margin doesn't look exactly the way it
17 should based on the physical formulas again of Professor Stark,
18 then there is a so-called escalation where we say, okay, we
19 need to do another round, we need to increase the sample size,
20 maybe we just got unlucky, and maybe we just -- you know, our
21 sample size unluckily picked ballots that are not
22 representative of the whole sample. So we need to look at a
23 few more. Then the process goes on like this until we reach
24 the risk limit.

25 We designed the Arlo system to try to hit that sweet spot

1 where you have pretty high chance of completing the process
2 early because nobody likes to go through a lot of different
3 rounds of this.

4 But, you know, when you are doing sampling, just like if
5 you were to do a survey of people, you might get unlucky in
6 your sample and you find something that is not representative
7 as a whole. So you might have to do a little bit more work.

8 I'll pause here. I'm happy to answer more questions. I
9 hope that explains the process.

10 **Q.** I think so, Dr. Adida. You mentioned the Arlo software a
11 few times. Am I correct in understanding that is an open
12 source software?

13 **A.** Yes. So Arlo is an open source piece of software that we
14 have been building for the last year. We are lucky enough to
15 get assistance from the Department -- financial assistance from
16 the Department of Homeland Security to build this software.
17 And it is open source and available to all.

18 **Q.** And, Dr. Adida, are you familiar with the State Election
19 Board rule in Georgia regarding risk-limiting audits?

20 **A.** I am a little bit familiar with that. I had somebody on
21 my team who worked with the State on it. And I have seen it,
22 yes.

23 **Q.** So there's been some discussion here today about auditing
24 multiple elections or auditing every election throughout the
25 State.

1 Is that type of concept feasible in your mind?

2 **A.** Just to be clear, I think you mean every contest in an
3 election? Is that --

4 **Q.** Yes.

5 **A.** So, again, the key thing to understand in terms of the
6 work required -- well, sorry. Let me back up. What are we
7 testing for in an RLA? There are two things we're testing for.
8 We are testing for the possibility that the scanners are
9 misconfigured and/or otherwise buggy and that they are just not
10 reading ballots correctly. That is one thing we're trying to
11 protect against.

12 The other thing we're trying to protect against, to be
13 clear, is large scale attacks, malicious data attacks, things
14 that -- malware included on a scanner that could make a scanner
15 behave perfectly well when it is being tested by the testing
16 lab and then behave badly on election day.

17 Arlo is meant to control both of those situations. And as
18 I said before, the work required in an RLA depends on how tight
19 the margin is and what kind of risk limit we want to reach. If
20 you wanted to audit every contest on a typical ballot, which is
21 going to be 15, 20, maybe more contests -- right? -- you may
22 end up auditing a ballot that is pretty far down the ballot
23 like, you know, a local position that may happen to be very
24 tight in terms of its margin and you may explode the amount of
25 work you are doing honestly for something that is probably not

1 the target of a nation state attack, let's say. So what you
2 want to do is you want to be judicious in how you apply the
3 resources you have, the time you have to audit the most
4 important stuff.

5 So the recommendations we usually give is, of course, you
6 audit the top contest. If it is a contest -- if it is a race
7 for president, you are going to audit that. Right? And you
8 may pick one or two other contests to audit opportunistically.
9 And that is usually the most efficient way to go about it.
10 Because, otherwise, if you try to do all of them, you are going
11 to end up spending so much time and money that you are not
12 going to be able to certify the elections in any reasonable
13 amount of time.

14 **Q.** Thank you. And in your opinion, would a sudden change in
15 the auditing process be fruitful or easy to implement?

16 **A.** You mean in time for this November?

17 **Q.** Sure.

18 **A.** Yes. That would be a disaster. I think it is really --
19 you know, the power of risk-limiting audits were first
20 developed and refined and peer reviewed in academic circles.
21 So the methodology was really, really thought through and
22 pushed on and questioned. And then there were pilots around
23 the country that tried to test things out. The methodology was
24 refined. And Colorado came out. And then every state gets
25 trained and adapts their processes to it.

1 These things take time to do well. Changing them last
2 minute can be catastrophic.

3 **Q.** Dr. Adida, I believe the Court mentioned this earlier and
4 I'm sure you are aware of just being in the elections and
5 auditing space of claims by some that BMD ballots cannot be
6 used as the basis for an audit because they are not verifiable.

7 Are you familiar with the claim I'm talking about?

8 **A.** I am familiar with the claim, yes.

9 **Q.** And have you read the paper by Dr. Bernhard and
10 Dr. Halderman titled Can Voters Detect Malicious Manipulation
11 of Ballot-Marking Devices?

12 **A.** I have read it quite closely. I think it is a very
13 important paper. And I should disclose in case it is not clear
14 that Dr. Matt Bernhard, who is the source author on that paper,
15 is as of very recently an employee of VotingWorks. So we are
16 looking forward to working closely with him.

17 **Q.** And, Dr. Adida, do you have an opinion on the thrust of
18 that paper or what that paper stands for per se?

19 **A.** Absolutely. My interpretation of the paper -- and it is
20 my understanding that it would be Dr. Matt Bernhard's
21 interpretation too from my conversations with him -- is that
22 that paper indicates that -- there are two questions that have
23 always been asked about -- well, there's more than two -- but
24 two of the questions that have been asked about ballot-marking
25 devices is can voters even verify their ballots and the second

1 one is, if they can, do they. Right?

2 And this paper in my mind -- in my interpretation says
3 yes, voters absolutely can verify their ballots if given the
4 opportunity and given the proper nudges. Right?

5 There are discussions left to be had. There are
6 improvements left to be had on how often they actually do. And
7 I think it is really important to continue to push the science
8 forward on that and to understand what things we can do to make
9 sure that a lot of voters actually confirm their ballot.

10 But the very important question that was up in the air for
11 a while aren't even able -- is this a cognitive task that we
12 can ask voters to. And the paper answers that in the positive
13 in my opinion.

14 MR. SPARKS: I believe Mr. Brown asked to be unmuted.
15 I just wanted to bring that to your attention.

16 MR. MILLER: I'm sorry. Mr. Brown, did you mean to
17 offer anything?

18 MR. BROWN: No. I was going to make sure -- I was
19 about to object. But I just wanted to make sure I was unmuted.

20 **Q.** (BY MR. MILLER) And so, Dr. Adida, on the kind of general
21 debate as to whether a risk-limiting audit is worth anything on
22 a BMD, do you have an opinion as to that matter?

23 **A.** Absolutely. I think my opinion is that they are
24 incredibly important. Like a number of other security experts,
25 I believe that once we have paper ballots, the next most

1 important thing to implement is risk-limiting audits, whether
2 those ballots are produced by a printer from a computer or
3 whether they are marked by a human.

4 As long as the voter gets a chance to verify that ballot
5 on paper, then the RLA is incredibly important. One analogy I
6 like to use, because some folks will question like, well, did
7 the voter really check the ballot -- and there are very
8 worthwhile debates to be had about what can we do to make sure
9 more voters check their ballots.

10 I like to think of that as we are having a debate over the
11 quality of the lock on the front door. Right? We have got a
12 house, and we have got a lock on the front door, which is this
13 paper ballot. And we are having a debate as to whether this
14 kind of paper ballot is, you know, the super strength lock or
15 the medium strength lock.

16 And, meanwhile, the RLA is calling out and saying, hey,
17 the back porch window is open. Could we, like, close that one
18 please? Because ultimately nothing right now checks the
19 tabulation -- without an RLA, no one is checking that the
20 computer is doing the tabulation or doing their job properly.

21 And this is a problem around the country. Right? So
22 implementing that RLA and saying, well, at least we're counting
23 the paper properly is really closing this wide open window that
24 is so important to close and that I wish many more states were
25 engaging in.

1 THE COURT: We know Shannon will interrupt if there
2 is a problem. Go ahead.

3 **Q. (BY MR. SPARKS)** I apologize. Dr. Adida, you are
4 assisting Secretaries of State with developing and implementing
5 risk-limiting audits on a statewide basis? That is right?

6 **A.** In Georgia, yes. We are, yes.

7 **Q.** You assisted with the drafting of the risk-limiting audit
8 rule that was adopted yesterday by the State Election Board; is
9 that right?

10 **A.** Sorry. I don't know this information about what was
11 adopted yesterday. We have -- I assume it is what we have --
12 we did indeed work -- we made some suggestions to the State
13 that were based on the statute in Rhode Island. We did indeed
14 make suggestions to the State of Georgia based on those, yes.

15 **Q.** I'll get to Rhode Island in a moment.

16 Now, surely you are or VotingWorks are being compensated
17 for your advice to the State; is that correct?

18 **A.** We are being compensated specifically for the training and
19 operations of risk-limiting audits. I am not being compensated
20 for this testimony. Yeah. But we are actually being
21 compensated for assistance in implementation of risk-limiting
22 audits.

23 **Q.** Yes. And you agree that voters should have a choice to
24 use hand-marked paper ballots at polls if they want to; isn't
25 that right?

1 **A.** I would like that, yes. I think that's -- it would -- I
2 believe in voter choice, and I like that idea. Yes.

3 **Q.** And VotingWorks is actually a vendor of barcoded
4 ballot-marking devices just like Dominion; isn't that right?

5 **A.** That is one of the things we do, yes. It is not the only
6 thing. But yes.

7 **Q.** You also offer software as discussed; right?

8 COURT REPORTER: I'm sorry?

9 **A.** I'm sorry? I didn't hear that.

10 **Q.** (BY MR. SPARKS) I'll try to slow down. Forgive me.

11 You also -- we discussed earlier that you sell auditing
12 software? I think Arlo is the name. Is that right?

13 **A.** Right. So to be more specific, we -- we -- the software
14 is always available free. What we provide is support,
15 training, and hosting for it. But the software itself is free
16 and open source and funded by the Department of Homeland
17 Security.

18 **Q.** And it is also your view that with respect to voting
19 systems the most secure systems tend to be the ones that have
20 received intense public vetting; isn't that correct?

21 **A.** I don't know where you are pulling that quote. But in
22 general, I agree with the spirit of that, yes.

23 **Q.** You have also testified that deploying risk-limiting
24 audits is quite a challenge and endeavor; correct?

25 **A.** Yes, I have. Yes.

1 Q. All right. And, in fact, Georgia intends to perform just
2 one risk-limiting audit of a contested statewide race in 2020;
3 correct?

4 A. I don't actually know what the exact plans are. But
5 certainly it would -- that would be a pretty reasonable first
6 step in my opinion for a statewide risk-limiting audit.

7 Q. That was part of the proposed rule that you helped to
8 draft?

9 MR. MILLER: Objection, Your Honor, for
10 characterizing the proposed rule as a legal matter and what it
11 says. I think we can at minimum have the rule up.

12 But also I think Dr. Adida has already said he didn't
13 do the actual scrivener's work of drafting the contents.

14 MR. SPARKS: I'm just referring to the document in
15 his declaration, Paragraph 11.

16 THE COURT: What paragraph are you referring to?

17 MR. SPARKS: I'm sorry. I was going off of
18 Paragraph 11 of Dr. Adida's declaration, 834-2 in the record.

19 Q. (BY MR. SPARKS) Dr. Adida --

20 THE COURT: Dr. Adida, did you, in fact, assist in
21 providing -- draft of the Election Board -- State Election
22 Board rule?

23 THE WITNESS: Absolutely, yeah. I'm pulling it up
24 now. Yes, we have. I have reviewed it at a high level. I'm
25 not the individual who worked on that. That was our Monica

1 Childers, who is one of the world's experts in implementing
2 RLAs. But yes, that is right.

3 So I certainly know that our recommendation in
4 general is to start with a small number of contests. It was
5 not in my mind as to exactly whether we recommended one or two
6 or an exact small number.

7 I apologize for not making that clear.

8 MR. MILLER: Well, Your Honor, I will point out while
9 the declaration is up in Paragraph 11 it begins there
10 VotingWorks has assisted the Secretary of State's office and
11 then goes on to say that included. In other words, the point
12 being VotingWorks rather than Dr. Adida personally.

13 THE COURT: All right. Well, I really didn't care.
14 It was a question of the organization run that he is testifying
15 on behalf of and obviously has a role in. But that is fine.

16 MR. SPARKS: Terrific.

17 **Q. (BY MR. SPARKS)** Dr. Adida, in your own words, without a
18 risk-limiting audit, we are effectively trusting computerized
19 scanners to count our paper ballots?

20 **A.** That is correct. Exactly right. Except if you do a full
21 hand count. But yes. Other than those two situations, yes, we
22 are trusting the scanners.

23 **Q.** And in speaking -- I know you mentioned Rhode Island
24 earlier and that the Rhode Island statute was the basis for the
25 rule that we just discussed.

1 Is that accurate?

2 **A.** It was what we suggested as a model to the State of
3 Georgia.

4 **Q.** Okay. And are you aware that Rhode Island uses
5 hand-marked paper ballots and a ballot-marking device per
6 precinct for accessibility reasons, just like our clients are
7 seeking in this case here?

8 **A.** I did not have that off the top of my head, but I
9 certainly believe it.

10 **Q.** And VotingWorks has never assisted with a statewide RLA in
11 a state that uses only ballot-marking devices at the polls for
12 non-provisional ballots; isn't that correct?

13 **A.** We -- so I want to make sure that I restate this in case
14 it wasn't clear. If the paper ballots have a chance to be
15 verified by the voter, they can be used in an RLA whether they
16 were BMD-produced or hand-marked produced.

17 So we are not going around to the states we are talking to
18 and double-checking which kind of voting system they used, as
19 long as it is -- the voter can verify it.

20 I believe there are some areas in Pennsylvania that use
21 all BMDs. I could be mistaken. I'm saying this off the top of
22 my head. But we have worked in the State of Pennsylvania where
23 that is the case. We have worked in states where there are
24 BMDs. We have worked in states where there are hand-marked
25 paper ballots. Both.

1 **Q.** Thank you, Doctor. I understand where VotingWorks has
2 worked. I just wanted to make sure that I hadn't misunderstood
3 the states where you worked and whether any of them used BMDs
4 on a statewide basis on election day. And I believe I
5 understand now. So thank you.

6 **A.** Okay.

7 THE COURT: The answer was after all that yes or no?

8 THE WITNESS: So my -- to the best of my knowledge,
9 Georgia is the only state so far that we have worked that is
10 all BMDs. But I have not done the -- yeah -- to the best of my
11 knowledge, yes.

12 **Q. (BY MR. SPARKS)** Dr. Adida, you have no reason to dispute
13 the idea that Georgia does not presently plan to do more than
14 one statewide audit in one contested race every two years as
15 currently planned; is that correct?

16 **A.** I don't know enough about the details of those plans
17 really to comment on that question.

18 MR. SPARKS: Your Honor, I don't have any further
19 questions at this time.

20 MR. MILLER: Your Honor, I do have just one or two
21 quick questions.

22 THE COURT: I'm sorry, Mr. Miller. Just one second.
23 I want to make sure that there were no other questions from
24 other counsel.

25 MR. MILLER: Right. That is what I was asking.

1 MR. BROWN: Dr. Adida, I just have one question. It
2 may go to two or three, but it is just on one topic.

3 CROSS-EXAMINATION

4 BY MR. BROWN:

5 **Q.** To go back to your metaphor of the back door and the front
6 door, it is essential for voting that both locks be good;
7 correct? Front and back?

8 **A.** What I would say is that elections are an extremely
9 complex system. And there are many, many doors and windows.
10 And it is essential to make sure that we strengthen all of
11 them.

12 They are not closed or opened. They have different
13 strengths. And the gaping one right now is tabulation. And,
14 of course, we should continue to improve every other aspect.

15 **Q.** You understand that -- you understand this lawsuit is not
16 about tabulation auditing and that whether there are
17 hand-marked paper ballots or BMD ballots everyone agrees that
18 the tabulation auditing needs to be as best as it can? Do you
19 understand that?

20 **A.** Yeah. I'm not -- I have not reviewed all of the details
21 of the lawsuit. I can simply say I'm called to testify on the
22 specifics of the RLAs, which I think Georgia is following good
23 practices on deploying. But I can't comment on all the rest,
24 of course.

25 **Q.** If you backed up just a second, one question, just in the

1 logic of the auditing, is the BMD -- the product of the BMD is
2 in the accurate recapture of the voter's choices? Are you with
3 me? That is the first one question. And then the second
4 question is whether the tabulator counts what the BMD has said
5 about the voters correctly; right?

6 MR. MILLER: Your Honor, I believe counsel literally
7 proposed a compounded question there.

8 THE COURT: All right. Then restate it, Mr. Brown.

9 **Q. (BY MR. BROWN)** It is a two-part process. The first
10 process would be determining whether what the BMD says about
11 the voter's choices collectively is correct and the second part
12 is determining whether the tabulators count all of that
13 correctly.

14 Do you follow me?

15 **A.** I don't quite agree with how you framed the first part. I
16 can -- I want to be very, very clear that the voter verifying
17 that paper ballot -- and we obfuscate that quite a bit. Right?
18 There is a paper ballot that the voter is looking at. It is
19 that act of verification that is critical. It is not -- we are
20 not trusting the BMD to just do its job. There is an act --

21 **(Unintelligible cross-talk)**

22 MR. BROWN: That is what I'm getting at.

23 THE COURT: All right.

24 MR. MILLER: I'm sorry. If the witness could --

25 MR. BROWN: Do you have an objection? Is that an

1 objection? Don't just --

2 THE COURT: All right. Mr. Miller, let Mr. Brown
3 finish. Just ask the question and be sure not to do a compound
4 follow-up.

5 **Q. (BY MR. BROWN)** Dr. Adida, your analysis depends upon your
6 assumption that a sufficient number of voters check their
7 ballot correctly; right?

8 **A.** I don't know what analysis you are talking about. I'm
9 saying that the process -- yeah. I would love for
10 clarification. Tell me more about what you are asking.

11 **Q.** What you are saying is that your RLA that you would do for
12 Georgia will be effective in determining whether the correct
13 outcome was achieved so long as you assume that the BMD has
14 accurately captured the voter's choices; correct?

15 **A.** I think this kind of framing is -- is oversimplistic.
16 There is no single auditing act that can tell you that
17 everything went well in an election. For example, I can't
18 figure out if everybody at the precinct was allowed to vote
19 properly given the same chance, the same amount of time.

20 Like, there's lots of things that have to be checked in an
21 election. So the RLA -- I want to be very specific. The point
22 of an RLA is to check the tabulation of the votes matches what
23 the voters saw on the paper ballot. That is the only role.

24 And attempts to try to enlarge that role I think are
25 misguided because you can't get that out of any audit. There's

1 lots and lots of different things you have to check.

2 **Q.** Right. And what you mean in Georgia it is not so much
3 what the voters saw on the paper ballot but what the BMD
4 printed on the paper ballot?

5 **A.** No, I don't agree with that. I think that there is --
6 there is evidence that voters can check. There is evidence
7 that voters are capable of checking. And I think there are
8 sometimes attempts to assume that voters are not looking at the
9 paper ballot. And I don't think the evidence holds up to that
10 in my expertise.

11 THE COURT: Dr. Adida, I'm not saying that you are
12 wrong, right, whatever else. But I am trying to say when there
13 is evidence -- we have had very few elections. So I'm trying
14 to understand what is the evidence that you are relying on.

15 THE WITNESS: Of course. Of course. I'm sorry that
16 I wasn't clear about that. The evidence that I'm talking about
17 is the research that I have read that was already mentioned in
18 this on the paper that -- by Dr. Bernhard and Dr. Halderman
19 that giving the right nudges voters are able to check their
20 ballots. That is what I was referring to.

21 Sorry for not being clear.

22 THE COURT: Are you citing to something in Georgia?
23 I mean, that is what I'm trying --

24 THE WITNESS: No. I'm sorry. I'm not citing any
25 particular things in Georgia. Sorry for not being clear.

1 THE COURT: Okay.

2 MR. BROWN: That is all I have, Your Honor.

3 THE COURT: Go ahead, Mr. Miller.

4 MR. MILLER: I think actually my questions were
5 answered there. That is all I have.

6 THE COURT: I had a question.

7 EXAMINATION

8 BY THE COURT:

9 **Q.** I think you have focused on -- in response to Mr. Brown's
10 and Mr. Sparks' questions to basically that you are -- your
11 focus is still that because the voter in your view has an
12 ability to review the ballot that that basically brings back
13 part of the equation to a conclusion and you are looking at
14 does the -- do the numbers as tabulated correspond to the
15 ballot.

16 You don't have any information about what might happen
17 when the ballot goes in though. I mean, you are assuming that
18 the ballot at this juncture -- and maybe not. That is what I'm
19 trying to understand -- that this ballot is what is going to
20 control and do you -- is that right?

21 **A.** I apologize. You cut out right at the beginning of that
22 formulation, and I didn't hear it.

23 **Q.** Part of the contention in this case, which you may know
24 and I assumed as a highly learned person you do know, is that
25 the -- that there can be malware involved here that

1 basically -- which is the bane of modern technology's
2 existence, but it makes different forms, and that the data can
3 be changed.

4 And so there are two ways in which that can manifest
5 itself. One is -- if one is really concerned about the
6 results. One can be -- it can be a change in the ballot that
7 you posit that the individual got to correct even though it may
8 have 50 or 60 slots for them to have looked at and checked.

9 The second one is simply that the vote -- that the actual
10 results are changed even though they may look at it and it may
11 look a certain way but, in fact, it is -- in the scanner that
12 it simply counts in a different way.

13 **A.** That's correct. Yes.

14 **Q.** Or that it might even remove some of their votes.

15 **A.** What were the last words? Something about their votes?

16 **Q.** It might remove some votes.

17 **A.** Remove the votes. Yeah, you are worried about the scanner
18 doing all sorts of things.

19 **Q.** There's many different ways in which the scanner or the
20 printer could alter things --

21 **A.** Right.

22 **Q.** -- theoretically.

23 **A.** Yeah.

24 **Q.** So -- but your assumption is -- I'm just trying to figure
25 out: Where are you looking at the tabulation? Are you

1 comparing the ballots to the total? I don't really understand
2 what you are --

3 **A.** I understand your question. Thank you.

4 **Q.** Tell me (electronic interference) places here that are at
5 issue -- are at issue in this case.

6 **A.** I completely understand. So specifically what we are
7 doing in our work with Georgia in the risk-limiting audit is we
8 are looking at the process that takes a stack of ballots --
9 right? -- the stack of ballots produced by whether they were
10 hand-marked or whether they were produced by a machine -- we
11 take the stack of ballots. They go through the tabulator. And
12 I want to highlight again that it is -- it is a --

13 Sorry. I don't know why my watch is buzzing.

14 There is a stack of paper ballots that are about to go
15 through a scanner, that go through a scanner, and then the
16 scanner tells you the results.

17 The point of an RLA is to make sure that bugs,
18 malfunctions, dust on the scanner, nation state attacks do not
19 corrupt that function. That is the main function of the RLA.
20 That is the most important function of the RLA.

21 And that is the work that we're doing specifically with
22 the State of Georgia. You mentioned -- one thing you had
23 stated, you know, is the assumption that the voter looks at all
24 the contests even if there are 50 of them. One thing I think
25 is useful to talk about when you are thinking about it is the

1 kind of attacks we are defending against.

2 Well, we are defending against malware, as you mentioned,
3 which you are right, is the bane of existence in anything that
4 is computerized. When you are defending against malware, you
5 look at where an attacker is likely to attack. Right? And
6 they are likely to attack and use malware which to attack the
7 race for president or for senator, you know, the top contests.
8 Right?

9 So that is why -- one, that is why I generally have
10 optimism that voters will and can check that because those are
11 the contests they are going to really be looking at. And it is
12 also why we, of course, recommend that those be the -- and this
13 is kind of obvious -- that those be the races that get audited
14 first in the risk-limiting audit.

15 I hope that answers your question. But I'm happy to
16 answer more.

17 **Q.** Well, I guess I'm not -- I'm not really sure. You are --
18 you are saying -- what are you doing is you get the ballots and
19 you run them again or you physically calculate?

20 **A.** Got it. So we do not run them again. In the normal
21 process of tabulation before we get involved at all, the
22 ballots go through the scanner and the scanner provides the
23 results.

24 The process of the RLA in terms of tabulation is entirely
25 human-based. In other words, people that work with the county

1 on the audit board go fetch the ballots and they look at them.
2 Actually, the really important part of that that was part of my
3 written testimony that I'll reemphasize is that QR code doesn't
4 matter at this point. The only thing that the humans are
5 looking at when they pull out that ballot is the text that the
6 voters looked at on the piece of paper. That is what they are
7 looking at. And that is what they are recording as part of the
8 audit process.

9 And so the software in the case of -- in the auditing
10 portion is only used for aggregating the results in a way that
11 can be verified by all public observers. Because the other
12 thing is that all of the data from an audit should be public
13 for folks to review.

14 So the scanner tabulation happens only during the normal
15 tabulation of the election. And the RLA bypasses that, does
16 not go back through the scanner. It is human tabulation of a
17 subset of ballots that is statistically representative of the
18 whole, and that is what we do.

19 **Q.** I'm sorry.

20 **A.** This can be confusing.

21 **Q.** I understand the assumptions that are built into what you
22 are doing. But I just don't understand the process completely.
23 So -- all right. You now have -- you have stripped the
24 ballots, which were stripped. They are not like --

25 **A.** Yeah.

1 Q. They are more like a grocery printout?

2 A. Yes.

3 Q. And then you are -- so you are counting those up again,
4 and then you are identifying the numbers that you have and you
5 are running those numbers -- seeing the ways those were
6 recorded in the system?

7 A. So that's an excellent question. So the part I didn't get
8 to earlier is there are different types of risk-limiting
9 audits. There are different flavors of it. I'll give you the
10 high level. And then I'll dig into as much detail as you need.

11 Q. Just tell me what you are doing in this -- what the State
12 is planning to do here. I have about two and a half more hours
13 of testimony. So --

14 A. I apologize. I'm sorry.

15 Q. It is quite all right. I'm just trying to know what you
16 were planning to do and whether you are also going to be
17 looking at the original -- for the hand ballots the original
18 physical ballot, not a digital copy of it.

19 A. Got it. Okay. So what we are doing in the State of
20 Georgia is a flavor of risk-limiting audits called ballot
21 pulling. And the flavor depends on what you can do based on
22 the configuration of the state. I'm happy to tell you more if
23 you are interested.

24 But the flavor of ballot pulling is one where you pick a
25 statistically representative sample of the ballots. You count

1 those. And you compare the totals to what you would expect the
2 distribution of the totals to be. You are not comparing one to
3 one ballots. That would be what is called a ballot comparison
4 audit. And I can tell you why that wouldn't be doable in
5 Georgia.

6 But in a ballot pulling, you are just doing a small tally
7 of that subset and you are saying -- let me give you an
8 example. If it was a democratic primary, if it was Sanders
9 versus Biden; right? Let's say that Biden -- I'll give you
10 some real data about one state where we audited.

11 Biden won one of the primaries that we audited by
12 60 percent. It was 80 to 20 for Biden versus Sanders. So you
13 go and you sample some ballots. You, say, sample 100. It
14 comes back and it says Biden has 75 and Sanders has 25. Is
15 that 80/20? Not exactly. But if you plug it into the
16 statistical formula that Phil Stark designed, it will tell you,
17 yeah, that is within what you would reasonably expect if you
18 sampled a hundred so it is good to go. Or no, actually, you
19 know, you got 55/45 for Biden, Sanders. That seems extremely
20 unlikely that you would get something so far off from the 80/20
21 of what was claimed as the total tally. So let's go look at a
22 few more ballots and make sure that something didn't go weird
23 in the tabulation.

24 That is a ballot pulling audit where you are looking at
25 your sample. You are comparing to the full tally. And, again,

1 it is a sample that is tabulated by humans. And if it is
2 roughly what you expect, then you are good. If it is a little
3 bit far out, you grow your sample to make sure that you didn't
4 basically detect a problem.

5 **Q.** Well, then you are measuring again something that already
6 -- it seems like you got confirmation bias in what you are
7 talking about.

8 If, in fact, the election is, let's say, 52 to 48, I mean,
9 I could be -- that could be very close. You could have a
10 larger number. But you have got to again -- if you are
11 thinking about am I going to do this, you have got to have
12 representatives of -- in a state that has a vast variety of
13 voters, you have got to be sure that you have actually got
14 representatives and pull if you are not actually doing a one
15 for one. I just never understood that you were not doing any
16 one for one at all.

17 **A.** Right. So to be very clear, this math that I'm talking
18 about -- so you put your finger exactly on it. If it is 52/48,
19 you are going to need a heck of a lot more ballots than a
20 hundred to get to the high level of confidence that things went
21 well.

22 But the thing I want to be very, very clear about is that
23 the formulas we use to figure out how many ballots you sample,
24 whether you declare victory or not on the audit, these are
25 formulas that were designed by Professor Philip Stark. These

1 are things that have been peer reviewed by academics. Like,
2 there is nothing new. And that is probably one of the areas
3 where everybody would agree, like, the formula is correct.
4 Like, there is --

5 **Q.** What I'm trying to get at is: I didn't understand,
6 frankly, when Dr. Stark testified in the beginning that he was
7 so irritated about -- I'll be just candid. So I think what his
8 concern -- I'm being told my voice is muffled.

9 **A.** Sometimes it is muffled. But I hear you well enough. So
10 I can understand you.

11 **Q.** Let me get a little closer. So it appears that his
12 concern was, in fact -- had to do with just doing one and the
13 more -- and also the way -- now, I'm going to opine on this
14 completely. I have to go back and read his testimony about
15 this.

16 But there seemed to be a whole issue. But I'm going to --
17 you know, I understand that there is some consensus to some
18 extent that is in part now fraying at the edges about some of
19 these issues about how you approach it, what you are doing.

20 But that is -- I'm just trying to understand what you are
21 doing so that I get it because it is what the State is offering
22 as a protection here even though there is significant
23 challenges to the technology and whether both the -- not just
24 the -- basically the challenge to the way that the votes are
25 counted that are in the BMDs as well as ones that are being

1 scanned -- the hand ballots.

2 So that is why I had a lot of questions about what you are
3 actually looking at because there were questions about the --
4 how the scanning had altered the vote potentially.

5 But the point was really about the large sample. If you
6 were expecting 52 to 48 -- and I'm just trying to understand
7 it -- then -- or if you are expecting 55 to 45 percentage, is
8 that confirmation bias? Because then as long as you get
9 something that looks like 55 to 45, it is right? What if that
10 is exactly wrong? It is the flip side.

11 **A.** So the way to think about is it really -- it is a
12 fantastic question. It is a very insightful question.

13 The way you want to do it -- and there are some details
14 that you have got to get right to make sure that the statement
15 I'm making is correct. And that is, you have to have -- there
16 are things you have to get right. Like the count of the
17 ballots has to be something that is verified independently of
18 the voting system. Right?

19 So there are a few details that you want to get right in
20 the RLA for the following sentence that I'm about to make to be
21 true. That sentence is: The voting system is claiming 55/45.
22 Right? You put them through the scanner. And the scanner
23 tells you 55/45. And you, as the auditor running the RLA, are
24 saying, okay, that is the claim. I want to verify. I don't
25 believe it. I want to verify it. I'm going to say is that

1 actually what happened. If it was really 55/45 and if I were
2 to go sample those ballots, the physical ballots over here, and
3 go look at them, then I would expect if I pick, you know, say
4 100 of them, to get maybe or most likely between 53 and 57
5 provided, like in the primary between Biden and Sanders.

6 You know, you are going to be a little bit off
7 statistically. But that is what I would expect. If I get
8 something off of that, then the probabilistic statement that
9 I'm trying to ask is: If this was really 55/45, how likely is
10 it that I got 50/50 in my sample? Right? And then the
11 probability will tell you not very likely. So I smell a rat.
12 Right? I smell a rat in the claim 55/45.

13 What you are doing is you are comparing the claim of the
14 voting system, 55/45, against your physical experience sampling
15 the ballots -- the real ballots that have a chain of custody to
16 them that were filed and you have all the logs, et cetera, and
17 you are saying that's the real thing. Let me go check against
18 the real thing.

19 And in this sample, what I'm getting, is that a believable
20 outcome based on what the voting system is claiming. So you
21 are comparing the claim to the real ballots. And if there is a
22 sufficient mismatch, you smell a rat and you escalate the
23 audit.

24 **Q.** So if you say the most important race is obviously the
25 presidential race. But (electronic interference) our system

1 according to regulations of the Secretary of State --

2 COURT REPORTER: I'm sorry, Judge. You are breaking
3 up. I cannot understand you.

4 **Q. (BY THE COURT)** So if in our new system under the rules
5 adopted, the Secretary of State has the provision to select one
6 race every two years for auditing purposes. That is what the
7 RLA will be. It could be more. But that is what -- that is
8 the provision right now.

9 Do you understand that?

10 **A.** I do understand what you are saying. Yeah.

11 **Q.** So if you have something like a -- knowing what you know
12 about Georgia since you have been consulting, what type of
13 sample would that look like in Georgia for a presidential race?

14 **A.** So that -- so I'm sorry if I didn't make that part clear.
15 You mean, how many ballots you would be looking at? Is that
16 what you are saying?

17 **Q.** Yes.

18 **A.** Yes. So that depends entirely on what the claimed margin
19 of victory is by the voting system. So if the voting system
20 comes out and says it is a 52/48 race, you plug that into the
21 Phil Stark formula and it tells you, in that case, you've got a
22 good sample. So you don't decide the number before the result.
23 Maybe that is the point I should have made clearer from the
24 start.

25 Which is: First, you wait for the voting system, the

1 scanner to make a claim. The scanner is claiming that the
2 results are, you know, 52/48. Then you plug that into the
3 formula, which is what's implemented in our Arlo software based
4 on Philip Stark's formulas. And then that tells you, well, in
5 that case, you've got to go look at 1000 ballots or 2000
6 ballots or 5000 ballots. And so it is adapted to whatever the
7 voting system is saying.

8 **Q.** So let's say you are looking at 2000 ballots. What is
9 your -- I'm just trying to understand this because this is --
10 you know, we have been talking about auditing in one form or
11 another for about two years.

12 **A.** Of course.

13 **Q.** In a place as diverse as Georgia, which is what I was
14 trying to get at before, where we have very different attitudes
15 in different parts of the state and different political
16 affiliations and also urban versus rural, is there -- what is
17 the obligation of the audit to actually in terms of the
18 population size, the voting population actually do a -- what we
19 would in other circumstances say a representative sample
20 geographically, politically, rural, urban --

21 **A.** Yeah. So I'm going to tell you my best understanding of
22 it and admit that there is a level of statistics that goes a
23 little bit outside of my expertise. But I will tell you as
24 much as I know.

25 That is that the formula for an RLA does not assume --

1 does not assume any particular distribution or clustering of
2 votes. It could be anything. And it is basically doing a
3 random sample across the set of ballots.

4 So it is valid whether there are clusters of democrats in
5 this one area and republicans in this one area. The
6 statistical power of the formula withstands that kind of thing.

7 So it is true to the intent of the entire state or, you
8 know, if you are looking at a county race the entire county.
9 But it is true to the overall intent, regardless of how the
10 population clusters. And exactly how that is done, that is
11 where my expertise stops and Dr. Stark's begins.

12 THE COURT: All right. Well, I think we have lots of
13 other things to get to today. I mean, I'm curious. But some
14 of it may not be -- you know, might not be relevant at this
15 point or it may be very relevant because the formula may look
16 good but not be, in fact, (electronic interference) under very
17 complex geographic and democratic circumstances.

18 So, anyway, I appreciate very much your explanation
19 and presentation. And I'm sorry I have to cut you off. But we
20 just have some other witnesses.

21 Is there anything major that counsel feels that they
22 need to follow up on this, knowing what our time schedule is
23 and I had to consume some of it?

24 All right. May this witness be excused?

25 MR. MILLER: Yes.

1 MR. SPARKS: Yes.

2 THE COURT: Thank you so very much, Dr. Adida.

3 THE WITNESS: Thank you, Your Honor. Good luck with
4 the rest of the trial.

5 THE COURT: Thank you. Who is the next -- does
6 anyone need to use the restroom or do anything else for a
7 minute?

8 **(There was a brief pause in the proceedings.)**

9 THE COURT: All right. Who is remaining?

10 MR. TYSON: Your Honor, I believe who we have
11 remaining at this point is Mr. Skoglund, Dr. Halderman, and
12 Mr. Hamilton. They are the three individuals who have the
13 testimony under seal or issues that are with the protective
14 order that are outstanding. So I believe we are at that point
15 in this hearing.

16 THE COURT: All right. Well, I need to excuse all
17 members of the public who are not part of the legal team, as
18 well probably significant parts of the clients. And I think
19 that I'm going to ask each -- when we are through -- everyone
20 to leave.

21 And we'll have to take a minute for everyone to sort
22 of get off who shouldn't be on and then counsel should -- are
23 responsible themselves for checking whether everyone there is
24 proper. Anyone in my chambers may stay who are on or anyone
25 who is affiliated with my chambers. I see Ms. (unintelligible)

1 there. I know Ms. Cole is there someplace. But I don't
2 know -- I haven't gone and looked at the other pages.

3 So, Ms. Cole, are you able to reach Matt to see
4 whether there is a different number that we could use to get
5 on?

6 LAW CLERK COLE: I can create a new meeting.

7 THE COURT: Why don't you create a new meeting then
8 and circulate it just to counsel and they can --

9 LAW CLERK COLE: I can do that.

10 THE COURT: -- submit people that they want. I am
11 going to assume that will take a few minutes. It is 4:56.
12 We'll convene in five minutes then.

13 MR. MCGUIRE: Your Honor, may I ask real quick? Are
14 you expecting to have closings after this that the public will
15 be able to attend, or are we going to just do witnesses?

16 THE COURT: I think we're going to just do witnesses.
17 I think we can't do more. If I need something more that I
18 think will be helpful, I will ask you to do that in writing.

19 MR. MCGUIRE: Okay. Thank you. All right.

20 THE COURT: All right. So Ms. Cole will generate a
21 new number. We'll start in five minutes. All right.

22 MR. TYSON: Could I address one issue before we do
23 that?

24 THE COURT: Yes.

25 MR. TYSON: Mr. Maguire obviously represents

1 Dominion. Would he be appropriate to have in the piece of
2 Dr. Halderman?

3 MR. McGUIRE: Different Mr. Maguire.

4 MR. TYSON: I'm sorry. Matt Maguire who represents
5 Dominion.

6 THE COURT: Dominion's counsel?

7 MR. TYSON: Dominion's counsel.

8 MR. CROSS: Your Honor, we would object to that.

9 THE COURT: Why is that?

10 MR. CROSS: He is a third party. I mean, if this is
11 so confidential that our clients cannot know it and the public
12 can't know it, I don't understand why a third party would be
13 allowed to see this.

14 THE COURT: All right. Well, then he -- I understand
15 the objection. I think it doesn't make full sense but I -- in
16 the sense that it is about software. But I know that the State
17 has been very demanding themselves of all of you. So we're
18 going to just -- I will exclude Mr. Maguire.

19 MR. TYSON: Thank you, Your Honor.

20 MR. CROSS: Thank you.

21 THE COURT: All right. The rest of us will leave,
22 and we'll return in a few minutes. Thank you.

23 **(These Zoom call proceedings were concluded at**
24 **4:57 P.M., and the proceedings continued in a**
25 **private Zoom call, as follows:)**

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MR. RUSSO:

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MR. TYSON: [REDACTED]

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[REDACTED]

Q. [REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

[REDACTED]

THE WITNESS: [REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

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Q. [REDACTED]

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Q. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
A. [REDACTED]
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Q. [REDACTED]
A. [REDACTED]
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Q. [REDACTED]

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[REDACTED]

Q. [REDACTED]

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[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

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THE COURT:

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[REDACTED]

MS. ASCARRUNZ :

THE COURT :

MR. TYSON :

MS. ASCARRUNZ :

THE COURT :

MS. ASCARRUNZ :

THE COURT :

Q. (BY MS. ASCARRUNZ)

A.

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A.

[REDACTED]

Q.

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[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

Q. [REDACTED]

A. [REDACTED]

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[REDACTED]

Q. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

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[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. MAGUIRE: [REDACTED]

THE COURT: [REDACTED]

MR. MAGUIRE: [REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. MAGUIRE:

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

MR. MAGUIRE:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

[REDACTED]

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[REDACTED]

THE COURT:

[REDACTED]

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Q. (BY MS. ASCARRUNZ) [REDACTED]
[REDACTED]
[REDACTED]
A. [REDACTED]
Q. [REDACTED]
[REDACTED]
A. [REDACTED]
Q. [REDACTED]
[REDACTED]
THE COURT: [REDACTED]
MS. ASCARRUNZ: [REDACTED]
THE COURT: [REDACTED]
A. [REDACTED]
[REDACTED]
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[REDACTED]
[REDACTED]
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[REDACTED]
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[REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

A. [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. RUSSO: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

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[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

MR. McGUIRE: [REDACTED]

THE COURT: [REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

MR. RUSSO: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

THE WITNESS: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. TYSON: [REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

MR. MCGUIRE: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

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THE COURT: [REDACTED]

[REDACTED]

THE WITNESS: [REDACTED]

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[REDACTED]

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[REDACTED]

[REDACTED]

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[REDACTED]

BY MR. MCGUIRE:

Q. [REDACTED]

[REDACTED]

[REDACTED]

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MR. McGUIRE:

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

MR. McGUIRE:

[REDACTED]

[REDACTED]

Q. (BY MR. McGUIRE)

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

Q. [REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

Q. [REDACTED]

[REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

LAW CLERK COLE: [REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

[REDACTED]

LAW CLERK COLE: [REDACTED]

MR. McGUIRE: [REDACTED]

LAW CLERK COLE: [REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

LAW CLERK COLE: [REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

[REDACTED]

Q. (BY MR. McGUIRE) [REDACTED]

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A. [REDACTED]

Q. [REDACTED]

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A. [REDACTED]

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Q. [REDACTED]

A. [REDACTED]

Q. [REDACTED]

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A. [REDACTED]

Q. [REDACTED]

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Q. [REDACTED]

A. [REDACTED]

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[REDACTED]

Q. [REDACTED]

MR. McGUIRE: [REDACTED]

[REDACTED]

Q. (BY MR. McGUIRE) [REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

Q. [REDACTED]

A. [REDACTED]

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Q. [REDACTED]

[REDACTED]

A. [REDACTED]

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Q. [REDACTED]

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A. [REDACTED]

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[REDACTED]

Q. [REDACTED]

THE COURT:

[REDACTED]

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[REDACTED]

THE WITNESS:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

THE WITNESS:

[REDACTED]

[REDACTED]

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[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

THE COURT:

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[REDACTED]

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[REDACTED]

MR. TYSON: [REDACTED]

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[REDACTED]

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THE COURT: [REDACTED]

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[REDACTED]
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[REDACTED]
MR. MAGUIRE: [REDACTED]
THE COURT: [REDACTED]
MR. MAGUIRE: [REDACTED]
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[REDACTED]
THE COURT: [REDACTED]
MR. McGUIRE: [REDACTED]
[REDACTED]
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THE COURT: [REDACTED]
MR. McGUIRE: [REDACTED]
THE COURT: [REDACTED]
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[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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THE COURT: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

THE COURT: [REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

MR. McGUIRE: [REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. SKOGLUND: [REDACTED]

DR. HALDERMAN: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

DR. HALDERMAN: [REDACTED]

THE COURT: [REDACTED]

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[REDACTED]

DR. HALDERMAN: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

DR. HALDERMAN: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. SKOGLUND: [REDACTED]

MR. MCGUIRE: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. MCGUIRE: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

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[REDACTED]

MR. MCGUIRE: [REDACTED]

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MR. BROWN:

[REDACTED]

[REDACTED]

MR. CROSS:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. MILLER:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

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THE COURT:

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[REDACTED]

[REDACTED]

MR. BROWN:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. McGUIRE:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. CROSS:

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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THE COURT:

[REDACTED]

MR. CROSS:

[REDACTED]

THE COURT:

[REDACTED]

MR. TYSON:

[REDACTED]

THE COURT:

[REDACTED]

MR. CROSS:

[REDACTED]

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[REDACTED]

MR. BROWN: [REDACTED]

MR. MILLER: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. MILLER: [REDACTED]

MR. TYSON: [REDACTED]

THE COURT: [REDACTED]

MR. RUSSO: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

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THE COURT: [REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. BROWN: [REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

MR. McGUIRE: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

MR. CROSS: [REDACTED]

(The proceedings were thereby concluded at 6:26 P.M.)

C E R T I F I C A T E

1
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3 UNITED STATES OF AMERICA
4 NORTHERN DISTRICT OF GEORGIA
5

6 I, SHANNON R. WELCH, RMR, CRR, Official Court Reporter of
7 the United States District Court, for the Northern District of
8 Georgia, Atlanta Division, do hereby certify that the foregoing
9 357 pages constitute a true transcript of proceedings had
10 before the said Court, held in the City of Atlanta, Georgia, in
11 the matter therein stated.

12 In testimony whereof, I hereunto set my hand on this, the
13 13th day of September, 2020.
14
15
16

17 *Shannon R. Welch*

18 _____
19 SHANNON R. WELCH, RMR, CRR
20 OFFICIAL COURT REPORTER
21 UNITED STATES DISTRICT COURT
22
23
24
25

UNITED STATES DISTRICT COURT
OFFICIAL CERTIFIED TRANSCRIPT

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

4 DONNA CURLING, ET AL., :
5 :
6 PLAINTIFFS, :
7 vs. : DOCKET NUMBER
8 : 1:17-CV-2989-AT
9 BRAD RAFFENSPERGER, ET AL., :
10 :
11 DEFENDANTS. :

12 **TRANSCRIPT OF HEARING ON PRELIMINARY INJUNCTION VIA ZOOM**
13 **PROCEEDINGS**

14 **BEFORE THE HONORABLE AMY TOTENBERG**

15 **UNITED STATES DISTRICT JUDGE**

16 **SEPTEMBER 14, 2020**

17 **9:32 A.M.**

18 **VOLUME 3**

19 **REDACTED**

20 **MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED**

21 **TRANSCRIPT PRODUCED BY:**

22 **OFFICIAL COURT REPORTER:** **SHANNON R. WELCH, RMR, CRR**
23 **2394 UNITED STATES COURTHOUSE**
24 **75 TED TURNER DRIVE, SOUTHWEST**
25 **ATLANTA, GEORGIA 30303**
(404) 215-1383

A P P E A R A N C E S O F C O U N S E L

**FOR THE PLAINTIFFS DONNA CURLING, DONNA PRICE, JEFFREY
SCHOENBERG:**

DAVID D. CROSS
VERONICA ASCARRUNZ
EILEEN BROGAN
MORRISON & FOERSTER, LLP

HALSEY G. KNAPP, JR.
ADAM M. SPARKS
KREVOLIN & HORST, LLC

**FOR THE PLAINTIFFS COALITION FOR GOOD GOVERNANCE, LAURA DIGGES,
WILLIAM DIGGES, III, AND RICARDO DAVIS:**

BRUCE BROWN
BRUCE P. BROWN LAW

ROBERT ALEXANDER MCGUIRE, III (VIA VIDEO CONFERENCE)
ROBERT MCGUIRE LAW FIRM

FOR THE STATE OF GEORGIA DEFENDANTS:

VINCENT ROBERT RUSSO, JR.
CAREY A. MILLER
ROBBINS ROSS ALLOY BELINFANTE LITTLEFIELD, LLC

BRYAN P. TYSON
BRYAN JACATOUT
DIANE LAROSS
LOREE ANNE PARADISE
TAYLOR ENGLISH DUMA

(...cont'd...)

1 (...cont'd....)

2

FOR THE FULTON COUNTY DEFENDANTS:

3

CHERYL RINGER
KAYE BURWELL
OFFICE OF THE FULTON COUNTY ATTORNEY

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I N D E X T O P R O C E E D I N G S

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P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; September 14, 2020.)

(The following proceedings were held in a private Zoom call with only authorized participants, as follows:)

THE COURT:

[REDACTED]

MR. CROSS:

[REDACTED]

THE COURT:

[REDACTED]

MR. BROWN:

[REDACTED]

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THE COURT: [REDACTED]

MR. BROWN: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. MILLER: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

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MR. MILLER: [REDACTED]

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THE COURT:

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

THE COURT:

[REDACTED]

MR. JACOUTOT:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. SPARKS:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

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[REDACTED]

MR. MAGUIRE: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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MR. TYSON: [REDACTED]

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MR. CROSS: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

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MR. TYSON: [REDACTED]

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THE COURT: [REDACTED]

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MR. TYSON: [REDACTED]

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THE COURT:

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THE COURT:

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[REDACTED]

MR. TYSON:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

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[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

DR. COOMER: [REDACTED]

THE COURT: [REDACTED]

DR. COOMER: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

DR. COOMER: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

DR. COOMER: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

DR. COOMER: [REDACTED]

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THE COURT:

[REDACTED]

[REDACTED]

DR. COOMER:

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

DR. COOMER:

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

DR. COOMER:

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

DR. COOMER:

[REDACTED]

THE COURT:

[REDACTED]

DR. COOMER:

[REDACTED]

THE COURT:

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DR. COOMER:

[REDACTED]

THE COURT:

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DR. HALDERMAN: [REDACTED]

THE COURT: [REDACTED]

MR. CROSS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MR. MILLER: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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THE COURT: [REDACTED]

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[REDACTED]

MR. MILLER:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

THE COURT:

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[REDACTED]

BY MS. ASCARRUNZ:

Q. [REDACTED]

A. [REDACTED]

Q. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

[REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

[REDACTED]

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A. [REDACTED]

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Q. [REDACTED]
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Q. [REDACTED]

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A. [REDACTED]

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Q. [REDACTED]

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Q. [REDACTED]

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Q. [REDACTED]

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Q. [REDACTED]

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Q. [REDACTED]

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A. [REDACTED]
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Q. [REDACTED]
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A. [REDACTED]
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[REDACTED]
[REDACTED]
[REDACTED]
Q. [REDACTED]
MS. ASCARRUNZ: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
MR. TYSON: [REDACTED]
[REDACTED]
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THE COURT:

[REDACTED]

[REDACTED]

Q. (BY MS. ASCARRUNZ)

[REDACTED]

[REDACTED]

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A.

[REDACTED]

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[REDACTED]

[REDACTED]

Q. [REDACTED]

A. [REDACTED]

THE COURT: [REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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Q. [REDACTED]

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A. [REDACTED]

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[REDACTED]

[REDACTED]

Q. [REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

THE WITNESS: [REDACTED]

THE COURT: [REDACTED]

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THE WITNESS: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

A. [REDACTED]

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[REDACTED]

Q. (BY MS. ASCARRUNZ)

[REDACTED]

THE COURT:

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

THE WITNESS:

[REDACTED]

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THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

COURT REPORTER:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE WITNESS:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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THE COURT:

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[REDACTED]

THE WITNESS: [REDACTED]

THE COURT: [REDACTED]

THE WITNESS: [REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

Q. [REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[Redacted text block containing multiple lines of blacked-out text]

Q.

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[REDACTED]

Q. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

Q. [REDACTED]

[REDACTED]

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A. [REDACTED]

Q. [REDACTED]

A. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Q. [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE WITNESS: [REDACTED]

THE COURT: [REDACTED]

THE WITNESS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

THE WITNESS: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

THE COURT: [REDACTED]

Q. (BY MS. ASCARRUNZ) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

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[Redacted text block containing multiple lines of blacked-out content, including question and answer markers.]

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[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

THE WITNESS:

[REDACTED]

[REDACTED]

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Q. (BY MS. ASCARRUNZ) [REDACTED]

[REDACTED]

[REDACTED]

A. [REDACTED]

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[REDACTED]

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[REDACTED]

Q. [REDACTED]

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[REDACTED]

[REDACTED]

A. [REDACTED]

Q. [REDACTED]

[REDACTED]

A. [REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

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[REDACTED]

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[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

[REDACTED]

MS. ASCARRUNZ: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE COURT: [REDACTED]

MR. TYSON: [REDACTED]

THE COURT: [REDACTED]

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MR. TYSON:

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

MR. TYSON:

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

MR. TYSON:

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

THE COURT:

[REDACTED]

THE COURT:

[REDACTED]

MS. ASCARRUNZ:

[REDACTED]

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THE COURT:

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MR. TYSON:

[REDACTED]

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THE COURT:

[REDACTED]

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MS. ASCARRUNZ:

[REDACTED]

Q. (BY MS. ASCARRUNZ)

[REDACTED]

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MS. ASCARRUNZ: [REDACTED]

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THE COURT:

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MR. TYSON:

[REDACTED]

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THE COURT:

[REDACTED]

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MR. McGUIRE:

[REDACTED]

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THE COURT:

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MR. TYSON:

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THE COURT:

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[REDACTED]

MR. TYSON: [REDACTED]

MR. BROWN: [REDACTED]

THE COURT: [REDACTED]

[REDACTED]

LAW CLERK COLE: [REDACTED]

THE COURT: [REDACTED]

MR. TYSON: [REDACTED]

[REDACTED]

THE COURT: [REDACTED]

[REDACTED]

BY MR. TYSON:

Q. [REDACTED]

[REDACTED]

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THE COURT: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

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THE WITNESS: [REDACTED]

[REDACTED]

MR. TYSON: [REDACTED]

Q. (BY MR. TYSON) [REDACTED]

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Q. [REDACTED]

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MR. TYSON:

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Q. (BY MR. TYSON) [REDACTED]

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MR. TYSON:

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A. [REDACTED]

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Q. [REDACTED]

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Q. [REDACTED]

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A. [REDACTED]

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MR. TYSON:

[REDACTED]

[REDACTED]

THE COURT:

[REDACTED]

[REDACTED]

MR. TYSON:

[REDACTED]

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THE COURT:

[REDACTED]

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MR. TYSON:

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Q. (BY MR. TYSON)

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MR. TYSON:

Q. (BY MR. TYSON)

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MR. TYSON:

[REDACTED]

Q. (BY MR. TYSON)

[REDACTED]

THE COURT:

[REDACTED]

MR. TYSON:

[REDACTED]

THE COURT:

[REDACTED]

Q. (BY MR. TYSON)

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MR. CROSS: [REDACTED]

THE COURT: [REDACTED]

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BY THE COURT:

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THE COURT: [REDACTED]

THE WITNESS: [REDACTED]

THE COURT: [REDACTED]

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MS. ASCARRUNZ: [REDACTED]

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THE COURT: [REDACTED]

MS. ASCARRUNZ: [REDACTED]

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THE WITNESS: [REDACTED]

MR. McGUIRE: [REDACTED]

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THE COURT: [REDACTED]

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BY MR. MCGUIRE:

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THE COURT: [REDACTED]

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MR. TYSON: [REDACTED]

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THE COURT: [REDACTED]

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MR. TYSON: [REDACTED]

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DR. COOMER: [REDACTED]

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THE COURT: [REDACTED]

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MR. McGUIRE:

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THE COURT:

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LAW CLERK COLE:

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MR. McGUIRE:

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LAW CLERK COLE:

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MR. McGUIRE:

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LAW CLERK COLE:

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THE COURT: [REDACTED]

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MR. McGUIRE:

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THE WITNESS:

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THE COURT:

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MR. TYSON:

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MR. CROSS:

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THE COURT:

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THE COURT: [REDACTED]

**(The private Zoom proceedings were thereby
concluded at 12:34 P.M., and the Zoom meeting
open to the public continued, as follows:)**

THE COURT: Is Mr. Skoglund still -- are we going to
continue with his testimony?

MR. McGUIRE: Yes, Your Honor. We do have a few
exhibits for him.

THE COURT: All right. How many more, Ms. Cole, do
you have to admit?

LAW CLERK COLE: I just have four people in the
waiting room right now.

THE COURT: All right. Well, go ahead and admit them
or whatever you are going to do. And then we will begin and
get the exhibits up.

LAW CLERK COLE: Mr. McGuire, what are the pictures
you are going to use?

MR. McGUIRE: It will be PD 20, PD 19, and then

1 potentially -- well, that will be it for Mr. Skoglund.

2 THE COURT: Who is Diabolic Empress? Okay. Thank
3 you. I don't want to have another experience here.

4 I think we have everyone here -- counsel and the
5 witness.

6 And is Mr. Skoglund going to continue his testimony
7 now that is the public portion of his testimony?

8 MR. MCGUIRE: Yes, Your Honor.

9 Mr. Bruce Brown had a motion I believe he wanted to
10 make. I think he is muted.

11 THE COURT: Mr. Brown -- let's see. Ms. Cole, did
12 you de-mute?

13 MR. BROWN: Thank you, Your Honor. Thank you,
14 Ms. Cole.

15 The Coalition plaintiffs at the appropriate time will
16 be filing a motion to unseal the portion of the sealed
17 testimony that is not confidential. We will also be taking the
18 position that the demonstration of Dr. Halderman also should be
19 unsealed. We completely understand the logistical imperatives
20 that Your Honor has been grappling with. And I believe that a
21 motion would be the best vehicle for allowing the parties,
22 including the State, to present the arguments and to be very
23 specific of what portions of the testimony should be unsealed
24 and for Your Honor to consider those in due course.

25 Thank you.

1 THE COURT: That is fine. Thank you.

2 MR. McGUIRE: Mr. Skoglund, I believe you are muted,
3 and I don't see your video.

4 LAW CLERK COLE: It is taking a moment for --

5 COURT REPORTER: I believe we have some members of
6 the public with video up. If counsel of record could just have
7 video up.

8 THE COURT: I think we're okay. We have pictures
9 but --

10 All right. Great. We have our witness back. Hello,
11 Mr. Skoglund.

12 MR. McGUIRE: May I proceed?

13 THE COURT: Yes.

14 DIRECT EXAMINATION (Continued)

15 BY MR. MCGUIRE:

16 Q. Mr. Skoglund, I would like to ask you about logic and
17 accuracy.

18 MR. McGUIRE: And so I would like to ask Holly --

19 THE COURT: Would you just -- for purposes of the
20 public, let's just go ahead and just have the witness identify
21 again.

22 You are still under oath, Mr. Skoglund. Would you
23 just go ahead again and identify yourself, where you are
24 located, and what your -- basically what the scope of your
25 expertise and position are.

1 THE WITNESS: Yes. My name is Kevin Skoglund,
2 S-K-O-G-L-U-N-D. I reside in Wynnewood, Pennsylvania, just
3 outside of Philadelphia, which is where I'm calling from today.
4 I'm testifying as a cybersecurity and electronic voting expert
5 in this case.

6 THE COURT: And what is the nature of your business
7 and background, just as background?

8 THE WITNESS: Yes. My background is diverse. It
9 includes programming, teaching, cybersecurity consulting, and
10 advising on election technology.

11 THE COURT: Thank you.

12 **Q. (BY MR. McGUIRE)** So thank you, Mr. Skoglund.

13 You are familiar with logic and accuracy?

14 **A.** Yes, I am.

15 **Q.** What is the purpose of pre-election logic and accuracy
16 testing?

17 **A.** The purpose of any testing is to try and answer a
18 question, to try and, you know, find out if something is true
19 or not.

20 And so for logic and accuracy testing, different counties
21 perform it different ways, different states perform it
22 different ways depending on what question they want to answer.
23 So it really depends on what the scope of what you want to look
24 at.

25 If you look at a single contest, then you verify that that

1 single contest is working correctly. If you look at a single
2 piece of equipment and test that, then you verify that that
3 single piece of equipment is working correctly. If you test --
4 if you test everything that is on a ballot, then you can test
5 that the ballot is working correctly.

6 **Q.** And do you have a view of what constitutes adequate logic
7 and accuracy of equipment such as a ballot-marking device?

8 MR. TYSON: Your Honor, I'll object here that we
9 haven't admitted Mr. Skoglund as an expert on election
10 administration to have an opinion on what is adequate. I think
11 Mr. McGuire can lay the foundation for that. I don't think it
12 has been laid so far.

13 MR. McGUIRE: Your Honor, we have already tendered
14 him as an expert in voting -- electronic voting security. And
15 logic and accuracy testing is an inherent part of voting
16 security.

17 We can certainly lay more foundation if the State
18 wants, but I think he is already qualified.

19 THE COURT: All right. Why don't you just briefly do
20 so. I think he is. But go ahead basically to do so.

21 **Q. (BY MR. McGUIRE)** So, Mr. Skoglund, let's go back. I
22 think some of the ground that we covered yesterday might be
23 informative here.

24 Can you tell the Court more about your experience in
25 regard to voting technology?

1 **A.** So I have advised a number of different groups about their
2 voting technology and the selections that they are making,
3 including states and counties, the City of New York. And I
4 have made -- I have done studies, analysis of the voting
5 purchases that different counties make and comparing the
6 features of those systems.

7 I'm not sure if there is something more specific you want
8 me to go into. It is a long list.

9 THE COURT: And is logic and accuracy a capacity of
10 the systems and how it functions in the logic and accuracy part
11 of that?

12 THE WITNESS: Logic and accuracy -- I think the State
13 is right. It is a point where election administration
14 interfaces with election technology. But there definitely are
15 things that I can speak to about the election technology side
16 of that, you know, what is required to make sure that the
17 technology is functioning correctly.

18 THE COURT: Okay.

19 MR. McGUIRE: Your Honor, do I need to go further or
20 can I ask --

21 THE COURT: No. If there is something you want to
22 wrap up, that is fine but --

23 MR. McGUIRE: Yeah.

24 **Q.** **(BY MR. McGUIRE)** So I just wanted to talk to you,
25 Mr. Skoglund, about -- I would like to put up Exhibit PD 20.

1 Mr. Skoglund, I'm going to represent to you that this is
2 the Georgia statute that pertains to testing pre-election
3 testing and voting equipment.

4 And if we could please scroll down to the highlighted
5 portion in Subsection C.

6 Mr. Skoglund, it says there on or before the third day
7 preceding a primary or election, including special primaries,
8 special elections, and referendum elections, the superintendent
9 shall have each electronic ballot marker tested to ascertain
10 that it will correctly record the votes cast for all offices on
11 all questions and produce a ballot reflecting such choices of
12 the elector in a manner that the State Election Board shall
13 prescribe by rule or regulation.

14 Did I read that correctly?

15 **A.** Yes, you did.

16 **Q.** What does that mean to you as a cyber -- as a security
17 person?

18 **A.** This is essentially the description of what the logic and
19 accuracy test ought to be to ensure that the technology is
20 functioning correctly.

21 **Q.** And so when you say this is what it should be, what
22 particular aspects of this are you focused on to arrive at that
23 conclusion?

24 MR. TYSON: I'll object to the extent this calls for
25 a legal conclusion. But I believe Mr. Skoglund can answer

1 based on his personal understanding of it.

2 MR. McGUIRE: I'm just asking, Your Honor, as a
3 security person what does he -- which aspects of this does he
4 feel are sufficient because he just said it was sufficient.

5 THE COURT: Okay. Proceed.

6 **A.** The keywords that jump out to me there are the -- in the
7 second line of it where it says each electronic ballot marker
8 and then in the following line when it says record the cast
9 votes for all offices and all questions. To me, that is a good
10 comprehensive way to define the scope of what we're testing,
11 the question that we're asking when we perform logic and
12 accuracy testing.

13 We're going to be testing every BMD for every office and
14 every question that is tested will correctly record the votes
15 and produce the ballot.

16 MR. McGUIRE: Thank you.

17 And we can take that exhibit down. If we could put
18 up PD 19, please.

19 **Q. (BY MR. McGUIRE)** Now, Mr. Skoglund, I'm showing you PD
20 19, which is the document that is already in the record. It is
21 Document 809-4, Page 25. If we could scroll down so that
22 Section D is visible in the frame.

23 Mr. Skoglund, have you seen this document before?

24 **A.** I have.

25 **Q.** What is your -- what is this document?

1 **A.** This document is what I believe is the guidance from the
2 State of Georgia or from the State Election Board to how the
3 BMDs and printers should have their logic and accuracy testing
4 performed.

5 **Q.** And this Section D deals specifically with the BMD and
6 printer. Can you take a quick look at that and tell us in your
7 view is that equally adequate as the statute that we just
8 looked at?

9 **A.** No, I don't think that it is adequate.

10 **Q.** Why not?

11 **A.** Because it doesn't test -- it doesn't follow what was just
12 in the previous statute that we looked at. It is not testing
13 every machine and every what we call ballot position. Instead,
14 it says that it is acceptable to just test some of those on
15 some of the BMDs and not other ones on other BMDs.

16 And it notes there at the very bottom all unique ballot
17 styles do not have to be tested on each of the BMDs, which I
18 think is not correct.

19 **Q.** Okay. When you say not --

20 THE COURT: Go ahead.

21 MR. McGUIRE: I'm sorry, Your Honor.

22 **Q.** **(BY MR. McGUIRE)** When you say not correct, what do you
23 mean exactly? Do you mean not consistent with the law, or do
24 you mean it is not adequate? What do you mean?

25 **A.** Both actually. I should clarify. Yes, it is both. I

1 think it doesn't -- it does not match my understanding of what
2 the statute was that we just looked at. And it also is, again,
3 defining the scope of testing such that we are not asking all
4 the questions to all the machines all the time.

5 **Q.** And if this is the -- if this is the procedure which BMDs
6 and their printers are actually tested under, do you have an
7 opinion on the significance of the difference between this
8 procedure and what the statute requires for purposes of the
9 security of the system?

10 MR. TYSON: I'll object to the extent this assumes
11 that there is a distinction between those two, but I understand
12 Mr. McGuire's question.

13 THE COURT: Go ahead and proceed.

14 **A.** I'm sorry. Could you ask the question again.

15 **Q. (BY MR. MCGUIRE)** Yeah. I may not be able to ask it in
16 exactly the same words. But, you know, to the extent that you
17 understand this procedure that we're looking at, this D,
18 testing of the BMD and printer, do you have an opinion on the
19 significance of the departure between this document, these
20 procedures, and what you understood the statute to require?
21 Does it matter?

22 MR. TYSON: (Unintelligible). Sorry.

23 **A.** Yes, I think it does matter. Not just in a legal sense.
24 But in a technical sense, I think it matters. And there is a
25 good recent example of that. In Northhampton County,

1 Pennsylvania, where I reside -- in the state I reside, in
2 November of last year, there was some poor configuration of the
3 ballot-marking devices that is a ballot marker and tabulator
4 all in one. And the configuration problem -- the systems were
5 not adequately logic and accuracy tested. So those
6 configuration problems weren't caught. And the result is that
7 there were some contests on election night that had correct
8 tallies and other contests where the candidate that was
9 eventually the winner got zero votes.

10 And so not only was it, you know, a big fiasco to sort of
11 sort out, but the public's trust in the election was really
12 damaged. Thankfully this failure was on a machine with paper
13 and the error was on the side of the tabulation of that paper.
14 So the paper could be rescanned.

15 But if the error had been in the ballot-printing portion,
16 as Dr. Stark has testified about is a concern, it would not
17 have been able to correct those results.

18 **Q. (BY MR. McGUIRE)** And by that, you mean using this
19 procedure versus the one in the statute?

20 **A.** That's right. If you don't catch the problems in the BMD
21 and ask yourself if every BMD is operating properly, then you
22 open yourself up to having results that you can't detect are
23 wrong.

24 **Q.** The example you just gave in Northhampton, Pennsylvania,
25 was of a misconfiguration of the BMDs. Would your conclusion

1 hold true in the event of intentional malware attack that had
2 altered the functioning of one or more BMDs?

3 **A.** Yes, it would. There is no real distinction between
4 manipulation, you know, or malfunction. There is an intention
5 is the difference. But the machine is not acting according to
6 its specifications. It is not doing what it is supposed to,
7 which is what logic and accuracy testing is designed to test.

8 **Q.** Okay. So I asked you about the changes to central count
9 scanner settings that the plaintiffs have proposed.

10 You heard Dr. Coomer and Mr. Harvey suggest on Friday that
11 changing scanner settings might implicate EAC certification,
12 did you?

13 **A.** I heard them say that.

14 **Q.** Okay. Do you agree with their testimony on that point?

15 **A.** No, I do not.

16 **Q.** Why not?

17 **A.** The EAC certification doesn't reference specific settings,
18 such as color and gray scale and dots per inch. So when
19 Democracy Suite 5.5-A is certified, it is certified for all
20 available settings. And the scanner documentation shows that
21 these settings are available.

22 **Q.** So the EAC certification does not specify the DPI setting
23 required for central count scanners?

24 **A.** It does not.

25 **Q.** Okay. And are you aware -- and it doesn't specify that

1 central count scanners have to be set to scan only in black and
2 white?

3 **A.** That is correct. On the dots per inch, I would also add
4 my understanding from the previous testimony is that it is
5 actually different on different machines, the central count
6 scanner and the precinct scanners. So it is already different.

7 **Q.** Are you aware of anything in the EAC test plan or the
8 certifications or approvals of 5.5-A or to the extent you know
9 5.5-A (GA) that would preclude Georgia from adjusting the
10 settings of the Dominion central count scanners?

11 **A.** I do not.

12 **Q.** In your opinion, would an order from this Court that
13 requires changes to those scanner settings void or violate any
14 current certification or approval from the EAC?

15 **A.** No, I don't think it would.

16 **Q.** Okay. Finally, I want to switch gears and ask you about
17 the plaintiffs' request for BMDs not to be used and instead for
18 paper ballots to be used for in-person voting.

19 I understand from your declaration in October of 2019 in
20 this case that you are a judge of election in Montgomery
21 County, Pennsylvania, and that the polling place you oversee
22 uses a voting system manufactured by Dominion and configured
23 for hand-marked paper ballots; is that true?

24 **A.** That is correct. We use Democracy Suite 5.5-A, the same
25 system.

1 Q. So, first of all, what is a judge of elections in
2 Pennsylvania?

3 A. I'm not sure what the term is in Georgia. It is the head
4 poll worker, the person who runs the poll placing and performs
5 sort of the highest level tasks in the polling place.

6 Q. So the hardware and software that you use in Pennsylvania,
7 how similar is it to what the plaintiffs are proposing should
8 be used here in Georgia?

9 A. It is the same suite of software. We use the -- what I
10 understand to be the same hardware as well. We have the
11 ImageCast X BMD with the external printer, as you have seen
12 before, and the ImageCast precinct scanner.

13 The difference is in the way that we deploy those. We
14 only deploy one scanner and one ballot-marking device per
15 polling place rather than many of the ballot-marking devices.

16 Q. And the rest of the voters vote how?

17 A. They vote -- the voters who don't use the ImageCast X BMD
18 vote by hand-marked paper ballot. That is the majority of
19 voters. In fact, in the last two elections, I think it has
20 been all but one voter who voted by hand-marking a ballot.

21 Q. And you heard Mr. Barron's testimony that using
22 hand-marked paper ballots on election day would not -- would be
23 possible for Fulton County?

24 A. Yes, I did.

25 Q. Does your experience in Pennsylvania support that

1 conclusion by him?

2 **A.** Absolutely. It works very well for us. We have been very
3 happy with the system.

4 **Q.** Now, you also heard him testify that early voting might be
5 a concern for Fulton County, did you not?

6 **A.** I did.

7 **Q.** Do you have any reason -- well, first of all, do you have
8 early voting in Pennsylvania?

9 **A.** We don't have early voting in Pennsylvania.

10 **Q.** Okay. So do you have reason to disagree with Mr. Barron's
11 apprehension about conducting early voting without BMDs?

12 **A.** No. I think that it is very feasible. I mentioned before
13 that I have provided some testimony to the New York City
14 council. That was actually specifically on this question.

15 New York City had implemented early voting, and they were
16 trying to figure out how they were going to do that
17 logistically and from a technology perspective. So I was
18 invited to speak and to talk about my recommendations to the
19 city council.

20 And I recommended to them -- they were trying to decide
21 between rolling out ballot-marking devices for everyone, which
22 is what some people were pushing for, versus other solutions.
23 I recommended other solutions being a ballot-on-demand
24 printing. That is ultimately what New York City ended up
25 adopting. And my understanding is that worked very

1 successfully and they are going to continue using it.

2 The idea is just that at each early voting location you
3 have a printer that can print a ballot on demand. And the
4 solution that they went with is one made by KNOWiNK, the
5 pollbook company that, I believe, Georgia uses as well. And it
6 is called Poll Print. It directly interfaces with the pollbook
7 so that when the voter checks in their ballot style is pulled
8 up by the pollbook and the ballot instantly prints and it is
9 handed to the voter for them to go then take and hand-mark. So
10 it is sort of a just-in-time printing.

11 **Q.** So in that situation as I understand it, you are saying
12 that the early vote center would stockpile some ballots but it
13 would print most of them?

14 **A.** I think that their solution is to print them all
15 immediately. I'm not positive on that. But I had actually
16 recommended to them that they didn't have to do immediate
17 printing, that they also could stockpile a sort of reservoir of
18 each ballot style. So maybe 20 to 50 ballots of each style and
19 then you pull the appropriate, you know, ballot style for each
20 voter. Then you can use a ballot-on-demand printer to
21 replenish those reservoirs of ballots as they were given out.

22 **Q.** Okay. So in your supplemental declaration, which for the
23 record is Document 680-1 at Page 29 -- I'm going to point
24 specifically to Paragraph 11 -- you said that hand-marked paper
25 ballot systems have shorter lines due to the rate in which a

1 series of voters can move through the polling place.

2 Have you observed this to be true in jurisdictions you are
3 familiar with?

4 **A.** Yes. I think I have seen in my experience and I have read
5 studies that show that it is true. The reason why -- in my
6 county before we switched systems, we had DREs. And my polling
7 place had two DREs, which meant that two voters could vote at a
8 time. And that was the total throughput of the polling place.
9 Only two voters could cast their vote at any time.

10 And if you had a particularly long ballot, it would take a
11 long time for voters to make up their mind in the booth. But
12 under the new system, when voters come into the poll, then we
13 give them their ballot. They go to privacy stations to do the
14 time-consuming part, to mark their ballot. In my polling
15 place, we have seven to eight places for them to do that that
16 are designated already. It is a combination of standup
17 cardboard lecterns that people can mark their ballot at and
18 also some tabletop privacy screens that are just very
19 inexpensive plastic dividers.

20 And there's actually a couple of others that are in supply
21 that we can set up if we need more and they provide clipboards
22 if we needed any more. So that means that the throughput in
23 our system now is much larger. It gives you potentially seven
24 or eight voters who can vote at any one time instead of two.
25 And that is the time-consuming part.

1 The process of scanning on the ImageCast precinct is very
2 quick. So you can just feed your ballot in and then go on
3 your --

4 **Q.** So from the voter's perspective in your experience, what
5 is -- is there a benefit to using hand-marked paper ballots
6 versus BMDs?

7 **A.** Definitely. There are a lot of -- a lot of them. One of
8 them comes from that long line thing. I always have really
9 liked the fact that voters who may need more time with their
10 ballots, either to make decisions or maybe they have literacy
11 challenges or language challenges -- they can take their time
12 and not feel the pressure of a line building behind them.
13 Where with the old system, you know, those voters had people
14 behind them, you know, waiting and wanting them to hurry up,
15 you know, visibly agitated. Whereas, now you can sit and take
16 your time. And a slow voter and a fast voter can be voting
17 side by side. Several fast voters can move through the process
18 without the slow voter holding things up.

19 **Q.** Are you aware of any research that bears on this question
20 of voter delay when using paper ballots versus electronic
21 voting?

22 **A.** I am. There's two papers that come to mind. One is there
23 is a paper that is coauthored by Charles Stewart from MIT. He
24 is someone who I really admire. He takes a very data-driven
25 approach to looking at election problems. And he looked at

1 this issue and found that waiting times are uneven across the
2 country, found that a lot of the problems are in sort of the
3 southeastern states with long lines, and concludes that those
4 lines have an effect on voter trust of the system.

5 He determined that if you wait in line you are more likely
6 to not trust your election and also that you are not as likely
7 to trust the elections of other people in other places as well.
8 So it has an overall diminishing effect on voter trust.

9 **Q.** And you said that was one of the studies. Was there
10 another?

11 **A.** Yes. The other study is looking at Maryland elections and
12 using data and computer simulations to compare the wait times
13 between touch screen DREs and hand-marked paper ballots. And I
14 found that the DREs are a limiting resource in the way that I
15 just described, that they provide a bottleneck, especially if
16 the ballot is really long.

17 They actually come up with a formula for determining, you
18 know, how many screens you would need to handle the capacity
19 and conclude that the hand-marked paper ballots are a better
20 solution because they have more, you know, throughput capacity.

21 **Q.** Okay. I would like to show you PX 61 and then PX 62 and
22 have you confirm whether those are the studies you are talking
23 about.

24 This one would be PX 61, I believe. And that is -- is
25 that one of the studies you were talking about? Or maybe you

1 could scroll down. It says waiting to vote there.

2 **A.** Can you scroll down -- is that possible? -- to the next
3 page? Sorry. Yes, that is the one.

4 **Q.** This is the Stewart paper you referred to?

5 **A.** That's correct.

6 MR. MCGUIRE: Okay. Great. I would move to admit
7 this one, Your Honor, PX 61, and I would like to show you PX 62
8 next.

9 MR. TYSON: Your Honor, we'll object as hearsay.
10 Mr. Skoglund hasn't been participating in the study. He read
11 the study, and he liked it. That is the whole basis of it
12 coming in. I don't see that there is any relevance here.
13 There is no policy discussion, not what different things can be
14 done. But it is not relevant to the claims before the Court.

15 MR. MCGUIRE: Perhaps I could ask another question or
16 two then of Mr. Skoglund.

17 **Q. (BY MR. MCGUIRE)** Mr. Skoglund, are these studies the
18 kinds of things that you would rely upon to form your opinions
19 as an expert?

20 **A.** I would rely upon it. I have relied upon them.

21 **Q.** So in terms of the opinions you are expressing here today,
22 are these two studies -- these underlie those opinions?

23 **A.** Yes, they do.

24 MR. MCGUIRE: Okay. Based on that, Your Honor, I
25 mean, he has already testified to the underlying stuff. I

1 don't know why it would be objectionable to admit it as
2 foundation for what his opinions were.

3 MR. TYSON: Again, Your Honor --

4 THE COURT: Fine. I'll just take it under
5 advisement.

6 Thank you. Go ahead.

7 **Q. (BY MR. McGUIRE)** The other one is PX 62. Is that the
8 other study you were referring to?

9 **A.** Yes, it is.

10 MR. McGUIRE: And similarly I would move for that one
11 to be admitted as well.

12 MR. TYSON: Same objection, Your Honor.

13 THE COURT: All right.

14 **Q. (BY MR. McGUIRE)** Mr. Skoglund, just to wrap up this
15 section, so in your opinion do you have an opinion --

16 THE COURT: I'm sorry. Would you just mind reading
17 into the record the name of each study and the authors and
18 their affiliation.

19 MR. McGUIRE: Certainly, Your Honor. I can do that.
20 P -- I'm sorry. Let me pull it up. 62 -- PX 61, the authors
21 are Charles Stewart and Stephen Ansolabehere, and the title is
22 Waiting to Vote. It is from the Election Law Journal: Rules,
23 Politics, and Policy dated 2015.

24 THE COURT: Its affiliation?

25 MR. McGUIRE: I'm sorry. It is -- I'm sorry. It was

1 from MIT open access articles. It is from the MIT faculty.

2 THE COURT: Okay.

3 MR. McGUIRE: The second article, PX 62, is from
4 proceedings of the 2010 electronic voting technology workshop,
5 the workshop on trustworthy elections in Washington, D.C. on
6 August 9 and 10, 2010. The title is, Queuing and Elections:
7 Long Lines, DREs, Paper Ballots. That is by William Edelstein
8 and Arthur Edelstein.

9 THE COURT: And that's Johns Hopkins University and
10 the Mr. Edelstein from the University of California in San
11 Francisco.

12 I just want in the record for it to be properly
13 referenced. Before I let them in, I'll have to take a look.

14 **Q. (BY MR. McGUIRE)** Mr. Skoglund, just to clarify one point,
15 that one article in its title referred to DREs. And we have
16 been talking about BMDs today.

17 Does that make a difference?

18 **A.** No. Because the key point of those is about providing a
19 voting resource. Right? So each one is still a resource. If
20 you have two or three or four in a polling place, that is the
21 limit of that resource.

22 And if anything, ballot-marking devices take more time
23 because there is that extra process of printing a piece of
24 paper, which hopefully voters are going to spend time looking
25 at, even if the evidence is thin that they do.

1 **Q.** So, Mr. Skoglund, based on your own experience and based
2 on what you have observed in the New York City council, do you
3 have an opinion on whether a large Georgia county like Fulton
4 could feasibly implement hand-marked paper ballot voting during
5 early voting and on election day in the time left between now
6 and when voting starts?

7 **A.** Absolutely. I mean, for hand-marked voting, that is done
8 in large cities and large counties across the nation, so, you
9 know, Boston and New York City as we mentioned. Same for early
10 voting.

11 In my personal county, we have about 75 percent, I think,
12 the size of Fulton County. I'm sort of doing rough math there.
13 But I think that is about right. We had no problems moving to
14 it.

15 **Q.** So to wrap all this up, in your expert opinion, is
16 Georgia's voting system secure?

17 **A.** You know, this question has come up a couple of times from
18 other experts as well. And in my line of work, we don't think
19 of it as being secure or insecure. And we don't try to measure
20 the distance the system is from either one of those and that is
21 because we can't predict the future.

22 Vincent Liu when he testified talked about some of the
23 engagements he's been on where they didn't find anything. But
24 he could have been an hour and a few key strokes away from
25 finding a big problem. Instead, because we can't predict the

1 future, instead we engage in something called threat modeling
2 where we try to look at the potential problems that could
3 happen and then measure the risks of those problems.

4 And the way we measure risks is with two things: The
5 likelihood of something happening and the impact if it does
6 happen. And looking at those and measuring those allows us to
7 then weigh our need to do something versus the risk involved
8 with it, to weigh competing options, and also to prioritize,
9 you know, where our biggest concerns are so that we can add
10 mitigation, which is a word just for -- you know, for lessening
11 the risks.

12 When you go on vacation, you -- you lock yours doors and
13 leave on some lights and hold the mail. Those are just
14 mitigations for you not being robbed. It doesn't mean you
15 won't be robbed while you are away. But they make the
16 likelihood less.

17 And we look for ways to build in resilience to a system.
18 A good example of that is like a power generator. If the power
19 in your house goes out, you can lessen the impact of it by
20 having a backup generator.

21 **Q.** And how would you regard Georgia's current BMD voting
22 system using the methodology you just described?

23 **MR. TYSON:** Your Honor, I'll object to this line of
24 questioning as beyond the scope of Mr. Skoglund's expertise.
25 This is now about threat modeling, risk assessments. I don't

1 think we have had any indications of the expertise of
2 Mr. Skoglund in those areas.

3 MR. McGUIRE: Your Honor, he has been all but
4 qualified as an expert in cybersecurity. And this is right
5 down the middle of that.

6 THE COURT: I'll permit it.

7 **Q. (BY MR. McGUIRE)** Again, my question, Mr. Skoglund, is:
8 How would you regard Georgia's current BMD voting system using
9 the methodology that you just described?

10 **A.** The methodology said that we would first look at the
11 threats. And those threats are not just threats of hacking by
12 foreign actors. But it is everything from machine failures to
13 long lines to running out of emergency paper ballots, power
14 outages, pandemics as we have now seen.

15 So as I understand the plaintiffs' concerns in this case,
16 a lot of those are the risks that they see in the voting
17 system, the risk of not counting votes, returning outcomes that
18 don't reflect what the voters intended, long lines, Poll Pad
19 failures. Those are what I see as the risks.

20 And we can't predict whether any of those will happen or
21 not because we can't see the future. But we can measure the
22 likelihood and the impact if they do. That is what
23 cybersecurity would do is look at the likelihood and the
24 impact.

25 And I think there has been evidence that the risks have a

1 high likelihood and a significant impact. So we would then
2 seek to mitigate those risks to try and prioritize them and,
3 you know, to lessen the impact of them by either, you know,
4 putting new measures in place or adding resilience to the
5 system so that we could recover from problems if they did
6 happen.

7 So to answer your question, I think that the current risk
8 level in Georgia's voting system is high. And I think that
9 mitigations are warranted.

10 MR. McGUIRE: Thank you. I have nothing further on
11 direct, Your Honor.

12 THE COURT: Thank you. Does the State wish to pursue
13 any questions?

14 MR. TYSON: Yes, Your Honor. Just a few.

15 CROSS-EXAMINATION

16 BY MR. TYSON:

17 **Q.** Yes. Good afternoon again, Mr. Skoglund.

18 Mr. Skoglund, I want to ask first: If nothing changes in
19 Georgia's election system, can Georgians have confidence in the
20 outcome of the 2020 elections?

21 **A.** It goes back to what I just answered in my last question.
22 It is not a yes-or-no answer. I think that we can't predict
23 the future in the same way you can't predict if your house is
24 going to be robbed. All we can do is lessen the risk.

25 So, you know, I can't predict what will happen and no one

1 else can. I think that we have seen that the threats are very
2 high and very prevalent. I think there is plenty of evidence
3 of that, plenty of reason to be concerned, and therefore reason
4 to take steps to mitigate that.

5 But I don't think we can form an opinion about it is
6 secure or is it not secure. I just don't think that is a
7 useful question.

8 **Q.** Have you ever designed a logic and accuracy testing
9 process for any voting system?

10 **A.** I have not designed one. I have made recommendations
11 about how they should be designed.

12 **Q.** Have you ever conducted a logic and accuracy testing
13 regime for any election system?

14 **A.** I have never held that position, no.

15 **Q.** And when you mentioned BMDs in Pennsylvania that had the
16 configuration errors, those were not Dominion BMDs; correct?

17 **A.** They were not.

18 **Q.** You mentioned that you testified to New York City
19 regarding the implementation of early voting.

20 Do you recall that testimony?

21 **A.** That's correct.

22 **Q.** What time line was New York City able to utilize to
23 implement early voting?

24 **A.** I don't know the exact time line. I know that in 2018, I
25 believe, is when the legislation was passed to permit it. I

1 spoke in April of 2019, and they had not made a decision and,
2 you know, did not make one, I know, for a couple of months at
3 least afterwards. I don't know exactly when.

4 But they did end up making a decision between the time
5 that I testified and November. I don't know the exact dates.

6 **Q.** And is it your testimony that there is sufficient time in
7 Georgia to design a complete paper ballot early voting system
8 in the 28 days between today and when early voting begins?

9 **A.** I'm not an expert on election administration. So I
10 wouldn't want to try to characterize that. But I know that --
11 yeah. I'll leave it at that.

12 **Q.** And you indicated that a solution can be printing ballots
13 at an early voting site on the spot; correct?

14 **A.** Correct. That is what my understanding is New York City
15 is doing with the KNOWiNK Poll Print.

16 **Q.** Do you recall Mr. Harvey's testimony that there is one,
17 maybe a couple of more ballot printing -- ballot-on-demand
18 printers in each county?

19 **A.** You mean that the counties already own one in their
20 offices?

21 **Q.** Yeah.

22 **A.** That is correct. That is very common for many election
23 offices that they have one, you know, in the office that they
24 can use to print ballots in a pinch.

25 **Q.** And you heard Mr. Barron's testimony that there will be at

1 least, I believe it was, 33 early voting sites in Fulton
2 County?

3 **A.** Yes, I did.

4 **Q.** And so that would require a significant number of
5 purchases in addition to the setup to even think about that
6 kind of operation; right?

7 **A.** It would require new purchases. Yeah. In New York City,
8 I think they had 60, 65, somewhere in that range early voting
9 sites. So yes, you would need to make new purchases.

10 **Q.** And you testified about line length, and you said that the
11 number of stations or the equipment was relevant to that?

12 **A.** Correct.

13 **Q.** And do you know what the allocation of BMDs per voter for
14 each precinct in Georgia is?

15 **A.** I heard it at one point. If you were to tell it to me, I
16 could refresh my memory. I want to say it was in the 300s.
17 But I don't recall.

18 **Q.** Well, what I really want to ask is: You didn't take that
19 into account in forming opinions about the -- you didn't take
20 into account Georgia's allocation of resources when forming
21 your opinions about the number of voting stations and
22 line length in Georgia; correct?

23 **A.** No. My testimony was about generally a comparison between
24 the two. And the study, you know, that I cited was about
25 looking specifically at Maryland.

1 Q. And you agree that the throughput, as you referred to it,
2 is based on the allocation of equipment; correct?

3 A. Correct. That is the limiting constraint resource. You
4 can only have that many voters voting at that -- at that time.
5 If a machine goes down for any reason or if the activation
6 cards stops working, then that number gets reduced.

7 MR. TYSON: Thank you, Mr. Skoglund. I don't have
8 any further questions.

9 THE COURT: Anything occasioned by that?

10 MR. McGUIRE: I'm sorry?

11 THE COURT: This is just -- Mr. McGuire, did you have
12 anything else?

13 MR. McGUIRE: No, nothing on redirect. No, Your
14 Honor.

15 THE COURT: All right. Would you wait a minute and
16 let me just see whether I have any questions.

17 THE WITNESS: Absolutely. Thank you.

18 THE COURT: Could you bring up the logic and accuracy
19 testing document again? I don't know what that document is.

20 MR. McGUIRE: PD 19.

21 EXAMINATION

22 BY THE COURT:

23 Q. Mr. Skoglund, what is the -- based on your own programming
24 and experience in cybersecurity, what is the role of logic and
25 accuracy testing just looking at the big picture?

1 **A.** I mean, what you ultimately are trying to find out is do
2 we have belief that every piece of equipment is going to
3 operate properly and record votes properly on election day.
4 And so we're crafting a set of questions to ask in advance to
5 try and ascertain if that is true.

6 So I would say you would want to test every machine
7 because you want them all to work properly. You want to test
8 every ballot style because you want every ballot style to work
9 properly. And you want to check every contest. At a minimum,
10 you want to make sure that every candidate is able to receive a
11 vote; that if you were to put a vote -- let's say a contest
12 between George Washington and Thomas Jefferson -- a vote for
13 George Washington should be able to be marked and observed to
14 be correct and it should be able to go through the tabulator
15 when you do the logic and accuracy testing on the tabulator to
16 show that it did, in fact, record a vote for George Washington.
17 And you should do the same for Thomas Jefferson to make sure
18 that his -- a vote for him would work all the way through to
19 the tabulation.

20 But you also have to make sure that the -- that the votes
21 aren't being swapped, that they are not crisscrossing. Right?
22 If you just vote one vote for George and one vote for Thomas,
23 you won't necessarily know that they -- that the correct winner
24 is going to be indicated. So I think you have to check a
25 number of things.

1 And I actually recommend usually that we go a step further
2 even than the statute does and test the audio ballot that is
3 used by voters who are blind to ensure that there is no errors
4 there because you wouldn't want those to be crisscrossed. And
5 the same for language -- for ballot marking in other languages.
6 There is a lot of testing that goes into these ballot-marking
7 devices to make sure that the technology is going to behave
8 correctly on election day.

9 **Q.** So when you say crisscross, you mean that I voted for
10 George Washington but it is recorded as Thomas Jefferson?

11 **A.** Correct. Let's say that I followed a logic and accuracy
12 procedure. So I cast one vote for George Washington, and I
13 printed on the ballot-marking device, and I run it through the
14 tabulator. Then I do another one for Thomas Jefferson and do
15 the same thing.

16 Now I have one vote for each. So when I look at the final
17 results, I expect to see one vote for each. But how do I know
18 that they didn't get swapped? How do I know that it correctly
19 attributed them?

20 So usually what you would do is give two votes for George
21 Washington and one vote for Thomas Jefferson. That way in the
22 end results you can see each candidate was capable of receiving
23 a vote and they were correctly attributed.

24 **Q.** What, if any, issues do you see if you are only testing
25 for one candidate's race per machine?

1 **A.** Then if you are thoroughly testing that candidate's race,
2 then you can feel good that that candidate's race is not going
3 to have problems. You cannot make any assertions about any
4 other race on the ballot.

5 It is similar to the problems with the risk-limiting
6 audits that we talked about. If you are only auditing one
7 race, you are only going to detect problems in one race.

8 Once you test, the scope of your testing determines
9 whether you will find the problems. If you don't look, you
10 can't find them.

11 **Q.** Well, if I -- I mean, this is structured right now so that
12 I have, let's say, five machines. I test machine Number 1 on
13 the presidential race and the next one, machine Number 2, on
14 senate race number A or letter number A.

15 Does the fact that I've been able to test the presidential
16 race on the first machine tell me anything about the
17 functioning and -- internal functioning and accuracy of machine
18 number B that I'm testing for the senate race?

19 **A.** It does not. It does not. And you can make -- you can
20 make an assumption or use that to think that maybe it should be
21 right. But you have not tested it. So you don't know.

22 **Q.** And I mean, each of these are independent basically
23 computers; is that right?

24 **A.** That's correct.

25 **Q.** All right. And with respect to the unique ballot style,

1 what is the issue in your mind specifically about why each
2 ballot style should be tested on each BMD? I know it provides
3 that they don't have to be. But why in your view --

4 **A.** Ballot style is a separate discrete unit. So an example
5 is in a primary you might have a ballot style for the
6 republicans and a ballot style for the democrats. Those are
7 two separate styles.

8 In some -- some polling places, you may have, you know,
9 school board elections that are different on one ballot and not
10 on the other. Whereas, everything else on the ballot is
11 potentially the same.

12 I think you need to check both of those because the ballot
13 itself is not just the change to the bottom of it. There's all
14 sorts of other information that is there as well.

15 **Q.** You mean the races. But does it also affect in terms of
16 what is being tested on a logic and accuracy how it -- how the
17 computer computes and how it records the information?

18 **A.** I'm sorry. Could you ask that one more time.

19 **Q.** I'm just trying to understand. Is the logic and accuracy
20 testing regarding how the computer computes that particular
21 race and also where it locates the information?

22 **A.** Yes. So on the ballot-marking device, you are testing
23 that it marks a ballot correctly; that whatever you do on the
24 screen is reflected in what is output on paper at the end.

25 On a tabulator, you're validating that when you take the

1 input of the ballot into the tabulator that the totals that
2 come out at the end match correctly. In both cases, you are
3 looking to see if what goes in gives you what you expect to
4 come out on the other side.

5 **Q.** And I guess from your perspective -- and I know I have
6 asked this in different ways. But I want to just make sure.

7 What you perceive as the problem about just testing one
8 race is it doesn't yield information about how the computer
9 handles the full range of the ballot?

10 **A.** That is correct. It is not testing that each of these
11 machines is behaving properly on all of these contests. So if
12 you -- if we sort of give a hypothetical example, let's say
13 that there was a contest where we found that one ballot
14 style -- the school board race at the bottom was computed
15 correctly but on another ballot style it wasn't. And we asked
16 ourselves afterwards, well, why didn't we detect that? Why
17 didn't we find that there was this problem in this one race?
18 And it is not just hypothetical. That is actually what
19 happened in the example I gave in Northhampton County.

20 There was some races that worked perfectly fine. Their
21 totals were exactly right. If you had looked at that race,
22 there was no problem. But then there were other contests where
23 something that was a little bit different about those contests
24 and the way that it was set up caused a problem so that some
25 candidates got zero votes -- where winning candidates got zero

1 votes.

2 MR. MCGUIRE: Your Honor, if I may, just a couple of
3 questions inspired by your own.

4 REDIRECT EXAMINATION

5 BY MR. MCGUIRE:

6 **Q.** Mr. Skoglund, is it fair to say that logic and accuracy
7 testing is a functional test or is it a security test?

8 **A.** It is both. I mean, it is the way that you make sure that
9 it is -- that it is working properly. And that is in the realm
10 of security. I mean, like I said, the threats to security are
11 not just from foreign nation states or from insiders who may be
12 trying to manipulate the election and have access to the
13 files -- right? -- and know what you are going to test where.

14 It is also, you know, for more common type problems as
15 well. In the case of Northhampton County, it was a common type
16 mistake in the configuration.

17 So it is both. It is a functional test that is an
18 important part of security.

19 **Q.** Would you expect conducting a logic and accuracy test to
20 necessarily reveal the existence of malware on a system, for
21 example?

22 **A.** No, it would not reveal that. I mean, it could reveal
23 that. If there was, let's say, clumsy malware, it might reveal
24 that at that point. But the famous case is Volkswagen's test
25 of their emissions. You know, they gamed the system so that,

1 you know, when they were testing it, like during logic and
2 accuracy essentially for the cars, they would pass their test.
3 But then in the real world, you know, they were failing the
4 test.

5 And the same thing is here. You could easily have malware
6 that was set to not operate before a certain date or to wait
7 until, let's say, 53 ballots were cast before it kicks in. So
8 there are all sorts of ways malware could evade these tests.

9 MR. McGUIRE: Thank you. Nothing further.

10 RE-CROSS-EXAMINATION

11 BY MR. TYSON:

12 Q. Mr. Skoglund, just one brief question. You have never
13 seen actual malware in an actual election affect the
14 ballot-marking device; correct?

15 A. I'm sorry. When you say have I seen, what do you --

16 Q. Do you know of any instance in the United States where
17 malware has been put on a ballot-marking device in an actual
18 election?

19 A. No, I don't. Ballot-marking devices are very new to the
20 market. They really just started being sold as systems for all
21 voters to use in the last four years or so.

22 Before that, they were much simpler. They were really
23 just filling in the ovals on regular ballots.

24 MR. TYSON: That's all I have, Your Honor.

25 THE COURT: Thank you very much, sir.

1 Are we through with the presentation of evidence,
2 Counsel?

3 MR. TYSON: For the State defendants, yes, Your
4 Honor.

5 MR. CROSS: Yes, for Curling plaintiffs.

6 MR. McGUIRE: For Coalition as well.

7 THE COURT: All right. Are there any -- if there are
8 any exhibit issues or any evidentiary issues, why don't we take
9 them up afterwards and just making sure we have the exhibits in
10 order or that I have ruled on everything -- whatever is
11 outstanding or that I will in that event.

12 We're about to -- for those who are participating --
13 everyone is participating remotely -- but listening in, we are
14 going to have closing argument.

15 I have allocated 20 minutes. The plaintiffs have two
16 sets of counsel. Fulton County and the State represent the
17 defendants, and it will be the same thing.

18 So if the State defendants haven't determined how you
19 are dividing it, please do. I could slow things up because I
20 have my own questions as you have all seen and have some more
21 questions about the audit issues.

22 I will not -- any time I spend on my questions -- you
23 responding to my questions I won't count against you. I'm
24 going to allow everyone to take a restroom break, and we'll --
25 it is 1:47. We should come back immediately. When we see

1 everyone here, we will start then. Otherwise, I will assume we
2 will be starting within five minutes.

3 MR. TYSON: Thank you, Your Honor.

4 MR. CROSS: Thank you.

5 **(A brief break was taken at 1:47 P.M.)**

6 THE COURT: All right. Are we ready to begin?

7 MR. BROWN: Yes, Your Honor.

8 MR. TYSON: Yes, Your Honor.

9 THE COURT: All right. Who for plaintiffs is
10 proceeding?

11 MR. McGUIRE: Yes, Your Honor. We were planning to
12 spend ten minutes for -- I would go for ten minutes and then
13 Mr. Cross would spend ten minutes on rebuttal.

14 THE COURT: All right.

15 MR. McGUIRE: Shall I begin?

16 THE COURT: Yes.

17 CLOSING ARGUMENT

18 MR. McGUIRE: Thank you, Your Honor. I'm Robert
19 McGuire. And I'm counsel for the Coalition plaintiffs in this
20 case.

21 In the course of bringing this request for relief,
22 we, the plaintiffs, have been guided by this Court's previous
23 holding from September of 2018 when the Court ruled that if a
24 new ballot system is to be launched in Georgia in an effective
25 manner it should address democracy's critical need for, quote,

1 transparent, fair, accurate, and verifiable election processes
2 that guarantee each citizen's fundamental right to cast an
3 accountable vote.

4 Now, all of the evidence that is in front of the
5 Court, whether in the papers or through this three-day hearing,
6 shows that the State's BMD system satisfies none of these
7 requirements. As the Supreme Court held in *Wesberry vs.*
8 *Sanders* in 1964, the right to vote is one of our most precious
9 rights. Other rights, even the most basic, are illusory if the
10 right to vote is undermined. And that is exactly what has
11 happened or will happen if the changes that the plaintiffs are
12 requesting are not made for the upcoming November election.

13 Mr. Tyson said in his opening that ultimately the
14 plaintiffs want to vote using a different system in their
15 precinct. He calls this a policy dispute that the plaintiffs
16 lost in policymaking bodies and they are trying to enforce in
17 court.

18 Nothing could be further from the truth. The
19 plaintiffs here are not asking for a whole new voting system.
20 They are not asking for a different voting system than the
21 voting system that has been put in place. What we are asking
22 for are four constitutionally required improvements to the
23 existing voting system. And each of these four improvements
24 that we are asking the Court to order will either remove
25 complexity and risk or they will add much needed redundancy.

1 So I'm going to go through each of those four items of relief
2 very briefly.

3 Improvement one is to require the State to provide
4 updated paper pollbook backups in the polling places to ensure
5 that there is no disenfranchisement of in-person voters as we
6 have seen in past elections.

7 Improvement two is going to remove the BMD touch
8 screen printer combo and instead have in-person voters use
9 hand-marked paper ballots as the default voting method.

10 Improvement three has to do with scanning. For
11 central scanning, the Secretary should change the sensitivity
12 settings on the scanners so that any perceptible voter mark is
13 either counted or reviewed by a vote review panel. For the
14 precinct scanners, voters should be provided black pens that
15 they can use to mark emergency ballots.

16 Fourth and finally, we have improvements that we are
17 asking the Court to order in respect to auditing. So I'm going
18 to briefly touch on each of these four.

19 With respect to updated paper pollbooks -- updated
20 paper pollbook backups, the State defendants have never denied
21 that their malfunctioning electronic pollbooks led directly to
22 long lines and resulting disenfranchisement during the June
23 primaries here in Georgia.

24 Mr. Barron confirmed that he and the other metro
25 counties are still experiencing serious problems with the Poll

1 Pads in that September election. We are still experiencing
2 them in the September election. He also confirmed that having
3 updated paper Poll Pad -- pollbook backups would help. This
4 Court has been asking the State defendants since at least the
5 December 6th, 2019, status conference, which is discussed in
6 our brief for the Poll Pad motion at 800-1 at Pages 8 and 9 --
7 the Court has been asking the State defendants since at least
8 December 2019 why updated paper pollbook backups should not be
9 granted. And at this hearing when asked what the burden would
10 be upon the State to provide this easy and effective remedy,
11 Mr. Harvey still had no answer.

12 In our brief, 800-1, on the pollbook issue, Coalition
13 plaintiffs described in exhaustive detail our efforts to try to
14 convince the defendants to make this change outside of
15 litigation. It is an easy change to make.

16 It is clear the State defendants are not going to do
17 anything unless they are ordered to do so. And this is the
18 opportunity for that improvement to be made.

19 The second improvement that we are requesting is to
20 remove BMD touch screen and printer combos and use hand-marked
21 paper ballots instead. The *United States vs. Saylor* case from
22 the Supreme Court in 1944 recognized that voters have a right,
23 quote, to have their expressions of choice given full value and
24 effect by not having their votes impaired, lessened,
25 diminished, diluted, and destroyed by fictitious ballots

1 fraudulently cast and counted, recorded, returned, and
2 certified. That is a right that is 70 years old in the Supreme
3 Court's eyes, and it cannot be guaranteed by Georgia's current
4 voting system because the lack of security makes it impossible.

5 Harri Hursti's testimony showed that the BMDs are
6 insecure and simply cannot be secured. He showed that the
7 system hasn't been hardened, that the BMDs have a huge attack
8 surface. He showed that Xbox console and Russian games are
9 installed on the EMS servers in multiple counties. Physical
10 security of the EMS server is all but nonexistent. He showed
11 that multiple ballots can be printed and cast by a voter.

12 The State's defense that the system is certified by
13 the EAC provides no comfort for the reasons that Mr. Skoglund
14 testified about under seal. As Harri Hursti explained, voting
15 system testing focuses on functionality, not security.
16 Penetration testing by voting system labs is very limited.

17 Dr. Halderman's testimony showed that the BMD system
18 is vulnerable to undetectable manipulation. The very same kind
19 of evidence underlay this Court's decision to find the DREs
20 unconstitutional. The same kind of reasoning justifies finding
21 the BMDs unconstitutional now.

22 This insecurity cannot and is not being remedied.
23 The LAT procedures, which aren't even capable of catching
24 sophisticated malware, as Mr. Skoglund testified just moments
25 ago -- they are not even being run in their most bare bones

1 basic fashion that State law requires. Each machine is being
2 tested on one contest, not even on multiple ballot styles. And
3 that is the State's official guidelines. The State just
4 doesn't do the testing that even State law requires.

5 You have heard from Professor Stark, Dr. Stark that
6 BMDs are not auditable. There are multiple reasons for it.
7 But people don't look -- they don't look at their ballots.
8 They don't review whether the ballot card that is coming out of
9 the printer matches what they did on the machine. And because
10 of that, the BMD ballot cards cannot be meaningfully audited.
11 They are not what the voter did. They are what the machine
12 did. And the machine can be manipulated to do things that the
13 voter did not do.

14 Finally, on this point, BMDs violate ballot secrecy.
15 The touch screens violate ballot secrecy because they are so
16 large that anyone within a line of sight to a person's BMD
17 screen can see how that voter is voting. There is a mountain
18 of evidence in the record on this issue. It is completely
19 uncontroverted.

20 The only thing that the State says that even comes
21 close to trying to controvert it is Mr. Harvey saying that they
22 tried to develop sketches of how to set up a polling place so
23 that it wouldn't happen. But all of the evidence or most of
24 the evidence that has been introduced came in after those
25 sketches were implemented. They don't work. The State has not

1 been able to fix this problem. They are aware of the problem,
2 which is why they are trying to solve it with sketches. But
3 they are unable to solve it.

4 As a result, rights are being violated. And the
5 right to vote is being burdened -- severely burdened because
6 the secret ballot is fundamental to the right to vote. And
7 when the secret ballot is denied, the right to vote is burdened
8 because voters are unable to freely cast the votes that they
9 want.

10 It is more than feasible for this second change to be
11 implemented. It is already the emergency plan on election day.
12 Rick Barron testified that Fulton County could do it on
13 election day. You have got testimony -- you have got evidence
14 in the record that Athens-Clarke County was able to do it
15 overnight. Kevin Skoglund's testimony showed that New York
16 City was able to do it. Mr. Barron, in fact, said that not
17 only could it be implemented for election day but he testified
18 that it would actually wind up giving him more time because it
19 would take less time to deploy hand-marked paper ballots than
20 to set up all of the BMDs.

21 Although the State defendants have made the argument,
22 there is no evidence that there is not enough printing capacity
23 to make this solution possible. And there is evidence that
24 special paper isn't required for the ballots to be scanned into
25 the tabulators. So there is really no reason not to replace

1 the BMDs. There is no good reason.

2 So what about early voting? Kevin Skoglund explained
3 how that works in places that have lots of early voting
4 centers, like New York City. Ballots can be stockpiled in
5 early voting centers, especially the ones that are most likely
6 to be used in particular locations. And they can be
7 replenished every night using the ballot-on-demand printers,
8 just like New York City does. It is simply not an argument
9 that it is not possible to replace the BMDs with paper ballots.
10 It is more than possible.

11 In the 1950s and the 1960s, federal courts
12 transformed society in order to ensure that there was equal
13 treatment under the law. The interests that are at stake in
14 this case are similarly weighty, and they are no less
15 fundamental.

16 The right to vote is ultimately the right that
17 guarantees all of our other rights. That is why the Supreme
18 Court said in *Wesberry vs. Sanders* that no right is more
19 precious in a free country than the right of having a voice in
20 the election of those who make the laws under which as good
21 citizens we must live.

22 This case is about the right to vote, and it is about
23 equal protection. And it is emphatically a role of the federal
24 courts to protect those rights when they are deemed violated.
25 And the fact that there is inconvenience does not justify

1 violation of those rights. And as we have shown in the
2 evidence, any inconvenience that the State argues is overblown
3 anyway.

4 Improvement Number 3 has to do with scanning. We are
5 asking the Court to order that the scanner settings on the
6 central scanners be adjusted so that every vote counts. And
7 that is a simple -- simple procedure that can be done.

8 The Court saw the ballots where people plainly to the
9 human eye marked a vote that was then not counted. The State,
10 the defendants, Dr. Coomer -- they approached this in a way
11 which is disturbing because their answer is votes are being
12 discarded, they are just not being counted. And that is an
13 outrageous -- outrageous defense to take when people are
14 actually losing their voice in elections.

15 And we have got evidence. They can't refute it.
16 There is no evidence on the other side. I mean, we have shown
17 the Court ballots that have had votes discarded. Those people
18 have lost the right to vote on those races. They are
19 disenfranchised.

20 And the scanner settings, as Mr. Hursti explained,
21 can be adjusted in a way that makes it -- that catches those
22 votes. You just -- he suggested that you scan in gray scale or
23 color. He suggested that you scan in the higher dots per inch
24 setting, and he suggested that if that happens then you are
25 going to be able to avoid getting rid of those votes.

1 The State has adopted a new scanner rule that they
2 claim, without any evidence, will solve this problem. The only
3 evidence they have given you is Exhibit DX 4, which is the
4 Michael Barnes document. DX 4 is a long draft analysis of
5 the -- of the various scanner threshold settings. But the most
6 important part is at the very end on Page 7 in the second to
7 last paragraph. Even using the settings that they just
8 adopted, which set between 10 and 20 percent as the range for
9 the perceiving ambiguous votes, seven ballots out of their test
10 deck were read as completely blank. Those are ballots that a
11 human would have perceived as votes.

12 Under Georgia law, if you can perceive voter intent
13 from a ballot mark, you have to count that vote. Those seven
14 votes would be people who under their current settings that
15 they just adopted, would be disenfranchised. The answer is to
16 adopt scanner settings that look at any human mark below the
17 definite vote threshold as requiring review by a vote review
18 panel so that a human can look at the ballot and determine
19 whether there is actually a vote there. A machine should never
20 discard a human marking. That is arbitrary. It is
21 unconstitutional.

22 MR. CROSS: Your Honor, I'm sorry to interrupt. We
23 are going to have a time issue here.

24 MR. MCGUIRE: And you know what? My timer isn't
25 running. So I'm very sorry. I don't want to eat up Mr. Cross'

1 time. Let me just say the final point that I have on the
2 merits here.

3 Improvement four is auditing. A voting system that
4 cannot be audited to confirm the outcome it produces is correct
5 fails by definition to protect the right of each voter to enjoy
6 transparent, fair, accurate, and verifiable election processes
7 that guarantee each citizen's fundamental right to cast an
8 accountable vote.

9 Dr. Stark addressed this. If we keep the BMDs, they
10 can't be audited. They are not auditable because you are not
11 auditing what the voter did. You are auditing what the machine
12 said the voter did. And that is not an auditable record.

13 So, Your Honor, we would claim that there should be
14 some auditing improvements. But they really need the BMDs to
15 be removed and replaced with hand-marked paper ballots.

16 And on that, I'll rest.

17 THE COURT: Yes. I would like to ask you one
18 question that I'm not counting against your time. I don't have
19 right now Mr. Barnes' analysis in DX 4 in front of me. And I
20 will pull it up.

21 But are the -- when you talked about the seven
22 ballots that came up as blank but, in fact, are markings, is
23 that referenced in his analysis?

24 MR. MCGUIRE: It is, Your Honor. It is the second to
25 the last paragraph on Page 7 of Doc. 887-4.

1 THE COURT: Eight -- I'm sorry?

2 MR. McGUIRE: It is Document 887-4 at Page 7. It is
3 also Exhibit DX 4.

4 **(There was a brief pause in the proceedings.)**

5 THE COURT: All right. Thank you very much. I was
6 looking at the document. Thank you.

7 MR. McGUIRE: Thank you, Your Honor.

8 THE COURT: That was 7 ballots out of 29 needing
9 physical review. All right. Thank you.

10 MR. TYSON: Your Honor, I have talked to the Fulton
11 defendants, and they will not be closing separately, so we will
12 end up closing for all of the defendants.

13 THE COURT: All right. Very good.

14 CLOSING ARGUMENT

15 MR. TYSON: Your Honor, it has been said that
16 nostalgia is an incredibly powerful force. And in this case,
17 the plaintiffs are nostalgic for the day that they filed this
18 case more than three years ago. They continue to pretend like
19 nothing has changed.

20 But I think it is important for us to talk about what
21 has changed since 2017 when this case began. The Georgia
22 General Assembly and Governor endorsed sweeping update to the
23 election infrastructure in this state after the 2018 election.

24 Those updates included robust protections for absent
25 provisional ballots, updates to statutes about absentee

1 ballots, requirements to harden the voter registration
2 database. The General Assembly appropriated more than
3 \$100 million to upgrade Georgia's voting system to a paper
4 ballot system endorsed by the panel of experts on the SAFE
5 Commission.

6 And Georgia became one of only a handful of states
7 that developed statewide risk-limiting audits for use in the
8 November 2020 election working with VotingWorks. And as you
9 heard, that is the same organization trusted by the Department
10 of Homeland Security to develop and implement auditing tools
11 for elections.

12 Georgia has continued to remediate the risks
13 associated with its computer systems. And Georgia now has
14 record high voter registration, an online absentee ballot
15 request portal, and state of the art technology.

16 Plaintiffs pretend like none of this ever happened.
17 When we began on Thursday, I said you were going to hear a lot
18 of recycled theories and speculation. And that is just where
19 we have ended up. And those recycled theories and speculations
20 are insufficient to carry the plaintiffs' heavy burden to
21 clearly establish the preliminary injunction requisites for an
22 election that is underway with absentee ballots going out this
23 week and early voting beginning in 28 days.

24 First, the plaintiffs have not shown any likelihood
25 of success on the merits. They haven't shown any burden on the

1 right to vote. This is a case about ballot-marking devices
2 principally. And there has been no testimony that a Dominion
3 BMD system has ever been actually hacked in an election.

4 The plaintiffs have not been able to connect any
5 identified vulnerabilities from the old system to anything
6 related to the ballot-marking devices. The most they have to
7 hang their hat on after three days of this Court's time and
8 after obtaining thousands of documents in expedited discovery
9 is a single email about a USB drive that doesn't say for sure
10 what happened.

11 So apparently now their theory is that maybe -- just
12 maybe a single USB drive in one county somewhere in the state
13 has some sort of malware on it and it somehow works on both
14 DREs and BMDs, can adept to each election prior to knowing the
15 candidates or the races, and has remained hidden from Dr.
16 Halderman's forensic analysis of both the GEMS databases and
17 actual DREs.

18 THE COURT: I think you have to slow up, or else
19 Ms. Welch is not going to be able to get your argument. I know
20 you want to get a lot in. But you have --

21 MR. TYSON: I apologize, Ms. Welch.

22 The preliminary injunction standard of clear
23 entitlement is nowhere to be found in the evidence. Further,
24 the plaintiffs have shown at most exactly the kind of thing
25 that we can easily work through in discovery to figure out what

1 happened. And you heard extensive testimony about the
2 functioning and the hardening of the system.

3 For paper backups, we have dealt with that issue
4 extensively in the briefing. Mr. Harvey testified as to the
5 burden on the State. The printing cost is significant. The
6 Coalition plaintiffs haven't put forward contrary evidence at
7 this point.

8 On scanners, the evidence shows that reasonable
9 protocols, which are consistent with the instructions on the
10 ballot and further the State's interest in the efficient and
11 equitable administration of elections. The plaintiffs' expert,
12 Mr. Hursti, did not testify to proper settings or offer any
13 standard in the professional community. Instead, he only
14 offered that the State should evaluate and study the proper
15 settings. Well, the evidence shows that the State did so and
16 Mr. Hursti chose not to review that.

17 And even still the evidence shows that --

18 THE COURT: That is not quite right. That is not
19 quite right. I mean, basically he had one particular
20 recommendation, and there is no indication as to the DPI that
21 you looked at that at all.

22 I mean, there was a different suggestion that you
23 made I realize in terms of basically the way you assess it.
24 But there was a very concrete recommendation that there was no
25 indication that you-all looked at.

1 MR. TYSON: Your Honor, I think this gets us back
2 to -- as Dr. Coomer explained, the way that the plaintiffs have
3 framed up their threshold setting issue would require every
4 single hand-marked ballot to be reviewed if there was no vote
5 found because part of the oval would form part of the
6 percentage.

7 And so I think we're, again, at a point where if
8 we're down to -- if the State's current threshold settings and
9 the DPI settings violate the U.S. Constitution, the -- that is
10 a significant step forward, Number 1. But, Number 2, given
11 dramatic increase in mail-in voting, Mr. Harvey's testimony is
12 that having to do a personal review of every single hand-marked
13 ballot that has zero percent threshold, any stray mark
14 anywhere, would delay certification of an election at a time of
15 heightened political intensity. And that is only after the
16 voter has disregarded all the instructions of how to fill out
17 the ballot.

18 THE COURT: I don't think you really responded to my
19 question. Did anyone look at the 300 DPI? And I don't have
20 any basis from the testimony really for determining that that
21 would mean every single ballot had to be examined.

22 MR. TYSON: Your Honor, I believe Dr. Coomer went
23 into detail about the 300 versus 200 DPI, and the software is
24 built around interpreting the percentage fills based on what it
25 reads.

1 So, again, if we're at a point where we're ordered to
2 go to 300 DPI, I don't think there is any testimony that that
3 is feasible or possible under the current system, as I
4 understand it.

5 THE COURT: Okay. Go ahead and continue.

6 MR. TYSON: Thank you. The timely certification of
7 this year's election is of critical State interest that
8 outweighs even the slightest burden on the right to vote
9 relating to scanners.

10 On auditing, the evidence shows that Georgia's
11 process is even more robust than almost every other state. And
12 while plaintiff disagrees that BMD ballots can be audited at
13 all, that position is hardly uniform across the field. And a
14 reasonable policy disagreement among experts does not amount to
15 a violation of the United States Constitution.

16 Dr. Adida made clear that the process used in Georgia
17 has been carefully piloted. It is a necessary step for its
18 proper implementation, as the National Academy recommends and
19 similar to other states that have been early adopters of
20 statewide audits.

21 I know the Court had some concern earlier. The
22 audits, as Dr. Adida testified, will involve a review of
23 (unintelligible) individuals of the ballots. We are not
24 relying -- this is a ballot pulling audit. But it is not going
25 to be a situation where no one is ever looking at the actual

1 ballot to determine what the auditing process should be.

2 THE COURT: Is it correct what he said -- when I
3 asked him about that, he said, yes, we are going to look at the
4 ballot. But what he is going to do then is he is never going
5 to compare that ballot to any electronic record for that ballot
6 as to the vote actually counted.

7 So I mean, why is it meaningful? He did not -- he
8 did not respond to that question at all.

9 MR. TYSON: And I believe as you will recall, Mr.
10 Rayburn spoke back in March to the process by how they were
11 doing this, that as the auditors are looking at each ballot you
12 are looking at the ballot and the audit mark. So you are
13 looking at what did the machine interpret, what did the vote --
14 what is on the ballot, and then you are comparing that. And,
15 again, as Dr. Stark said, the purpose of a risk-limiting audit
16 is to determine did the right person win the race. It is not
17 to ensure that every single individual vote is being assigned
18 individually, but you are still looking at those issues.

19 THE COURT: I'll let you go on. We'll discuss this
20 more at the end. All right?

21 MR. TYSON: And considering, Your Honor, that the
22 vast majority of states are not going to conduct a
23 risk-limiting audit of any kind in the 2020 election, the
24 plaintiffs haven't shown that the particular auditing method
25 Georgia is using places a burden on the right to vote or is in

1 any way violative of the U.S. Constitution.

2 THE COURT: But no other state virtually has done a
3 statewide BMD system. That is the reality. You are an unusual
4 situation. There are jurisdictions -- smaller jurisdictions,
5 cities that have done BMDs. But this is basically the entire
6 state. And so it is -- it does put the State in a much more
7 challenging position.

8 MR. TYSON: Your Honor, again, I think that it is
9 important to remember that, yes, while the number of states
10 that currently use a statewide implementation of BMDs is a
11 growing number but a small number right now, very large
12 jurisdictions from Cook County to Los Angeles to other places
13 around the country are using BMDs for all of their in-person
14 voters as well.

15 So this is not a situation with the DREs where we're
16 at the tail end of a system. This is a situation where Georgia
17 is taking a significant step forward in this process in a lot
18 of areas.

19 And so I think at the end, the burden -- the failure
20 of the plaintiffs to identify a burden on the right to vote --
21 that should be the end of the preliminary injunction quest in
22 this case.

23 But it is incredible to me that despite the lack of
24 evidence of where we are on this and based solely on
25 speculation, at least one of plaintiffs' experts, Mr. Hursti,

1 told Georgians they should have no confidence in our election
2 system, a shocking allegation that to me undermines the very
3 legitimacy of the elections the plaintiffs claim that they seek
4 and is necessary for us to have a functioning democracy.

5 At the best reading, the plaintiffs at this point
6 have shown maybe three things. One, there is a disagreement in
7 the election community about the scope and the use of audits.
8 Two, the rather unremarkable fact that people with unrestricted
9 access can do what they want with computers, as Mr. Hursti
10 testified. And, three, that voters who disregard instructions
11 for filling out hand-marked paper ballots may have challenges
12 with the scanners under the thresholds that were in existence
13 before.

14 And none of these issues are sufficient for this
15 Court to find a likelihood of success on the merits for any of
16 the issues that are actually alleged in the plaintiffs'
17 complaints. And without the likelihood of success, there is
18 nothing this Court can do and there is no basis for a
19 preliminary injunction.

20 But, second, the plaintiffs have also presented no
21 evidence of any irreparable harm. They just assume irreparable
22 harm for purposes of this motion. They have nothing to say on
23 the issue about the fact that this case is ultimately about the
24 outcome of an election or the possible outcome of an election,
25 not the individual right to vote, which means the case is

1 foreclosed according to *Jacobson*.

2 In order for there to be any injury to any plaintiff,
3 a bad actor would have to design and build malware that is then
4 placed in the BMDs that are right now being programmed for the
5 November election that somehow can alter enough votes to make a
6 difference but not enough for voters to actually notice.

7 It is not a manipulation that is discovered while
8 conducting a risk-limiting audit and that actually affects the
9 outcome of an election. And compared with the plaintiffs'
10 claims in *Clapper*, that is a far more attenuated chain of
11 possibilities than in that case.

12 And so the only thing that each plaintiff has to do
13 to avoid that possible imagined theoretical scenario is to
14 request a hand-marked ballot, fill it out by hand, and then
15 return it in a dropbox by election day.

16 There is no irreparable harm here. And even if the
17 individual plaintiffs can fix their injury this way, the
18 evidence that we submitted on the Coalition for Good
19 Governance's 9940 for 2018 indicates that 98 percent of their
20 organizational budget is being spent on litigation. There is
21 no diversion of resources.

22 Your Honor, on the third and fourth prongs, again,
23 the plaintiffs' lack of evidence is staggering. They offer no
24 evidence that their preferred method of voting would remedy
25 their purported election security injury, rather than open

1 vulnerabilities for less sophisticated mechanisms of hacking.

2 They still offered nothing to explain why the system
3 they dislike is unconstitutional for them but perfectly
4 acceptable for disabled voters. They have presented absolutely
5 no evidence from anyone with statewide election experience that
6 what they propose is actually feasible.

7 They didn't give you anyone who opined that what they
8 propose can be done in the 28 days between today and the start
9 of early voting on BMDs. No one has designed a process to
10 deploy paper ballots to every county's early voting site that
11 includes every possible ballot combination. As you heard,
12 Fulton County alone would have to plan and deploy more than 700
13 different ballot instances at all 33 early voting sites in the
14 next 28 days.

15 Election day and early voting are two completely
16 different things. Absentee-by-mail processing and in-person
17 hand-marked paper ballots on election day are two different
18 things. And the plaintiffs continue to conflate them,
19 demonstrating their lack of understanding of the actual
20 administration of elections.

21 Where is the training and logistical support for that
22 system? Where are the election administration experts who
23 endorse this plan to change Georgia's election system in a
24 matter of weeks?

25 They say just turn off the BMDs and have the system

1 function properly. But there is no opportunity and they have
2 shown nothing that this is feasible or possible on the time
3 line that they have given this Court.

4 So I want to be absolutely clear the plaintiffs have
5 shown no reason why any Georgia voter should doubt Georgia's
6 election system. The plaintiffs have not shown -- I want to be
7 so clear about this -- any reason why any Georgia voter should
8 doubt Georgia's election system.

9 And, further, it makes no logical sense to exchange a
10 suspected hypothetical security risk, which has never been
11 shown in an actual election across -- for a well-known,
12 well-documented, constant, easily accessible, and universal set
13 of security risks associated with hand-marked paper ballots,
14 especially making that change in a matter of days. It doesn't
15 take sophistication to hack those. Only a Sharpie.

16 I want to remind everyone as we are wrapping up here
17 where we are in this case after more than three years. We
18 haven't yet had full discovery on these claims about BMDs and
19 the Dominion system. We haven't had expert reports. We
20 haven't had expert depositions. We haven't had summary
21 judgment briefing.

22 This is a hearing held on a reduced evidentiary
23 standard weeks before an election without the benefit of the
24 adversarial process to test the documents and the testimony
25 that plaintiffs have continued to add to the record in this

1 case. And without the Court being given the benefit of that
2 process to sort through the very complicated election
3 administration issues in this case and election administration
4 is complicated.

5 Plaintiffs are seeking these sweeping changes. They
6 are ultimately asking this Court to completely rewrite the
7 State's election code and draft detailed election
8 administration policies to supplant those that are authored and
9 enacted by the General Assembly and the State Election Board.

10 Your Honor, as someone who represents election
11 officials, I also want to be clear about this: This is already
12 an extremely high degree of difficulty election. It is a
13 presidential year. There is going to be record turnout. All
14 of us can recognize that we are operating in the midst of a
15 divisive political environment. And we are still in the middle
16 of a pandemic that has upended almost everything about our
17 lives.

18 Making further changes or adjustments to the election
19 system like the plaintiffs propose at a large level like the
20 BMDs or at a more administrative level like these pollbook
21 changes, audits, scanners -- making those changes now is a
22 recipe for disaster in an already challenging election year.

23 This Court should deny all the plaintiffs' motions,
24 allow Georgia to go forward on the system chosen by its
25 policymakers and designed by its election officials, and allow

1 this case to hear the rest of plaintiffs' claims on a normal
2 discovery track and a normal litigation track going forward.

3 Georgians can and should have confidence in their
4 elections running the Dominion voting system for the 2020
5 election.

6 Thank you, Your Honor.

7 THE COURT: All right. Let me just ask you a
8 question or two. Is there a contradiction between your
9 position that, on one hand, Georgians can rely on the absentee
10 ballot process but you cast doubt on the reliability of a hand
11 ballot process?

12 MR. TYSON: Your Honor, there are two -- there is not
13 a contradiction there because the chain of custody and the
14 statutory and administrative structures around absentee ballots
15 have been in place for a long time. They are well established.
16 They are well understood.

17 Having lots of additional live ballots beyond just
18 the emergency ballots that are in a polling place on election
19 day, that would be a completely new thing for Georgia to
20 implement. And that is a different setup than dealing with the
21 verifiable process you can use in the absentee ballot
22 situation.

23 THE COURT: With regard to -- again, this is not
24 against your time in any way.

25 But with respect to the experience of voters,

1 including members of these organizations and the individual
2 plaintiffs in coming in and having -- basically facing
3 challenges because they are either waiting in lines or there is
4 a major -- major obviously change in the introduction of a new
5 system -- and there were substantial issues in the June
6 election, and there are continuing problems. And I'm not
7 saying that they are going to continue. I know the State is
8 trying to address these. But they were enormous and enormous
9 in particular communities.

10 Why wouldn't the State under these circumstances --
11 when it has a provision under its own rules for emergency
12 ballots, why wouldn't the State truly make an arrangement for
13 that that makes it real so that we actually on election day --
14 we're not talking about before election day. But on election
15 day that if these sorts of lines develop and that are a
16 function also of not just, oh, we have got so many people
17 coming -- because that is what we anticipate, that is what we
18 want in a presidential election, and it is what we -- the State
19 has a reason to expect -- that we -- that the emergency ballot
20 process is used and that you are equipped to use it also or the
21 precincts are equipped to use it because they also are able --
22 quickly to be able to consult with a full printout and
23 up-to-date printout of who has cast votes so that they only
24 have to call about a limited number of ballots to the county
25 office.

1 Why wouldn't that be an appropriate remedy in this
2 case given the introductions of a lot of new machinery that at
3 least as of this point has been shown from the last election --
4 serious election here in June have had a truly detrimental
5 impact on people being able to easily exercise their vote at
6 least in a number of population centers?

7 MR. TYSON: Your Honor, I think what you have
8 outlined is essentially what the State Election Board rules
9 require to happen. And I know for June 9, as an example -- I
10 represent Gwinnett County. And in the Gwinnett elections, they
11 were able to use all their emergency ballot supplies to open
12 precincts when there was late delivery of equipment.

13 So I think what you find is maybe a training issue
14 for poll workers, which I know that recruitment of poll workers
15 has been a very high priority for the Secretary and for county
16 election officials. I know there has been and there is
17 evidence in the record from Mr. Harvey about the extensive
18 updates to training of officials and poll workers on these
19 various points.

20 And since the State Election Board rules require
21 there be a paper backup, people can immediately begin checking
22 in. That is what is supposed to happen. That is what the
23 State Election Board rules require if the Poll Pads are not
24 working and if the BMDs are not working they should go right to
25 the emergency ballots or if the line is longer than 30 minutes.

1 Those are the existing regulatory structure that
2 needs to be implemented. And I know that there has been a very
3 conscious focus of state and county officials to make sure that
4 poll workers are ready and are trained on all of those points,
5 including those items.

6 THE COURT: Well, how are they checking people in if
7 they -- if the Poll Pads are not working --

8 MR. TYSON: Your Honor, they would --

9 THE COURT: -- under the State's rules? Because I
10 didn't hear that ever addressed other than what the plaintiffs
11 have suggested.

12 MR. TYSON: Yes, Your Honor. So the way the State
13 rule would work is you would immediately begin checking in
14 voters and the voters would be voters who were on the
15 precinct's list. There would be an indication on the list if
16 they have made an absentee ballot request up to the time that
17 the list is prepared.

18 But one of the challenges -- and I have never heard
19 the plaintiffs give a good answer to this question is -- if,
20 for example, the Poll Pads go down at noon and a voter who
21 voted at 8:00 A.M. comes back, the paper list is not going to
22 be updated for that fact.

23 So the remedy is you check everybody in and any sort
24 of alleged double voting that would take place can be handled
25 after the election through an election contest or some other

1 procedure. But that would be the way you would handle it.

2 And trying to -- the burden on the State that
3 Mr. Harvey talked about for doing this updated printing, it
4 really doesn't address the plaintiffs' concerns except if the
5 Poll Pads don't work right at opening.

6 THE COURT: Well, I think that there was the
7 alternative that he himself identified, which was not that the
8 State would print it but they would simply send basically an
9 electronic -- they would send it electronically to the county
10 for printing on that Saturday before the election. And he
11 seemed to think that was viable in my understanding of his
12 testimony.

13 MR. TYSON: And, Your Honor, I believe Mr. Harvey was
14 checking to see if that was technologically feasible using the
15 eNet system. I have not gotten an answer back on that point
16 yet. But that, I believe, was what he said, that it sounded
17 logical but he wasn't sure if it was an existing report that
18 was already created or we would have to get additional
19 programming done to generate that.

20 THE COURT: Okay. Well, I assume that there is a
21 straightforward answer then that you will be able to provide
22 today. I know you have been here with me. But I would like to
23 get the answer.

24 MR. TYSON: We'll do our best on that, Your Honor.

25 THE COURT: All right. And because, really, that

1 whole question of the -- what type of information is available
2 at the local polls, I think the plaintiffs are correct that we
3 have been discussing that really even from before December of
4 2019. And I have asked repeatedly, why is it not possible?
5 Can't you-all discuss it together? And it seemed like such an
6 important pragmatic step forward for dealing with -- we're
7 going to experience one of the largest crunches. And also
8 there is -- I mean, if you talk about confidence in the
9 election, clearly having a capacity to address such a crunch on
10 such a -- especially during a pandemic or really any time is an
11 important issue. And it is important for us to know if they
12 are capable of resolving it and that they don't care about my
13 ruling and want me not to be here.

14 Then I had a question about the State audit rule. I
15 understand the position of the State regarding, well, we are
16 doing something and this is a step forward and this is -- we're
17 using the State's position that there are disagreements in the
18 field as to how the audit should be done.

19 What I don't just factually understand is one of the
20 things that Dr. Adida says is basically if we -- if there seems
21 to be something funky about the data essentially, he says, and
22 it points to perhaps it not being reliable, well, we'll just
23 take some more -- we'll just keep on -- we'll get another batch
24 of ballots to look at until we can actually confirm.

25 Well, that is really part of what I was asking about

1 is the confirmation. Is this really simply going to be we're
2 going to get another group until we can say yes, it is.
3 Basically it is never, oh, there is a problem. It is always
4 we're going to get the amount until we can actually confirm
5 yes, the way I heard his testimony.

6 And I wanted to understand that. I wanted to
7 understand what the 90 percent confidence level was in this --
8 I think that is what is used in the rule. I don't have a
9 searchable copy of the rule.

10 So I can't -- I read it. Let's see. It is a
11 non-searchable version.

12 Anyway, do you want to respond? You probably know
13 what the confidence value is.

14 MR. TYSON: Yes, Your Honor. I'm trying to pull it
15 up myself as well here.

16 I think, Your Honor, one of the things that might be
17 helpful on this point -- I mean, the nature of a risk-limiting
18 audit is that the review of the ballot -- the paper ballot
19 continues to grow if you are not able to determine whether the
20 risk limit has been met all the way up to a full hand recount,
21 if necessary. I mean, that is kind of the way this ends is a
22 truly enforceable risk-limiting audit can get that far where we
23 have to go back and check every single -- every single
24 component.

25 And I believe our brief on the audit issue walked

1 through these issues in kind of great detail. So I would point
2 Your Honor --

3 THE COURT: All right.

4 MR. TYSON: -- to our brief on that point. But it is
5 because the nature of what ballot pulling risk-limiting audits
6 such that you are looking to see whatever that risk limit is
7 set at if you can achieve it based on the review of the paper
8 ballots that you have. If the answer is no, then you continue
9 counting -- hand counting up until a full manual recount of the
10 entire state, if necessary.

11 THE COURT: Well, as soon as you hit -- let's say it
12 is 90 percent, which is what I believed it was. As soon as you
13 hit 90, you stop? Or -- because it might be that at that point
14 if you added another 5000 you are back at 85 percent.

15 MR. TYSON: Yes, Your Honor. This is -- I found the
16 rule. It is ten percent. A risk limit of not greater than
17 ten percent.

18 And the way -- this, again, gets into statistics that
19 are far beyond my ability to comprehend them. And the Arlo
20 software that the Department of Homeland Security worked with
21 VotingWorks on in development does this kind of background
22 processing so you can determine based on the random sampling
23 that you have done whether or not you have reached that risk
24 limit or not.

25 And as Dr. Adida explained and actually I believe

1 Dr. Stark explained too in his supplemental declaration, you
2 recognize that that initial sample may not be quite right. But
3 like with pulling or other statistical processes, you can reach
4 a very high confidence level based on a subset of the entirety
5 of the ballots. And if you can't reach that, that is where you
6 continue growing your sample size as needed all the way.

7 THE COURT: Is there a reason why -- and I discussed
8 this particularly with Dr. Adida -- you never actually compare
9 the mark -- the barcode on a particular ballot with the
10 selections? You know, if there is a chance as we -- as we have
11 discussed before that the barcode mark is, in fact, imparting a
12 different number than the actual selections and that that is
13 one variation of malware that could occur or perhaps a
14 function, why wouldn't something as fundamental as that be
15 looked at on an individual ballot? Because we're not -- as he
16 testified, that is not part of the process.

17 MR. TYSON: And, Your Honor, I may be misremembering
18 Dr. Adida's testimony, but I thought that was part of the
19 process. Because when Mr. Rayburn explained the process in
20 March that the State was using, there was a pulling up of the
21 ballot. You were looking at both the audit mark, the human
22 readable portion. So the audit mark is the machine's
23 interpretation of what the QR code would be. And you were
24 determining from that if -- what is the human readable portion.
25 Are we counting that?

1 So I may be misrecalling the testimony on that point.
2 But that is my recollection on that, that that is part of the
3 review.

4 THE COURT: Well, I asked him specifically did he --
5 would you review the QR code again and see if it -- if it had
6 imparted other information. And he said no.

7 But we can all look at the transcript. I understand
8 what you are saying -- what Mr. Rayburn is saying. But that
9 was at -- it is a variation on this in light of also the work
10 that Dr. Halderman was doing to see with the QR codes.

11 MR. TYSON: Yes, Your Honor. I think they are not
12 going to rescan the ballots and see what the QR reading is.
13 That -- I mean, that may be what Dr. Adida is referring to.
14 But, anyway, I --

15 THE COURT: Well, he said he just -- we didn't need
16 to go back and look at that on an individual ballot basis. Of
17 course, he wasn't going to -- so that is what I'm getting at.
18 All right. Because that was specifically what I was asking
19 about is are you going to check the actual selections on
20 this -- on this ballot versus the QR code. And he said no.
21 And that was confounding to me as a matter of even for security
22 for -- I mean, people's sense of confidence. But maybe there
23 is some other explanation.

24 MR. TYSON: And, Your Honor, I know you had a
25 question earlier as well about tracking people who bring their

1 ballot back to the ballot marking devices to say that something
2 is not right about them. We were able to confirm with the
3 Secretary's office there is a spoiled and unaccompanied ballot
4 recap sheet that is collected with the information from
5 counties.

6 They don't report by machine, but they do report by
7 precinct and by ballot combination. So if you saw a particular
8 precinct and ballot combination where there was an extensive
9 number of errors, you could go back and work through and get
10 down to at least a grouping of machines from there.

11 THE COURT: Okay. Thank you. All right. Thank you
12 very much.

13 MR. TYSON: Thank you, Your Honor.

14 THE COURT: Mr. Cross?

15 MR. CROSS: Your Honor, yes. Before I start,
16 Ms. Cole, if she could pull up some slides that I'll reference.

17 If Your Honor wouldn't mind, I would appreciate a
18 little latitude on the time because there was a lot covered
19 there.

20 Ms. Cole, is it possible to go to slide view?

21 THE COURT: Is there something other than this first
22 screen?

23 MR. CROSS: This will work.

24 Ready, Your Honor?

25 THE COURT: Yes.

1 CLOSING ARGUMENT

2 MR. CROSS: Your Honor, the closing that Mr. Tyson
3 gave is so far removed from the facts of this case it is hard
4 to know where to begin. But let me just start with this notion
5 that we only offer recycled theories and speculation.

6 We are the only ones who have examined the new BMD
7 system who have knowledge it exists, that it is new, it is
8 different, and it needs to be inspected. Only us. Not one
9 election security expert has ever examined this system for the
10 State. Not one endorses it. They could not find one to
11 endorse this system.

12 On this issue of voter confidence, I will say this,
13 Your Honor. For Mr. Tyson to say in the public portion of this
14 hearing that we have shown no reason to doubt Georgia's system,
15 when he knows what the State has concealed during the course of
16 this hearing by their confidentiality objections, which we
17 think are totally unmerited -- to say that to the people is at
18 best misleading. And I will leave it at that.

19 The first slide, Your Honor, the entire defense that
20 the State has offered collapses. They have said that there is
21 no burden or only a slight burden on voters and they say for
22 two reasons. This is in the opening. Voters have the
23 opportunity to verify their ballots that are counted by the
24 scanners. That is simply not true. It is not even disputed
25 that that is untrue. You can't verify QR codes. And the

1 research their own expert put into the record showed that
2 voters are not adept at verifying ballots.

3 The second fact that they rely on or allegation is
4 that the ballots are then audited using a risk-limiting audit.
5 It is not disputed that that also is untrue. There is a single
6 audit for a single statewide election every other year.

7 So by their own argument, Your Honor, there is a
8 heavy burden on voters in this state.

9 Next slide. Ms. Cole, can you go to the next slide?
10 Sorry.

11 Just briefly on this, Your Honor, we started here.
12 They did not ask a single witness if this was true, that all
13 we're really asking for is to remove two pieces of equipment.
14 The most that we heard from any of their witnesses, Your Honor,
15 was, well, it may also involve some additional training. But
16 we know that is not accurate because they are already trained
17 on emergency paper ballots. It uses the same scanner.
18 Everything is the same from the moment they get the ballot.

19 And I'm going to jump ahead for time, Ms. Cole. If
20 you would just jump to slide three, if you would.

21 While she pulls that up, it is important to keep in
22 mind, Your Honor, that what we learned in the June 9 elections
23 is hand-marked paper ballots were used as emergency ballots
24 across the State.

25 The next slide, Ms. Cole. Sorry.

1 Cobb County, one of the biggest counties -- this is
2 one of the things we brought out during the course of the
3 hearing, Your Honor -- they had to use hand-marked paper
4 ballots across many precincts. This is from Ms. Eveler in an
5 email that we put into the record.

6 Your Honor is to think that the June 9 primary was
7 not a bigger disaster than it was because you had the foresight
8 a year ago to require an emergency backup plan. Without that,
9 the election on June 9 would have come to a halt at precinct
10 after precinct. Fortunately, the infrastructure is now there,
11 the people are trained, the paper ballots are there. All we're
12 asking for is just more ballots.

13 And, Your Honor -- Ms. Cole, if you would jump to
14 slide five. Next slide.

15 Mr. Barron himself took the stand and acknowledged
16 that at least as to election day having hand-marked paper
17 ballots would be simpler and easier. He practically asked Your
18 Honor to order it because the State won't allow him to do it.
19 And as the election director for the biggest county, if Fulton
20 can do this, there is no question that all the other counties
21 in the state, which deal with far fewer voters, can do it, Your
22 Honor, at least on election day.

23 Next slide.

24 And what did Mr. Harvey say about this? He said the
25 only thing he could come up with that would be tricky or

1 difficult is you would have to have a few stacks of paper
2 bigger than you normally have. Because instead of bringing out
3 paper ballots of ten percent of the anticipated vote, you would
4 have to have more. That is it. That is the only thing they
5 could come up with that they would have to do beyond what they
6 already do.

7 Next slide.

8 Their only other argument on this is to say, well,
9 maybe, kind of sort of we think we might not get enough
10 ballots. But we never asked anyone because we are really
11 scared that, of course, every ballot company in the dozens of
12 them across the country would, of course, commit to printing
13 these ballots. They don't ask the question because they know
14 the answer, Your Honor. There is no evidence of a ballot
15 shortage.

16 Next slide.

17 And they didn't tell Your Honor that the counties can
18 print the ballots themselves. Every county has at least one
19 printer. And some of them have many more, 200 to 250 ballot
20 printers on demand across the State that can print any ballot
21 style that they need.

22 So the point of feasibility, Your Honor -- their
23 entire argument is not supported by the facts, which is why
24 Mr. Tyson just does not address the facts in his closing.

25 Let me turn briefly to security, Your Honor.

1 Next slide.

2 Contrary to what Mr. Tyson said, there is, in fact,
3 an established, recognized standard in the election security
4 field for election technology like the system here.
5 Dr. Gilbert acknowledged it. It is called software
6 independence. You have to be able to determine whether your
7 system has been compromised in some way or simply isn't
8 operating right. If you cannot do that in a reliable way, then
9 it is not software independent.

10 Every expert who has examined this system -- our
11 experts -- said it is not software independent. Not one expert
12 from the defense said it is. Dr. Gilbert said it might be if
13 we assume that it is air gapped. And we're going to see that
14 it is not.

15 So here you have the State central defense that we
16 have heard time and time again. There is no evidence that the
17 old system was affected by -- infiltrates the new.

18 Next slide.

19 They even represented to Your Honor before that it
20 was air gapped. They were very precise about that. This is
21 State's defense counsel. But Dr. Coomer never said that or
22 anything close to air gapped. We now know --

23 Next slide.

24 -- that it is not even close to air gapped. This is
25 the same problem that we dealt with two years ago when

1 Mr. Barnes disclosed in a hearing that he was plugging a USB
2 drive into his internet-facing computer and then plugging it in
3 to the GEMS system.

4 Now they are telling people across the State --
5 Mr. Tyson did not characterize this email accurately. He said,
6 well, maybe it is one USB in one county. Look at what is being
7 asked for. The counties across the state, what are they
8 supposed to do for USB drives? Not just for L&A exports but
9 for election day exports. Just use the ones from the previous
10 system. They say, well, we don't really know what he means by
11 previous system. There is only one prior election system in
12 the state. And if Mr. Barnes had another explanation, we would
13 have seen an 11th hour declaration on that this morning too.
14 But we didn't. Everyone knows what this is about.

15 And it shows this system is just as compromised and
16 just as infected as the last one. And they like to tell Your
17 Honor there is no evidence of any hack on the old system. That
18 is just not true. Logan Lamb hacked it multiple times. Who
19 knows what else -- what anyone else was able to do with
20 nefarious intent.

21 The election director, Mr. Harvey, didn't even
22 mention any examination of this system. And the only thing
23 I'll say on this, Your Honor, because I haven't touched on it
24 is, Mr. Tyson asked Dr. Halderman if he agrees that well-run
25 organizations should constantly adjust to security threats.

1 Yes. That is the point of our case. What we have
2 learned is that in two years they have not done that at all.
3 Your Honor directed them last year to do that. They have not
4 done a single security assessment of this case, apart from one
5 they have withheld, which they said was only created for this
6 case. We have never seen it. No regular periodic -- not a
7 single assessment of this case in two years. And by
8 Mr. Tyson's own argument, that does not meet any kind of
9 professional standard for security.

10 THE COURT: You don't mean of this case? You mean of
11 the BMD system or the revision?

12 MR. CROSS: Yes. Thank you.

13 Next slide.

14 Just briefly, Your Honor, the only person they offer
15 who has actually looked at any part of this system is Mr. Cobb.
16 He is not an election security expert. He is not a security
17 expert at all. And every single thing he offered in his
18 original declaration to say the system is secure -- every
19 single allegation proved to be wrong, and he had to abandon
20 them.

21 He said you can rely on hash values. That was wrong.
22 Completely abandoned in his next declaration. He said keys
23 are -- barcodes are encrypted. Absolutely wrong. And
24 ultimately he was forced to admit in the last bit of testimony
25 here, Your Honor, that the time an election is happening when

1 we're underway the BMD system has everything it needs to
2 generate fake QR codes that no voter can detect. And then
3 nothing they have offered is going to detect when you have got
4 one audit for one election every other year.

5 Next slide.

6 Mr. Cobb also confirmed the simple attack that
7 someone can walk out with their ballot, as voters often do
8 because they are confused when the language says cast ballot
9 instead of print ballot -- but a nefarious actor could walk out
10 with it making many, many photocopies and distribute those
11 among people who have not yet come in to vote. And just
12 because the system will tabulate anything that is run through
13 it that has the QR code, it is easy to hack. This is stuffing
14 the ballot box.

15 Note the contradiction in their defense. They say,
16 well, you can't use hand-marked paper ballots because
17 someone -- insider they like to say -- so they are talking
18 about an election worker or someone at the state or county will
19 manipulate those.

20 Well, that same argument is why you can't rely on the
21 BMD system that they have offered up, Your Honor. The same
22 thing can happen. And the only defense they offer -- security
23 they offer for the equipment is to say, well, don't worry, we
24 have locked it down. Someone would have to come in and embed
25 malware. Someone would have to come in and embed the small

1 computer that Dr. Halderman developed.

2 But they are the ones that keep telling you you can't
3 trust insiders, that there can always be an insider that will
4 do that with hand-marked paper ballots.

5 And changing individual hand-marked paper ballots one
6 at a time, like they say, with a Sharpie, that is going to take
7 a whole lot more time than simply embedding a small computer in
8 a printer that no one sees or plugging a USB stick into a BMD
9 or an EMS server that then propagates across the system.

10 Next slide.

11 And we know that the system is not hardened. They
12 have no response as to why election computers and servers are
13 loaded up with video games that don't come standard that
14 someone decided to put on there. We are very far from a world
15 where this system is in any way secure.

16 Let me just close with audits, Your Honor. I think
17 Your Honor sees where we are going.

18 Next slide.

19 I think Your Honor hit the nail on the head on this.
20 This is from Mr. Tyson's opening statement. Mr. Tyson from the
21 start of this case acknowledged that audits are absolutely
22 irrelevant to the question that is before Your Honor right now.
23 They are not meaningful at all, which is the word Your Honor
24 used.

25 This is what he said, talking about the plaintiffs,

1 we cannot have an injury based on the outcome of an election,
2 as the Eleventh Circuit made clear in *Jacobson*, only their own
3 votes being counted. And why does that render RLAs entirely
4 irrelevant? Because every expert in this case agrees,
5 including Dr. Adida, that RLAs serve a singular purpose --

6 Next slide.

7 -- to validate election outcomes. That is it. That
8 is undisputed. So even if they had a robust RLA process across
9 the state -- and they don't. What they have -- it would be
10 laughable if we weren't talking about elections. All they can
11 do is tell you that the election outcome might be right. It
12 does not ever validate a vote. So they have nothing to offer
13 this Court in a network, an environment that is incredibly
14 compromised that is easy to hack and manipulate.

15 They have nothing to offer Your Honor to say we can
16 validate any individual vote. And Mr. Tyson was right from the
17 start of the trial. That is what this case is about. Not
18 election outcomes. So obviously if we can validate every
19 counted vote, then the election outcome flows from that. But
20 the injury that we're after is the one that Mr. Tyson
21 identified, election outcome -- RLAs are irrelevant to that.

22 I will just touch briefly on them because we spent so
23 much time.

24 Ms. Cole, if you would just jump to slide 19, the
25 second to last slide.

1 The two points on this, Your Honor. It is worth
2 noting --

3 Next slide.

4 -- none of their experts are willing to endorse or
5 even comment on the RLA process that has been adopted. They
6 told Your Honor in their brief that Dr. Adida's team helped
7 design the Georgia process. But when he was asked just a
8 singular question about that process, he said, I don't know
9 enough about the details of those plans to even comment on
10 them. The man who has supposedly designed it has so little
11 understanding of it he couldn't even comment on them.

12 Dr. Gilbert, whose original declaration last year
13 went on for pages about RLAs, now says I'm not going to offer
14 any opinions on RLAs in Georgia. Because what they have
15 adopted is so absurd that no self-respecting expert will even
16 go near it. That is where they have left themselves. No one
17 endorses this, just like the system.

18 Lastly, Your Honor, it cannot be overstated --

19 Next slide, Ms. Cole, if you would.

20 It cannot be overstated why RLAs, even in a reliable
21 system, simply cannot work with a BMD. This is Dr. Gilbert.
22 This is the Rice study that Dr. Gilbert himself offered up to
23 the Court from his own declaration. He represented to the
24 Court that the ability of voters to actually detect
25 manipulation of the voter choice is quite good. That is when

1 he said it is okay to rely on BMDs because they are good at
2 verifying their ballots. And he cites this Rice study in that
3 discussion in his declaration.

4 But what he did not tell Your Honor is that the 25
5 people that he references there were out of 108. He just
6 didn't disclose to the Court that the very study he cited is
7 contrary to what he represented. That what it showed was only
8 23 percent of voters were able to -- even made an attempt to
9 verify the ballots.

10 So in the world of BMDs, you are talking a very small
11 percentage of voters who can even try. And then among that
12 small quarter, a substantial portion of them were not good at
13 even detecting errors at all or maybe they detected one. In
14 fact, once we brought this out and he was asked about this
15 particular study, he said, I don't even want to be associated
16 with this study because it is not my work. This is the study
17 he directed Your Honor to in his written testimony in this
18 case.

19 Let me close with this, Your Honor. In 1954 in *Brown*
20 *vs. Board of Education*, the Court said, you cannot segregate
21 schools. A year later, states were back before the Supreme
22 Court saying this is really hard, dragging their feet, and
23 delaying the desegregation. The Supreme Court was quite clear.
24 This is a fundamental right. Do it with all deliberate speed.
25 That is what the Supreme Court said. Get it done with all

1 deliberate speed.

2 And they also said if you are going to come in
3 arguing that this is burdensome or difficult then the burden is
4 on you as the State. Because if you are going to tread on a
5 fundamental right like this or you are going to make
6 allegations of burden, then it is on you to prove those up.

7 And the same logic holds here, Your Honor. We
8 embrace our burden. But our burden -- our evidence cannot be
9 rebutted by simply Mr. Tyson or the other lawyers just making
10 claims, allegations for which they have no evidence, things
11 like, well, maybe we can't get printers or we can't get
12 ballots. Everything that they offer has no substantial
13 evidence behind it or any evidence.

14 And what we are asking Your Honor is as fundamental
15 as the right to education. It is more so. Because every right
16 starts with the right to vote, as the Supreme Court has
17 indicated.

18 So what we are asking for, Your Honor, is a system
19 that is the only system known today, particularly in the
20 environment in which the Georgia elections operate, in which
21 voters can have confidence. It is simple. It takes the
22 existing infrastructure, the existing training, and simply
23 rolls it out as they already are. They just need more ballots.
24 That is it.

25 Thank you.

1 THE COURT: Thank you. Well, let me ask you one or
2 two questions.

3 MR. CROSS: Yes.

4 THE COURT: Mr. Tyson accurately points out though at
5 a preliminary injunction hearing the plaintiffs bear a very
6 high substantial burden of proof and in this context to show
7 that their right to cast a vote has been burdened. And it is
8 not as you all say -- everyone says here it is not about
9 necessarily election outcome but about the burdening of the
10 vote and the exercise of it.

11 And it is also about in that connection that your
12 vote counts in the same way that anyone else's counts, that it
13 is -- that that is part of the equation. I might think that
14 some of the policies or regulations for handling of the
15 election processes by the State are inadequate in some way.
16 Some of them are perhaps very inadequate. Some of them
17 basically are still reflecting change that was -- never had
18 occurred before.

19 But -- and I might, you know, have a different policy
20 choice on all sorts of things. But why should I say at this
21 juncture -- what do you think is the most compelling point you
22 have that the plaintiffs have presented that the right to have
23 a vote cast and equally counted -- that individual voter has
24 been burdened impermissibly, with this high standard in mind?

25 MR. CROSS: To that I would say, Your Honor, that the

1 Supreme Court has been clear that burdening the vote unlawfully
2 includes eroding voter confidence. If voters cannot have
3 confidence in their vote, then that is a constitutional
4 deprivation.

5 With that standard in mind, I would say, Your Honor,
6 what we have presented is an environment specific to Georgia --
7 and let me be clear. Mr. Tyson has said before we're asking
8 Your Honor to invalidate BMDs across the country. Not so. Our
9 case is about Georgia. It is specific to the environment here.
10 We have --

11 THE COURT: What are you pointing to when you say
12 that it is enough to have invalidated confidence -- I mean, it
13 is certainly something -- all everyone here has been aware of
14 and concerned about perhaps, frankly, for everybody who cares
15 about our society and its health and well-being and future.

16 But tell me what case you are pointing to when you
17 say it is sufficient that they -- the way that they have
18 managed things have undermined voter confidence when they all
19 look to you and your clients as having undermined confidence --
20 voter confidence.

21 MR. CROSS: Let me make sure I understand Your
22 Honor's question.

23 THE COURT: Well, you, first of all, have said the
24 most important thing is that the State has -- in this
25 Georgia -- particular Georgia environment the State has

1 affected the right to vote because it has undermined voter
2 confidence because of the way they have handled the election
3 system. And I'm asking you what case do you rely on for that
4 proposition.

5 MR. CROSS: Oh, what case we rely on?

6 THE COURT: Yes.

7 MR. CROSS: I'm just going to pull that up, Your
8 Honor. It is the Supreme Court case that I referenced in my
9 opening.

10 MR. BROWN: That is *Saylor*.

11 MR. CROSS: Yes. Thank you.

12 I guess to get to your initial question, Your Honor,
13 that what is the most compelling evidence or fact, I would say,
14 one, you have Dr. Halderman's demonstration and then you have
15 that within an environment that has two pieces to it.

16 One, the recognized advanced persistent threats from
17 sophisticated nation states like Russia. So there is no
18 question that they are trying to get in. We now understand
19 they actually did get in in Florida, embed malware.

20 Then you have got the specific environment in Georgia
21 where they have not done any assessment -- any security
22 assessment in the state in two years, including with a
23 brand-new system.

24 And it is difficult to comprehend how you can roll
25 out a new system that has never been used on this -- on this

1 scale in any other state before and not bother to have a single
2 election security firm or expert come in and say, well, let us
3 just look at it, even on a cursory level, to see does it work
4 as it is supposed to. Is it hardened in the way that it needs
5 to be?

6 There is nothing I can imagine we would ever agree.
7 You wouldn't allow people to put vehicles on the road without
8 getting some sort of safety testing. We don't allow the state
9 to build bridges without some sort of safety testing. There is
10 nothing that we allow a government or private company to do
11 that has this kind of risk without not some basic safety and
12 security testing.

13 And they are asking voters to go to the polls without
14 ever having anyone look at it. And I said this before, but
15 there are only two possible explanations that I can come up
16 with. One is: They are as terrified as we are of what they
17 will find, which means they also don't have confidence in the
18 system as they claim, or they know how bad it is and they are
19 just turning -- they are keeping their heads in the sand, as
20 Your Honor told them two years ago not to do.

21 But that for me is the most powerful point, Your
22 Honor. We are beyond the dispute that the system is relatively
23 easy to compromise for the ones who are trying to compromise
24 it, very sophisticated actors. And no one has said -- no
25 one -- this system works and it is reliable.

1 I can't think of any other situation where we would
2 take something as fundamental as elections and say it is okay
3 to go forward under those circumstances. Just don't test it.
4 Nothing comes to mind.

5 THE COURT: Okay.

6 MR. BROWN: Your Honor, this is Bruce Brown. If I
7 may add one thought.

8 The confidence that we are looking for is not a false
9 confidence. It is not the confidence that will paper overrule
10 underlying deficiencies. It is true confidence. And today if
11 a voter votes on a BMD and then asks the State will you count
12 this correctly, if the State answered honestly, they would have
13 to say we have no idea. We will never be able to tell you if
14 we did or not. That is the --

15 THE COURT: Well, I'm sure Mr. Tyson would disagree.

16 MR. TYSON: Yes.

17 THE COURT: But thank you.

18 All right. Thank you, Counsel.

19 MR. CROSS: Thank you, Your Honor.

20 THE COURT: All right. Do we have your exhibits? We
21 don't have to do all of this publicly. Are there exhibits
22 that -- we don't have Mr. Martin here taking down if exhibits
23 have been admitted or not. And Ms. Cole has a job -- many
24 different roles.

25 But you haven't identified which exhibits have not

1 gotten in that you were trying to get in that I had a hold on.

2 MR. CROSS: Yes, Your Honor. I think there are a
3 few. We filed something last night. Let me just look at what
4 may still be outstanding.

5 THE COURT: Ladies and gentlemen, while counsel are
6 looking at this, I don't think we have any further substantive
7 proceedings here in terms of your observation. You are welcome
8 to stay while we are talking about exhibits. But no one will
9 be offended if you leave here.

10 I'm just trying to be -- and I appreciate that
11 everyone has been so engaged and interested. And I'll not be
12 announcing the decision today. These are challenging issues,
13 and they are challenging issues also in the context of under
14 governing law when there is an election so soon at this time.

15 But the reason I had this hearing is because I think
16 it is important that all circumstances be aired, whatever the
17 decision is, and -- and I'm -- frequently a federal district
18 court trial judge is not the final word on anything.

19 But I appreciate that there has been so much interest
20 in this. It is probably one of the more vital manifestations
21 of people engaged in democracy -- in the practice of it.

22 Thank you very much for attending and for your
23 interest. We're sorry again about the Zoom blast that happened
24 on Friday. And it is sort of the byproduct of still trying to
25 maintain an open society that things can go wrong like this.

1 And hopefully one day again we'll get to see you in open court.

2 Thank you.

3 MR. CROSS: Should we quickly touch on the exhibits,
4 Your Honor?

5 THE COURT: Yes.

6 MR. CROSS: The ones that I think that are not yet
7 moved or not yet admitted are PX 1, which is a Fayette County
8 ballot. I think, Bruce or Rob, that was one of you guys --

9 MR. BROWN: That was with -- with Mr. Gilbert as just
10 an example of a Fayette County ballot. I don't think there was
11 an objection to it.

12 MR. TYSON: No objection, Your Honor.

13 THE COURT: All right. It is admitted.

14 MR. CROSS: Then PX 9, this was the overview from
15 Dominion that Mr. Cobb quoted in his declaration for the QR
16 codes being encrypted. We only pulled up the cover publicly
17 because it is designated confidential. But we would move the
18 entire document in so Your Honor has it.

19 MR. McGUIRE: This is one that Mr. Skoglund talked
20 about as well.

21 MR. TYSON: No objection as long as the document
22 itself stays under seal. The cover page is fine.

23 MR. CROSS: Then the last two, Your Honor,
24 Plaintiffs' Exhibit --

25 THE COURT: All right.

1 MR. CROSS: I'm sorry.

2 THE COURT: What is being admitted on PX 9 -- I'm
3 sorry -- that you-all agree on?

4 MR. CROSS: The cover page can be made publicly
5 available. But the State wants the rest under seal.

6 THE COURT: All right.

7 MR. CROSS: The last two, PX 53, that was an
8 emergency ballot with some hand-marking. I think, Bruce or
9 Rob, one of you guys put that up.

10 THE COURT: Any objection?

11 MR. TYSON: No objection, Your Honor. I think that
12 is the ballot procedure from that Secure the Vote document.
13 But that is fine. No objection.

14 MR. CROSS: Thank you, Bryan. I think that is right.

15 THE COURT: Right. It is admitted.

16 MR. CROSS: Last one, PX 56, this is another Dominion
17 document where again we only put up the cover. Rob, I think
18 you had this one.

19 MR. McGUIRE: 56?

20 MR. CROSS: There were two Dominion documents that we
21 put the cover up on. One was the overview Mr. Cobb quoted, and
22 then there was another one.

23 MR. McGUIRE: I don't -- Bruce, I don't know if you
24 used 56. I don't think 56 was one of mine. We used 54.

25 THE COURT: Was 54 admitted?

1 MR. MCGUIRE: I believe it was.

2 MR. CROSS: Yes, 54 was admitted.

3 THE COURT: Well, like, for instance, 53 is admitted
4 or the cover page in PX 9 -- you are going to have the rest of
5 it be under seal?

6 MR. TYSON: Yes, Your Honor.

7 THE COURT: All right. Okay. Fine.

8 All right. Well, if you figure out about 56, you can
9 let us know.

10 Mr. Tyson, (unintelligible) --

11 MR. TYSON: I'm sorry, Your Honor. You broke up.

12 THE COURT: Are there any of the defendants' exhibits
13 that need to still be admitted?

14 MR. TYSON: I believe we had Exhibit 11, which was
15 the hand recount story, and there was an Exhibit 12 that was
16 the stills from the video that we'll file under seal.

17 THE COURT: Right. What is the hand recount story?

18 MR. TYSON: From Savannah where the state house -- I
19 talked to Dr. Halderman about it. The hand recount of the
20 state house election.

21 THE COURT: I have to review that before I let it in.
22 It is a newspaper article. After all, you were objecting to
23 also even just actual academic studies coming in. You can
24 examine somebody without having an article come in itself.

25 So I'm not inclined to. But I will look at it if you

1 want.

2 Holly, do you know which one that is?

3 What was the exhibit again, Mr. Tyson? And I will
4 look at it.

5 MR. TYSON: It is filed at 893-2.

6 THE COURT: All right. I'll look at it afterwards,
7 and I will let you-all know. But I'm not inclined to admit it.

8 MR. McGUIRE: Your Honor, we used DX 4. I'm not sure
9 if that was admitted or not. But we would --

10 THE COURT: What was DX 4?

11 MR. McGUIRE: It was the -- Michael Barnes' draft
12 document on scanner settings.

13 THE COURT: Are you seeking to admit it?

14 MR. McGUIRE: If it isn't already admitted, we would
15 seek to admit it, yes.

16 MR. TYSON: We don't have an objection to that, Your
17 Honor.

18 THE COURT: All right. Admitted.

19 MR. McGUIRE: We had also submitted 61 -- PX 61 and
20 PX 62. Those are the articles that Mr. Tyson was just
21 referring to, I believe.

22 THE COURT: All right. I'll look at those. The one
23 I was referring to?

24 MR. McGUIRE: Yes, ma'am, you were referring to.

25 THE COURT: Well, I'll look at all three articles,

1 and I'll let you-all know.

2 MR. TYSON: Then, Your Honor, also those stills from
3 the inspection video under seal but --

4 THE COURT: All right. You were going to get back to
5 me this afternoon about the question I posed to you; right?

6 MR. TYSON: Your Honor, I have already sent it to the
7 Secretary's office. So they are working on it right now.

8 THE COURT: All right. Thank you very much. I know
9 it has been a lot of work for you-all. I appreciate the
10 excellent really work you have done and your advocacy and the
11 strength of your beliefs on all sides and commitment to your
12 clients.

13 And if we have any questions, I will let you know.
14 It has been a challenging thing to do this by Zoom. And I very
15 much appreciate everyone's professionalism as we have tried to
16 navigate together over the last period of time, in the
17 particular last few days.

18 Is there anything else we should address at this
19 time?

20 MR. CROSS: Your Honor, I think we may have figured
21 out the exhibit, just while we have got you. So Exhibit 56 --
22 I think I have it confused. My apologies.

23 Exhibit 56 is the November 2019 Democracy Suite
24 system overview. I think that is the one we used and the one
25 that Mr. Cobb quoted from. Exhibit 9 is -- let me pull it up

1 now. That is the Windows build document.

2 MR. McGUIRE: That one is admitted, I think.

3 MR. CROSS: Right. That was the one that --

4 THE COURT: You are looking to admit the
5 November 2nd, 2016, documentation that Mr. Cobb relied on?

6 MR. CROSS: Yes. It is 2019. But that is right.
7 Again, it would only be the cover page because it is designated
8 confidential. So Exhibit 56, the cover page could be public
9 but the rest would be under seal, according to the State.

10 THE COURT: So let me ask you this just in terms of
11 the -- did you give them to us as two separate documents all
12 the times that you are saying just the cover page or are we
13 supposed to be scanning it ourselves to make these? How do you
14 perceive this happening pragmatically.

15 MR. CROSS: We, I think, have publicly filed all of
16 the exhibits. And for Exhibit 9 and 56, we filed just the
17 cover sheet.

18 THE COURT: All right.

19 MR. CROSS: I'll confirm that.

20 THE COURT: Everything else under seal?

21 MR. CROSS: Then the rest would be under seal with
22 the Clerk.

23 THE COURT: All right. Were they filed under seal
24 before?

25 MR. CROSS: No. We will put in a sealed filing for

1 those. I don't think we have done that yet.

2 THE COURT: Is that okay with you, Mr. Tyson, and is
3 there anything that you were submitting that was sealed?

4 MR. TYSON: That is fine with us, Your Honor. I
5 think the one we have under seal is the Exhibit 12. So I will
6 file that under seal here shortly.

7 THE COURT: All right. Ms. Cole, is there anything
8 else that you can spot or think of?

9 LAW CLERK COLE: No.

10 MR. CROSS: Your Honor, I guess one other question.
11 To Mr. Brown's point at the start of the day that the
12 plaintiffs will move to unseal this, we don't want to distract
13 from the far more pressing point that Your Honor needs to make
14 a decision on the motion.

15 What is your preference of timing and how we would do
16 that? We do think it is --

17 Go ahead.

18 THE COURT: I don't have a preference. I have to
19 deal with what you-all have put in front of me.

20 MR. CROSS: Right.

21 THE COURT: And I have -- you know as with -- well, I
22 don't know. I think Mr. Tyson must be dealing with elections
23 full time and nothing else and his colleagues. But I do have
24 plenty of work that is not elections that I have got to get to.

25 So, you know, I realize on a time-sensitive basis you

1 want me to rule on that. So, you know, you just will have
2 to -- obviously proceed as soon as you can. But I can't tell
3 you that I'm going to be able to rule on it that much faster.
4 I mean, I'm happy to give you-all a shorter period of time
5 because you want to deal with it. But I can't predict exactly
6 when I will be able to turn it around.

7 MR. CROSS: Understood.

8 MR. BROWN: Thank you, Your Honor.

9 THE COURT: Yes? Mr. Brown, were you saying
10 something?

11 MR. BROWN: No. I just said thanks.

12 THE COURT: I think that is probably -- there is a
13 lot that the State has to deal with -- State counsel. So I
14 think the better thing is to file it ASAP and then I just won't
15 grant an extension and they can have their 14 days. That seems
16 to me the more sensible way of proceeding, since everyone is
17 under enormous pressure just to get this hearing happening.

18 MR. CROSS: Thank you, Your Honor.

19 MR. TYSON: Your Honor, also we just want to say on
20 behalf of all of us on both sides thank you to Ms. Welch and
21 Ms. Cole for heroic work in this. Thank you.

22 THE COURT: They were terrific.

23 All right. If I have any other questions, I will let
24 you-all know. Thank you also. Be well.

25 MR. CROSS: Thank you, Your Honor.

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MR. TYSON: Thank you, Your Honor.

MR. BROWN: Thank you.

THE COURT: All right. Take care. Bye-bye.

**(The proceedings were thereby concluded at 3:25
P.M.)**

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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 198 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 15th day of September, 2020.

Shannon R. Welch

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