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5 COMMITTEE ON ENERGY AND COMMERCE,

6 U.S. HOUSE OF REPRESENTATIVES,

7 WASHINGTON, D.C.

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12 INTERVIEW OF: TAKASHI OGAWA AND HIROHISA KISHI

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17 Thursday, March 18, 2010

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19 Washington, D.C.

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22 The interview in the above matter was held at Room 316,

23 Ford House Office Building, commencing at 1:15 p.m.

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1 Appearances:

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4 For COMMITTEE ON ENERGY AND COMMERCE:

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6 DAVID J. LEVISS, Chief Oversight Counsel

7 MEREDITH FUCHS, Chief Investigative Counsel

8 ANNE TINDALL, Counsel

9 KAREN E. CHRISTIAN, Minority Counsel

10 KEVIN M. KOHL, Minority Professional Staff

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1 Ms. Tindall. Good afternoon. On behalf of the
2 Committee on Energy and Commerce, I thank everyone for being
3 here today.
4 This is a transcribed interview of Takashi Ogawa and
5 Hirohisa Kishi. The chairman of the committee has sought
6 this transcribed interview as part of the committee's
7 investigation into complaints of sudden, unintended
8 acceleration in Toyota-made vehicles.
9 Mr. Ogawa, would you please state your full name for the
10 record?
11 [All responses of Mr. Ogawa and Mr. Kishi were delivered
12 through an interpreter.]
13 Mr. Ogawa. I am Takashi Ogawa.
14 Ms. Tindall. And, Mr. Kishi, would you also state your
15 name for the record?
16 Mr. Kishi. I am Hirohisa Kishi.
17 Ms. Tindall. My name is Anne Tindall. I am counsel
18 with the Committee on Energy and Commerce.
19 If we could have others in the room also identify
20 themselves.
21 Mr. Hester. I am Ted Hester. I am here representing
22 Mr. Ogawa and Mr. Kishi, from the law firm of King &
23 Spalding.
24 Mr. Galvin. My name is Vincent Galvin.
25 Mr. Bishop. I am Doug Bishop. I am managing counsel

1 for Toyota Motor Sales.

2 Mr. Kohl. Kevin Kohl, minority professional staff

3 member.

4 Ms. Christian. Karen Christian, counsel with the

5 Republican staff.

6 Ms. Fuchs. I am Meredith Fuchs. I am chief

7 investigative counsel.

8 Mr. Van Buren. I am Rick Van Buren. I am an intern

9 with the Energy and Commerce Committee.

10 Mr. Leviss. I am David Leviss. I am the new chief

11 oversight counsel to the committee.

12 And, Ted, if you could have the two interpreters who are

13 observing identify themselves.

14 Ms. Poland. My name is Setsuko Tahara Poland. I am

15 from California.

16 Ms. Takada. My name is Koko Takada.

17 Ms. Tindall. Before beginning with questioning, I would

18 like to go over some standard instructions and explanations

19 regarding the interview.

20 Under committee guidelines for transcribed interviews,

21 you are permitted, if you choose, to have personal counsel

22 attend the interview. Do you understand that?

23 Mr. Ogawa. Yes.

24 Mr. Kishi. Yes.

25 Ms. Tindall. Have you chosen to have personal counsel

1 attend this interview?

2 Mr. Ogawa. Yes.

3 Mr. Kishi. Yes.

4 Ms. Tindall. Are you comfortable being represented by

5 counsel for Toyota, Ted Hester?

6 Mr. Ogawa. We are fine. We are comfortable.

7 Ms. Tindall. An official reporter is taking down

8 everything we say to create an official record of the

9 interview. To assist the reporter in making a clear record,

10 please wait until I finish my question before you start your

11 answer.

12 The committee has retained the services of a Japanese

13 interpreter to assist in this interview. Will you let me

14 know if you have any concerns about the translation process?

15 Mr. Ogawa. We have no concerns.

16 Mr. Kishi. No concerns.

17 Ms. Tindall. And the court reporter's record of the

18 interview will be the official record of the interview. As

19 we have discussed with your counsel, there is to be no other

20 recording of this interview. Do you understand that?

21 Mr. Ogawa. Yes.

22 Mr. Kishi. Yes.

23 Ms. Tindall. You are required by law to answer

24 questions from Congress truthfully and knowingly. Making a

25 false statement to Congress could subject you to criminal

1 prosecution. Do you understand that?

2 Mr. Ogawa. Yes, I do understand.

3 Mr. Kishi. Yes.

4 Ms. Tindall. Is there anything that would prevent you

5 from answering questions truthfully today?

6 Mr. Ogawa. No, there isn't.

7 Mr. Kishi. There isn't.

8 Ms. Tindall. I will begin asking you questions on

9 behalf of the committee. And after about an hour -- we will

10 see how long -- we will take a break. At that point, staff

11 with the minority may begin to ask questions, or it might

12 make sense to continue with my questioning.

13 We will make every effort not to take up any more of

14 your time than we need to to collect the information for our

15 investigation.

16 Do you have any questions before we begin?

17 Mr. Hester. Mr. Ogawa and Mr. Kishi have prepared an

18 initial presentation that they think would be helpful to you,

19 if that is permissible.

20 Ms. Tindall. That is permissible. I was hoping to ask

21 a few questions about their background first and then proceed

22 with that.

23 Mr. Hester. Certainly.

24 Ms. Tindall. Does either Mr. Ogawa or Mr. Kishi have

25 any questions about the process?

1 Mr. Ogawa. No.

2 Mr. Kishi. No.

3 EXAMINATION

4 BY MS. TINDALL:

5 Q Beginning with Mr. Ogawa, I do understand you have
6 prepared a presentation, but, before we begin, I would like
7 to know a little bit about your background. We have, from
8 your counsel, a summary of your background, and I just have a
9 few questions.

10 I see from the information provided that you have been
11 employed by Toyota since 1982. Is that correct?

12 Mr. Ogawa. That is correct.

13 Q And is your current title Electronics Development
14 Division 2 General Manager?

15 Mr. Ogawa. Yes.

16 Q What are your responsibilities in that position?

17 Mr. Ogawa. I design and develop electronic components
18 for control systems.

19 Q And are there particular components for which you
20 are responsible?

21 Mr. Ogawa. I am in charge of things such as engine ECU,
22 electronic throttle control ECU, brake ECU, power-steering
23 ECU, and things like that.

24 Q And are you also responsible for the testing of
25 these systems?

1 Mr. Ogawa. At Toyota, design essentially requires
2 testing, so we are responsible for test results. And so you
3 can certainly consider me as being responsible for testing,
4 as well.
5 Q Are you also responsible for any testing that goes
6 on after a design is completed?
7 Mr. Ogawa. Once a design is completed, we test it to
8 make sure there is no problem. And that really, in a sense,
9 is completion of a design. So I am responsible up to that
10 stage.
11 Q How long have you been in your current position?
12 Mr. Ogawa. I believe it has been 6 years.
13 Q And were your previous positions within Toyota also
14 related to the design and testing of control systems?
15 Mr. Ogawa. Yes. Prior to that, I was also in the same
16 department, and I was working on the same things.
17 Q I will now move to ask Mr. Kishi a couple of
18 questions.
19 It is my understanding from information provided by
20 Toyota's counsel that you joined Toyota in 1984. Is that
21 correct?
22 Mr. Kishi. Yes.
23 Q Can you state your current title?
24 Mr. Kishi. I am the General Manager of the Engine
25 Management Systems Development Division.

1 Q What are your responsibilities in that position?
2 Mr. Kishi. I construct or develop control strategies
3 for engine controls, and I also am responsible for several
4 engine components. And, in relation to this case, I handled
5 the throttle motor assembly.
6 Q Within those responsibilities, do you also have a
7 role in the testing of these systems?
8 Mr. Kishi. In my development work, we do conduct
9 testing in order to formulate what sort of control we are
10 going to develop. I don't know if you can call that testing,
11 but I am involved in development.
12 Q How long have you been in this position?
13 Mr. Kishi. Slightly less than 2 years. I had spent an
14 additional year prior to that for electronic throttle.
15 Q And what responsibility did you have with regard to
16 the electronic throttle in that previous year?
17 Mr. Kishi. Same as what I have today, or now.
18 May I add something?
19 Q Sure.
20 Mr. Kishi. The organization was changed, so I maintain
21 my work, old work, and then additional work was added to
22 that.
23 Q Okay.
24 I don't have additional questions about background.
25 Perhaps we should let Karen ask some questions before we move

1 on.

2 Let me clarify the statement you just made. I

3 understood you to be saying that you had been working on the

4 electronic throttle, and then, after a year, your work was

5 expanded to include the development of strategies for the

6 engine controls, the other work that you described to begin

7 with. Did I understand that correctly?

8 Mr. Kishi. To be precise, the first year we were

9 talking about, it is not limited to just electronic throttle.

10 That was just one of many work that I had.

11 Q And then you said that the organization changed and

12 you received additional work. What additional work were you

13 referring to?

14 Mr. Kishi. The additional work had to do with diesel

15 engine control and some of the related components.

16 EXAMINATION

17 BY MS. CHRISTIAN:

18 Q For Mr. Ogawa, you stated earlier that you do

19 testing after the design is complete to ensure that there are

20 no problems, and at that point the design is considered

21 complete. Do you do testing of systems once the car is on

22 the market?

23 Mr. Ogawa. If a car is introduced into the marketplace,

24 that means the design had been completed, so I do not do any

25 more testing.

1 I would like to make a clarification. As I was
2 explaining my current responsibilities, I was listing things
3 such as power steering and airbags, but currently I do not
4 handle airbags.
5 Ms. Tindall. We can move on now to your presentation.
6 [Mr. Ogawa delivers his presentation in English.]
7 Mr. Ogawa. Good afternoon. As you already know, my
8 name is Takashi Ogawa. And you already know his name is
9 Hirohisa Kishi, so let me skip.
10 We are here to answer your questions regarding
11 specifications, design, and evaluation of ETCS. In order to
12 explain thoroughly and answer your questions completely, we
13 will speak in Japanese and utilize a translator. Thank you
14 for your patience regarding this complication.
15 I forgot a very important thing. First of all, I should
16 say that I would like to thank you for the opportunity to
17 explain more about Toyota. Thank you very much.
18 Today we will review the ETCS design strategy for how
19 should the system work, by him, and then ETCS components and
20 system evaluation, including several specific examples for
21 the 2007 Camry, by myself.
22 If there are any questions, please ask at any time. So,
23 first, Kishi will explain the design strategy.
24 [Mr. Kishi delivers his presentation in Japanese.]
25 Mr. Kishi. I am Kishi. I am handling design strategy

1 and am responsible for design strategies. Thank you for
2 giving us the opportunity to explain our system today.
3 This diagram shows a basic structure of the electronic
4 throttle control system. When a customer depresses an
5 accelerator pedal, accelerator petal position censor outputs
6 a signal. That signal would go through the computer and onto
7 the circuit that operates a motor, and then eventually moves
8 the throttle valve.
9 This section that I just circled is the section that
10 replaced the conventional wire cable. By replacing this
11 throttle valve movement using the electronic control, we were
12 able to make many functional improvements. I will explain
13 four such functions.
14 First one is that there are no more mechanical failures
15 for wires, or the mechanical that moves the wire.
16 The second one is, by the utilization of what is known
17 as VSC, which is the vehicle stabilization control, by using
18 that system, we were able to improve the driving safety.
19 The third benefit was to improve functions such as
20 cruise control, which is very convenient for customers.
21 The fourth, the last one is that this system allows for
22 advanced emission control.
23 On the other hand, for customers or drivers, there may
24 be instances where the feeling the drivers get do not match
25 what he or she expects. It is our thinking or belief that,

1 regarding that issue, I don't think we were communicating
2 fully with our customers.
3 One example of such misunderstanding would be a small
4 snock that the customer might feel when the fuel supply is
5 cut once and then it resumes the operation, or a series of
6 small controls that are conducted in order to improve the
7 durability of catalyst.
8 Ms. Tindall. The durability of what?
9 The Interpreter. Catalyst.
10 Mr. Leviss. What does that mean?
11 Mr. Kishi. All automakers use catalyst to clean the --
12 Mr. Leviss. Catalytic converter?
13 Mr. Kishi. Yes. Thank you.
14 Should I continue to give you more explanation or go on
15 with the presentation?
16 Ms. Tindall. Go on.
17 Mr. Kishi. Do you want me to continue with the
18 catalytic converter or presentation?
19 Ms. Tindall. No, the presentation.
20 Mr. Kishi. After replacing the wire with this system,
21 we added six features in order to increase the redundancy.
22 First one is the accelerator sensor and the throttle sensor,
23 we have double sensors, redundant systems. Additionally, the
24 second one is that we have two computers, two microcomputers.
25 They monitor each other's operations.

1 And one of each two sensors that we have also feeds into
2 the sub computer and make the sub computers run the same
3 calculations, as well.
4 Ms. Tindall. Excuse me, can I ask a question?
5 Were you saying that both accelerator pedal sensors and
6 both throttle position sensors speak to the sub CPU, or does
7 one speak to one CPU and one speak to the other?
8 Mr. Kishi. Only one of the two accelerator sensors and
9 one of the two throttle censors goes to sub computer.
10 Mr. Ogawa. But the main computer monitors all four
11 signals from all the censors.
12 Ms. Tindall. And then what did he say?
13 The Interpreter. "I was just about to say that," is
14 what he said.
15 Mr. Kishi. I will repeat. So the main computer does
16 four calculations in total, and sub computer does two
17 calculations.
18 The fourth feature is that, by using the calculation
19 value obtained from the main computer, the throttle sensor
20 indicated value is compared against the calculated value.
21 [The interpreters confer.]
22 The Interpreter. Correction:
23 Mr. Kishi. The main computer is always comparing the
24 value that is calculated by the computer and a value that is
25 indicated by the throttle sensor. And similarly, the sub

1 computer also is comparing the calculated value with the
2 output. In other words, it is always monitored so that the
3 output value from the throttle valve matches with the
4 calculated value.
5 The fifth feature is such that if there is any anomaly
6 in the system, both main and sub computers shut down the
7 electrical communication to the motor. So either main or sub
8 computer can shut down electrical power transmission.
9 If you can look at this. So we have a strong spring
10 here, so, at that time, the valve shuts like that because of
11 the spring.
12 The sixth feature is that when some object is caught
13 between the valve and the tube, then the engine will detect
14 that and cuts off the fuel supply.
15 [The interpreters confer.]
16 The Interpreter. He just said engine, but the second
17 interpreter says it is the system, and I verified with the
18 witness that by "engine" he meant engine control unit.
19 Ms. Tindall. Can you just repeat that sentence and let
20 us try one more time?
21 Mr. Kishi. So if some object is caught in the throttle
22 valve, then the engine control system detects the fact that
23 something is caught in the valve and cuts off the fuel
24 supply, thereby stopping the engine.
25

1 RPTS SCOTT

2 DCMN HERZFELD

3 [2 p.m.]

4 BY MS. TINDALL:

5 Q What might get caught in a throttle valve?

6 Mr. Kishi. Normally that's very rare something gets

7 caught, because we have an air cleaner. If there was

8 anything to be caught there, in a cold region, there might be

9 ice crystals, pieces of ice that can get caught, but we do

10 also evaluate those instances as well.

11 So, using this highly redundant system, we then use FMEA

12 to identify all of the fail modes. The list that we have

13 prepared shows all of the conceivable UAs, unintended

14 acceleration.

15 The Interpreter. Okay. So the correction is on the

16 second part of the testimony.

17 Mr. Kishi. After identifying all of the fail modes, we

18 identified all of the conceivable, possible, unintended

19 acceleration events.

20 Ms. Poland. Can I offer my interpretation?

21 Mr. Leviss. To her, yes. The committee's interpreter

22 is the ultimate interpreter.

23 [The interpreters confer.]

24 The Interpreter. Okay. So I am going to start all

25 over.

1 Mr. Kishi. So, using this highly redundant system, then
2 we used FMEA to study all of the fail modes, and then we were
3 able to identify the fail modes that could lead to unintended
4 acceleration, and conducted FTA, which is the fault tree
5 analysis, and the chart shows that.
6 Ms. Tindall. Can we mark the chart as Exhibit 1?
7 [Ogawa/Kishi Exhibit No. 1
8 was marked for identification.]
9 BY MS. TINDALL:
10 Q Could I ask a question about this chart?
11 Mr. Kishi. Yes.
12 Q Was this prepared for purposes of this
13 presentation, or was it an existing Toyota document?
14 Mr. Kishi. We had it in presence in Toyota.
15 Q In English?
16 Mr. Kishi. The original is in Japanese, of course.
17 Q But the translation existed before you began
18 preparing for the presentation, and you are just using it as
19 part of your presentation?
20 Mr. Kishi. That's correct.
21 Q That's correct. Okay.
22 Who created it?
23 Mr. Kishi. How should I explain this?
24 Well, the basic structure -- or basic idea about this
25 system was developed over 10 years ago, so that was the

1 beginning of the development at that time, and so the members
2 who were developing strategies at that time created this
3 document.
4 Q So the document would be about 10 years old; is
5 that right?
6 Mr. Kishi. I wasn't responsible for this at that time,
7 so I cannot give you exactly how long ago this was prepared.
8 Q But several years ago?
9 Mr. Kishi. Yes.
10 Mr. Hester. Did you ask whether it is the document or
11 the information in the document?
12 Ms. Tindall. The document.
13 Mr. Kishi. I'm not so certain about the English
14 version.
15 BY MS. TINDALL:
16 Q But the Japanese version was created several years
17 ago for what purpose?
18 Mr. Kishi. Considering these type of control strategies
19 in order to facilitate the development work, the systematic
20 development work. As shown on this chart, for all of the
21 failure modes, we provide fail-safes, and that is how we
22 develop the control system. That's all.
23 Mr. Ogawa. Should we move on with my --
24 Ms. Tindall. I think, though, I might have some
25 questions about this document later, but we might as well

1 keep going.

2 Mr. Ogawa. Mr. Kishi has just explained the design
3 strategies based on the FTA. Now I will take over and
4 explain the testing, which is the subject of this interview.

5 First, I would like you to understand something. It may
6 be hard to understand, but there is no particular or special
7 testing that would directly prove that there is no unintended
8 acceleration. Thus, we are hoping to demonstrate that by
9 conducting the two testing that I am going to explain.

10 The first method is to conduct testing under all
11 conceivable conditions to confirm that there is no instance
12 of unintended acceleration. The second method is to confirm
13 that the design that Mr. Kishi just explained is correctly
14 realized as a design and also correctly operates in various
15 environments. By conducting those two things, we confirm
16 that there are no instances of unintended acceleration.

17 I had already submitted this yesterday, but using this
18 flow chart, I will explain the testing process.

19 Ms. Tindall. We are going to mark this chart Exhibit 2.

20 [Ogawa/Kishi Exhibit No. 2
21 was marked for identification.]

22 Mr. Ogawa. Our testing is divided into a vehicle test
23 and component test, and the component test is further divided
24 into function, for functionality testing, and reliability
25 testing. The function testing of the component test also

1 includes the testing of electronic circuits, but mainly they
2 do the software testing. The reliability test is divided
3 into a hardware test and EMC test, but the hardware test is
4 conducted using the actual parts, or components. So this is
5 not the simulations that you do on your own PC.
6 We are able to test under severe conditions, which
7 cannot be realized using the actual vehicle. We were able to
8 do that on the bench. So we go through a great number of
9 items for this hardware test, and in the case of electronic
10 throttle control system, we require 54,000 hours to test all
11 of the items for electronic throttle computer. I will
12 explain about the EMC test later.
13 As far as the vehicle test is concerned, it is also
14 divided into function test and reliability test. The
15 function test, which mainly focuses on software testing,
16 which is indicated by function test, and the OBD test,
17 onboard diagnostic test, confirms that sensors, without fail,
18 detect all anomalies.
19 The Interpreter. Can I hear what I said?
20 [The preceding answer was read back.]
21 The Interpreter. I'm sorry. The subject was missing,
22 so I got confused. I would like to have the witness repeat
23 his answer.
24 [The interpreters confer.]
25 The Interpreter. Okay. Then I will correct the answer

1 about the OBD testing based on the additional information
2 that I just received from the witness.
3 Mr. Ogawa. The microcomputer -- we conduct this OBD
4 test to make sure that the microcomputer detects all of the
5 anomalies, with respect to sensors, without any fail.
6 For example, we have two accelerator pedal sensors, and
7 it is critical to detect all of the abnormalities occurring
8 with these sensors so that we can provide fail-safes.
9 Also, we do a normal operation test, which are unusual
10 things that might occur to the engine. For example, while
11 you are running at the 50 kilometers per hour, you shut down
12 the engine, or while the engine is idling, you turn the
13 engine on, something like that.
14 The Interpreter. I think I got that right.
15 Mr. Ogawa. While the engine is idling, you
16 intentionally press the start-up button on -- or press the
17 start-up button.
18 On the reliability test, at the end, is using the actual
19 vehicle. We just drive the car over several thousands of
20 miles in hot region and cold region. The document we
21 produced includes some examples. It doesn't include every
22 example, but examples of those testings that I just
23 explained, the test result --
24 BY MS. TINDALL:
25 Q Which documents are you talking about?

1 Mr. Ogawa. Here.

2 Q In the spiral-bound? Okay.

3 Mr. Ogawa. And I will explain now the EMI testing and

4 also software that, I suspect, you might be most interested.

5 Mr. Hester. You are referring to this document?

6 Mr. Leviss. It's attached. It's the second page of

7 Exhibit 2. Is that what you're referring to now?

8 Mr. Ogawa. It says Philosophy of Toyota.

9 BY MS. TINDALL:

10 Q Yes, that's the second page of Exhibit 2.

11 About how much longer do you expect this part of this

12 presentation to go?

13 Mr. Ogawa. I will probably take 10 minutes speaking

14 alone. With interpretation, I don't know.

15 Q Okay.

16 Mr. Hester. Explain those numbers.

17 Mr. Ogawa. Before moving on to that, I would like to

18 explain the numbers on the first page. Oh, these numbers

19 match the tab numbers in this binder.

20 Ms. Tindall. Okay. So the testing materials for each

21 one of these tests is behind the tab.

22 EXAMINATION

23 BY MR. LEVISS:

24 Q So, if I can clarify this, Mr. Ogawa, on the first

25 page of Exhibit 2, there are a series of numbers, 1 through

1 8, in circles. You're saying that each of those numbers
2 refers to a tab in the binder of material that you've
3 provided to the committee for assistance in this interview?
4 Mr. Ogawa. Correct.
5 Mr. Hester. Those are examples of many other tests.
6 Ms. Tindall. Okay.
7 Mr. Ogawa. So these are not all.
8 Ms. Tindall. Right.
9 Mr. Ogawa. Then I will move on to the explanation about
10 the EMI, and I'm going to start with the second line on this
11 page. So I am going to skip the explanation about the EMC
12 and the first numbered item. I am going to start with the
13 immunity, explaining the immunity.
14 When you are subjected to electromagnetic wave, you
15 don't malfunction -- misoperation or malfunction. This is
16 Toyota's basic concept. This is Toyota's basic concept, but
17 we ensured the performance on the component level first, and
18 then we install those components onto an actual vehicle and
19 confirm their performance in an actual car.
20 The second item describes the Toyota method, or it
21 generally outlines the Toyota method. As a method, they all
22 conform with ISOs and international standards and SAE as
23 well.
24 But as a determination criteria, we employ more
25 stringent standards because our aim is to secure or to ensure

1 the high level of performance on the components level. So we
2 place a component in a 200-volt-per-meter electromagnetic
3 field. Not only that, we have the component operate, and we
4 monitor the outputs.
5 The commercially available transmitter is modified so
6 that its output is twice as much as the commercially
7 available transmitter available in the market, and so we use
8 that device to irradiate the electromagnetic wave --
9 The Interpreter. Correction:
10 Mr. Ogawa. So we modified a commercially available
11 transceiver so that it has twice as much output, and we use
12 that device to irradiate the electromagnetic waves to the --
13 irradiate the electromagnetic waves to the components to make
14 sure that there is no malfunction, and the actual vehicle
15 test is also conducted under the same concept.
16 Mr. Leviss. I'm sorry. Let me ask a question.
17 BY MR. LEVISS:
18 Q Are you saying that you're testing for
19 electromagnetic interference, and as part of that test, you
20 expose the system to a device that is twice the standard or
21 twice what can be expected from a consumer device?
22 Mr. Ogawa. Are you asking twice as much as the standard
23 or consumer?
24 Q I don't understand what he's talking about, and I'm
25 trying to understand it.

1 Mr. Ogawa. I was explaining about the bottom of this
2 second table.
3 Q So where it says "radio antenna" and "cellular
4 phone proximity." Is that what you're talking about?
5 Mr. Ogawa. Yes. So we expose the component with twice
6 as much output of the transceiver that is commercially
7 available and make sure that there are no misoperation or
8 malfunction.
9 BY MS. TINDALL:
10 Q Do you also expose it to the level one might expect
11 from a commercially available device?
12 Mr. Ogawa. I was explaining that we are doubling the
13 output of what is available in the market, but your question
14 is?
15 Q This test uses double the output that one might
16 expect from a commercially available device. I'm asking:
17 Do you also have a test that includes the amount of
18 output, just the amount of output that one would expect from
19 a commercially available device?
20 Mr. Ogawa. No, because double the output is more
21 stringent, so if we confirm the operation with that, then
22 there shouldn't be any problem with a normal output.
23 Q Okay.
24 Mr. Ogawa. So, in this type of evaluation, we have
25 never experienced one instance of unintended acceleration, so

1 we firmly believe that there is no unintended acceleration
2 attributable to EMI.
3 Then I will move on to explaining the software testing.
4 Okay. I am looking at the first line under item No. 1.
5 The size of the software is going to be about 200,000 lines
6 if you combine the engine and also ETCS. It is not realistic
7 to evaluate this code all at once. Therefore, we divide this
8 into 1,600 modules. By breaking them up into smaller
9 modules, we are able to conduct detailed testing. So, after
10 confirming the performance of each individual small module,
11 then we can combine them and make into the entire program and
12 ensure the performance of the entire program.
13 When everything is combined, the large program only
14 requires the connection between the modules, so it is an
15 efficient way of doing so because it only requires the
16 evaluation of the connection points of those modules, so it
17 is efficient.
18 My analogy is that this is sort of like combining Lego
19 pieces to create a big program. Thank you for understanding.
20 Q We all understand Legos.
21 Mr. Ogawa. Even though we divide them into modules, it
22 takes quite a lot of time to evaluate the software. The
23 table shows some examples.
24 In the case of 2007 model year Camry, it takes about
25 500,000 hours to create those modules, and combining those

1 modules requires about 22,000 hours. At the end, as a
2 vehicle, it goes through a driving test for over 400,000
3 miles. So a cumulative driving distance for this testing of
4 all the vehicles that have ETCS installed in them are 35
5 million-plus miles.
6 In this testing, we have never confirmed an instance of
7 unintended acceleration. Therefore, we believe that there is
8 no relationship between the electronics and the unintended
9 acceleration.
10 BY MR. LEVISS:
11 Q Are you physically driving these cars 400,000-plus
12 miles?
13 Mr. Ogawa. Yes.
14 That's all for my part.
15 Mr. Hester. Thank you for your patience.
16 BY MS. TINDALL:
17 Q I have one question about the presentation and the
18 testing records. They are all for the 2007 model year Camry,
19 is that correct, the summary of the tests and the testing
20 documents produced?
21 Mr. Ogawa. Yes. Are you talking about this document?
22 Q These, yes.
23 Mr. Ogawa. Yes, that's right.
24 Q Okay. Would the testing conducted on other models
25 or other years differ from what you have described?

1 Mr. Ogawa. The basic method, testing method, is the
2 same, so we basically do the same testing; but, of course, if
3 the model changes or engine changes, then they are different
4 testing, but based on a similar method.
5 Q So the component parts that are similar are tested
6 in the same way. To the extent a vehicle has different
7 component parts, those different parts might be tested
8 differently?
9 Mr. Ogawa. If a component was modified, then we conduct
10 the necessary testing. If the program is different, we
11 evaluate the program and do the debugging, but if the ECU is
12 identical, then even though it is installed in a different
13 model vehicle, if the hardware is completely identical, then
14 we do not perform the testing. I'm saying the reliability
15 testing is not conducted, but we do conduct EMI testing,
16 because if the vehicle body is different, then the effect of
17 EMI might differ. That's why we conduct those.
18 Q Okay. How did you choose the 2007 Camry as the
19 vehicle for which testing documents would be produced?
20 Mr. Ogawa. We chose this vehicle because we thought you
21 may be interested in this vehicle.
22 Q Okay.
23 Mr. Hester. It has a number of complaints.
24 Ms. Tindall. Okay. I think we should take a break.
25 [Recess.]

1 RPTS REIDY

2 DCMN HOFSTAD

3 [3:00 p.m.]

4 Ms. Tindall. I am going to direct my questions largely

5 to Mr. Ogawa, but, to the extent it makes more sense for Mr.

6 Kishi to answer, then please let me know.

7 Mr. Ogawa. Before you start questioning, I would like

8 to add one thing.

9 When I explained about reliability testing not being

10 conducted if the hardware of ECU is identical, I meant to say

11 that it is tested on the vehicle level when it is installed

12 on the actual vehicle. The ECU hardware, even if it is the

13 same, the reliability test is being conducted.

14 BY MS. TINDALL:

15 Q Okay. So you have walked us through much of the

16 testing conducted by Toyota. I am going to ask you some

17 questions about that testing and then probe a little bit

18 about any additional testing that might occur.

19 The testing we have heard about so far has been related

20 to the design phase. And I just want to confirm my

21 understanding that further testing on the vehicle does not

22 occur after the design is deemed complete.

23 Mr. Ogawa. Once the design is completed and mass

24 production is initiated, then that means that the design is

25 completed, so we do not conduct anything additional in

1 particular.

2 Q The testing you discussed, is it done on prototype

3 vehicles and parts, or do you ever use cars that have been on

4 the road?

5 Mr. Ogawa. Basically, we conduct our testing on

6 prototype vehicles, but as the prototype becomes more and

7 more complete, the degree of completion increases, it

8 approaches what it is going to be on the market, or

9 mass-produced vehicles. And ultimately, we use a prototype

10 vehicle. Even though it is called "prototype" vehicle, this

11 is something that is produced in the mass-production plant,

12 actual production line.

13 Q How do you simulate the wear that would occur on a

14 vehicle and its component parts once it has been on the road

15 for several years in your testing?

16 Mr. Ogawa. With respect to actual vehicle, or

17 particularly electronic components, we would place the

18 prototype vehicle in such an environment where we measure the

19 temperature within the vehicle, in other words, the ambient

20 temperature surrounding the electronic components. Also, we

21 would let the vehicle run our test course, and then we

22 measure the temperature and vibration. And, by doing so, we

23 determine the testing conditions.

24 Q So, in determining those testing conditions, what

25 real-world wear and tear and exposure are you trying to

1 simulate?

2 Mr. Ogawa. We believe that we have a substantial amount

3 of data that are collected from the usage in the marketplace

4 or in the real world. And so, as far as we are following our

5 testing method, we believe that reliability of a vehicle can

6 be confirmed.

7 But at the same time, we collect components from the

8 real world periodically to make sure or confirm they are

9 performing as we expect. And we are feeding back that data

10 into our testing method.

11 Q How do you decide which component parts from the

12 market to collect?

13 Mr. Ogawa. In the case of component, it will be

14 installed in a vehicle that is going to be driven in the

15 region or area where temperatures are higher than normal --

16 in other words, in a new environment. Or if we make a

17 drastic design change, then we collect those parts or

18 components from the marketplace.

19 Q Do you collect component parts on vehicles that

20 have been subject to complaints?

21 Mr. Ogawa. We do. But we do not only that, but

22 voluntarily collect good components -- we call them good

23 components collection -- as well.

24 Q Okay. And what sort of testing occurs with these

25 component parts that you have collected from the market?

1 Mr. Ogawa. In the case of an ECU, for example, we would
2 check to see if the electrical properties are proper or
3 correct, as well as we would check for any deterioration in
4 soldering parts.
5 Q Do you rerun any of the tests we discussed in going
6 through the flowchart on the first page of Exhibit 2?
7 Mr. Ogawa. We do not perform any of these tests on the
8 collected parts from the market. The purpose of that
9 collection of the parts is investigation, so we do not apply
10 durability testing.
11 Q And do you ever pull vehicles from the field, or is
12 it just component parts?
13 Mr. Ogawa. Since I am responsible for the ETCS, I can
14 definitively say that we collect ECUs, but I do not know
15 whether whole vehicles are collected. I do know for a fact
16 that we do such a thing as buy-back, or buying back.
17 Q What do you do with vehicles that are bought back?
18 Mr. Ogawa. If it involves a component that falls under
19 my responsibility, then I would first confirm or check the
20 performance of that component. But I am not the one who
21 decides what sort of investigation is going to be conducted
22 on a vehicle that is brought back, so I do not know in detail
23 what sort of policies or guidelines that are followed.
24 Q Okay. But for the component parts that would be
25 within your realm of responsibility, you say that you confirm

1 or check their performance. How do you do that?

2 Mr. Ogawa. In the case of an ECU, for example, I would

3 give an input signal and then check the output signal. And,

4 by doing so, I am able to confirm the functionality or the

5 function of the component.

6 And as I stated earlier, in addition to that, I would

7 visually check the components that could be possibly

8 deteriorating, such as a solder part. And if I find any

9 anomaly in the input or output signals, then I would further

10 analyze the component in order to identify what is wrong.

11 Q How do you then incorporate that analysis into the

12 design process or into the testing regime you described

13 earlier?

14 Mr. Ogawa. As a result of my analysis, there may be

15 occasions where the problem was caused by a manufacturing

16 problem. In that case, there is no problem with the design,

17 so I do nothing.

18 Q Do you notify the manufacturer?

19 Mr. Ogawa. Yes. If there was a design fault, then

20 there must be some deficiencies in the design standards or

21 design evaluation standards, so I review them and collect

22 them.

23 Q The testing that we discussed earlier that takes

24 place during the design phase, the function testing,

25 reliability testing, is there a standard sample size for

1 these tests?

2 Mr. Ogawa. In the case of software, for example, the

3 sample number is just one, because there are no variations

4 between software. But in the case of hardware, it is

5 conceivable that there are some variations, so we use

6 multiple numbers as samples. But the number would depend on

7 the type of testing.

8 Q Can you give some examples of sample sizes for

9 particular tests?

10 Mr. Ogawa. If you would look at tab number 2 on the

11 first page of the table, it shows the reliability test

12 results. Here you see "soldering joint life test." I do not

13 know the exact number, but in the case of ECU, we use about

14 10 units. Underneath that, you see an item called "low

15 temperature exposure test" and "high temperature exposure

16 test." We roughly evaluate four samples for these type of

17 tests.

18 Q Four each?

19 Mr. Ogawa. Four samples for each testing. So I cannot

20 give you exactly how many samples are used in each instance,

21 but that is about the rough idea.

22 Q For either a vehicle or for its major subsystems,

23 like the electronic throttle control system, is there a

24 formal development of safety specifications? A term that I

25 have heard used is "safety system requirement specification."

1 Mr. Ogawa. I am unable to answer that because I really
2 don't know that exactly.
3 Q Okay. Let's move on to talk about the document
4 that was marked as Exhibit 1, the Diagnostic and Fault Tree
5 Analysis. When, in the development of a design for a vehicle
6 or a system, would a document like this be created?
7 Mr. Kishi. May I answer in his place?
8 Q Sure.
9 Mr. Kishi. This type of document would be prepared in
10 the very initial stage or phase where the overall structure
11 is decided. That is true for the control system or
12 component.
13 And I would like to add one more thing. As the
14 development moves forward and there are changes made into
15 that, then all of the changes are subject to similar
16 analysis. The ETCS that we develop is base technology or
17 fundamental technology that is commonly used in all vehicles.
18 And when we design a vehicle or engine assembly, we would
19 combine various of those fundamental or basic technologies.
20 Q So would this document describe a fault tree
21 analysis of the electronic throttle control system, generally
22 speaking, or for any particular vehicle or at some stage in
23 its development? Can you help me place what component
24 exactly this fault tree is applying to?
25 Mr. Kishi. Everything, the whole system that is ~~done~~ written on

1 there.

2 Q But it wouldn't be vehicle specific or model year

3 specific?

4 Mr. Kishi. Basically, true, yes.

5 So basically all of the Toyota ETCS are created or

6 developed in accordance with this FTA.

7 Q Would there be other fault tree analyses that also

8 apply to the ETCS?

9 Mr. Kishi. Basically, the FMEA lists all of the failure

10 modes. And, as far as this FTA is concerned, this has to do

11 with unintended acceleration. For example, when an

12 unintended acceleration occurs, the throttle opens, or

13 something like that.

14 Q So would it be correct to the say that all the

15 possible causes of a throttle opening by itself would be

16 listed under failure modes and after throttle opens by itself

17 on this document?

18 Mr. Kishi. Yes.

19 Q Are you familiar with the term "Ishikawa diagram"?

20 Mr. Kishi. No, we don't know.

21 Q Okay. Are there other sorts of fault analysis that

22 takes place in the design phase for the electronic throttle

23 control system, or is this the comprehensive fault analysis

24 document?

25 Mr. Kishi. As far as unintended acceleration is

1 concerned, everything is contained here. And whether or not
2 there are others, this was produced to you already. And so I
3 guess I have to go back and look at the documents that were
4 created back then once more in order to answer.
5 Q So there may be additional fault analyses, but it
6 is your understanding that, for the fault or the symptom of
7 unintended acceleration, this encapsulates all of the fault
8 analysis, this document, Exhibit 1?
9 Mr. Kishi. Yes.
10 Q How do you determine that you have identified all
11 the potential causes of a particular symptom like unintended
12 acceleration?
13 Mr. Kishi. The FTA represents or depicts that process
14 in the form of a tree individually. They are represented in
15 sequence. And several people are involved in considering
16 this, and this is mechanism for that purpose.
17 Q Is that analysis recorded separate from this
18 document? Would there be another piece of paper that
19 contains the analysis you just described?
20 Mr. Kishi. Are you referring to maybe memos that
21 various people have jotted down after brainstorming?
22 Q I don't know, I could be. I am wondering whether
23 the brainstorming you are describing is recorded in any
24 formal way.
25 Mr. Kishi. I don't have the answer right now.

1 Mr. Ogawa. I did not personally get involved in the FTA
2 activities. This is Mr. Kishi's scope.
3 But I believe that the brainstorming that takes place,
4 whatever comes out of the brainstorming sessions are all
5 summarized in this. So, until this is formally prepared,
6 there must be some draft or memos leading to this final
7 paper, but I think this summarizes everything.
8 Q Going back to the Ishikawa diagram, apparently
9 Ishikawa diagrams were developed by Kawasaki. And they are
10 also called cause-and-effect diagrams or fish-bone diagrams.
11 Are those documents that Toyota uses to do a root-cause
12 analysis of a problem?
13 Mr. Kishi. Yes. The fish-bone diagram is often
14 utilized as a problem-solving method in day-to-day work.
15 Q So would fish-bone diagrams exist for the
16 electronic throttle control system or for individual failure
17 modes within such a system?
18 Mr. Ogawa. May I have the question one more time?
19 [Question restated by the interpreter.]
20 Mr. Kishi. I do not know whether or not those things
21 exist today, but, generally speaking, when an engineer -- or
22 it may not be necessarily an engineer, but when people have
23 to analyze something, it is not unusual for them to use such
24 a tool to facilitate their thinking process.
25 Q To the extent that any of these fish-bone diagrams

1 exist for either the electronic throttle control system
2 generally or for the particular fault or faults associated
3 with sudden, unintended acceleration, we would ask that
4 Toyota either produce those documents or identify where in
5 your production they already exist.
6 So, how do you incorporate the failure modes listed here
7 on Exhibit 1 for "throttle opens by itself," how do you
8 incorporate those into the testing regime in the design of a
9 system?
10 Mr. Kishi. I am not following your question.
11 Q Do any of these tests that we discussed earlier
12 specifically take account of the failure analysis represented
13 here?
14 Mr. Kishi. Are you talking about these tests?
15 Q Any of the testing we have discussed.
16 Mr. Ogawa. Any of the tests? What are you asking us
17 again to show?
18 Q I am asking whether the failure analysis leads
19 directly to any particular testing. How is the analysis
20 conducted here connected to the testing you do to make sure
21 that a design is complete?
22 Mr. Kishi. I will explain the first page.
23 For the failure modes, we first developed logic~~s~~ to
24 detect these failure modes, and then incorporate the logic
25 into the software. And in order to check to see if the

1 software is working as we expect it to work, that is done by
2 Mr. Ogawa's group, which detailed testing is conducted.
3 Mr. Ogawa. Should I give you an example?
4 Ms. Tindall. Sure. That would be great.
5 Mr. Ogawa. Please look at tab 4. The first engineering
6 report that you see, this reports the results of the
7 confirmation of the detection of abnormalities. And under
8 the heading "Test Results," you see all of the test results.
9 If you look at the last line, or the second from the
10 bottom, you see five SAE codes, starting with P2122, P2123.
11 The P2122 code report represents the detection of an anomaly
12 where the accelerator sensor number one -- indicated in the
13 drawing -- the signal was shorted, or grounded. And so here,
14 what is indicated is, on an actual vehicle, we cause this
15 failure mode to occur, and the actual detection was made and
16 a fail-safe was implemented. And thus it is judged as
17 passed.
18 So these five codes represent the confirmation of the
19 detection of accelerator pedal censor-related abnormalities.
20 So we do individual checks like this. We only included the
21 cover sheet of this report, and, as you can see, the entire
22 report is 43 pages. So behind this cover sheet you have 42
23 pages of data.
24 So by confirming these functions, following this type of
25 checking, we can confirm that all of the failures that had to

1 be detected by this FTA are detected.

2 Q So there would be a test and a corresponding

3 engineering report that would correspond to each of the

4 faults on this document?

5 The Interpreter. Could you repeat that?

6 Q So would there be an engineering report and a test

7 that would take into account each of the faults listed under

8 the failure modes on this document, Exhibit 1, the fault tree

9 analysis?

10 Mr. Ogawa. Yes, that's correct.

11 BY MR. LEVISS:

12 Q So this engineering report is designed to detect

13 whether each of these abnormality codes are properly picked

14 up by the system; is that correct? And I am referring to the

15 first report in tab 4 of your binder.

16 Mr. Ogawa. That is correct.

17 Q So each time that it says in the judgment column

18 that it has passed, that means that you have gotten the

19 abnormality code that you expected under the testing

20 conditions; is that correct?

21 The Interpreter. Could you repeat that one more time?

22 Q I am asking, each time it says "passed" for your

23 judgment column, does that mean that you have gotten the

24 abnormality code that you would expect from the given testing

25 conditions?

1 Mr. Ogawa. Yes, that is correct. So this doesn't mean
2 that even though abnormality was detected, the vehicle
3 passed. It doesn't mean that. It is confusing the way it is
4 expressed in the word "passed."
5 Q So what does the word "passed" mean?
6 Mr. Ogawa. This means that the abnormality detection
7 performance meets the required standard, it meets the
8 specification. So if things weren't detected, then this
9 isn't going to be expressed as passed.
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1 RPTS SCOTT

2 DCMN SECKMAN

3 [4:00 p.m.]

4 BY MR. LEVISS:

5 Q So is this a test of the vehicles system's ability

6 to detect problems?

7 Mr. Ogawa. That's correct.

8 Q And this page behind this in Japanese, is that this

9 same information as the page we are looking at in English?

10 Mr. Ogawa. Yes. The original is in Japanese, and it's

11 translated into English.

12 Q Thank you.

13 Ms. Tindall. For ease of reference in the future, we

14 are going to go ahead and mark the entire binder as Exhibit

15 3. These are the materials for the March 18, 2010, interview

16 of Mr. Takashi Ogawa and Mr. Hirohisa Kishi, and it contains

17 the engineering report we were just discussing.

18 [Ogawa/Kishi Exhibit No. 3

19 was marked for identification.]

20 BY MS. TINDALL:

21 Q How do you decide which diagnostic fault codes will

22 be stored?

23 Mr. Ogawa. Generally speaking, if I use a sensor as an

24 example, a certain sensor can output only a certain range of

25 voltage; for example, 1 volt to 4 volts. So, if the sensor

1 outputs a voltage smaller than 1 volt or a voltage greater
2 than 4 volts, then you can determine that sensor to be wrong.
3 So our basic way of determining the abnormal range would
4 be to start from that normal range, and then you add a
5 certain amount of margin to the normal range to determine the
6 normal range.
7 Did that answer your question?
8 Q I think I'm asking a question at a higher level.
9 When you have decided that various diagnostic trouble
10 codes will be stored in the computer, is there an analysis or
11 brainstorming or, you know, fault tree analysis or some other
12 sort of process by which you decide all of the codes which
13 should be incorporated?
14 Mr. Ogawa. Basically, diagnostic trouble codes are set
15 as a tool for a dealer to exchange parts, or components. So
16 they are set so that abnormal components are identified, but
17 the more detailed the failure modes, the more helpful they
18 will be for the repair work. So, even if the same sensor
19 failed, if the detection method is different, then two
20 different codes are provided in order the help repair work go
21 more efficiently. For example, there may be a line breakage
22 in the sensor that caused the failure, or it could be
23 shorted. So, for each of the instances, we provide different
24 codes.
25 Is that answering your question?

1 Q Sort of. I'm still trying to determine, I guess,
2 would each of the failure modes listed here have a diagnostic
3 trouble code, and are there other sources of diagnostic
4 trouble codes? How do you decide at the outset what the
5 computer will look for?
6 Mr. Ogawa. All sensors that are connected to computer
7 are subject to diagnostic, and as a result of a failure of a
8 sensor, there may be cases where unintended acceleration
9 occurs or an engine stalls or emissions deteriorate or
10 something like that could occur; but at any rate, all of the
11 sensors are designed so that, if they were to fail, the
12 failure is detected, and so that fail-safe is applied.
13 So, in this case in particular, what we focused on is
14 all of the failure modes that have the risk of causing
15 unintended acceleration, so we have taken the steps to
16 definitively detect such failures and make sure that the
17 fail-safes are applied to eliminate such risks.
18 BY MR. LEVISS:
19 Q But does each one of these failure modes on Exhibit
20 1 produce a unique DTC unit code?
21 Mr. Ogawa. Yes.
22 BY MS. TINDALL:
23 Q What is the corresponding fail-safe for each of
24 these failure modes?
25 Mr. Kishi. I gave some explanation earlier about that,

1 and I think it would be better if I explain as a whole
2 instead of individually going through the list.
3 So is that okay?
4 Ms. Tindall. That's fine, but I think we should
5 probably mark this drawing. We are up to -- what? --
6 Exhibit 4?
7 [Ogawa/Kishi Exhibit No. 4
8 was marked for identification.]
9 Mr. Kishi. I'm not going to write any more on that.
10 Ms. Tindall. Okay. Thank you.
11 Mr. Kishi. The simplest one would be the case where the
12 main CPU fails and the sub CPU fails, the motor fails and the
13 circuitry fails. In all of these instances, the electrical
14 current to the motor is shut off.
15 How we identify those instances, for example, the
16 computers are monitoring each other's operation, and in the
17 case of the motor, the computer is monitoring the current
18 that runs through the motor. On that occasion, the throttle
19 valve looks like this, in this state, the idling state.
20 Ms. Tindall. And that is with the throttle closed?
21 Mr. Kishi. Closed, yes. The spring closes it.
22 BY MR. LEVISS:
23 Q So let me see if I understand you correctly.
24 In each of the problems that you just mentioned, either
25 the main CPU shutting down or the sub CPU or one of the

1 others, in any one of those scenarios, the fail-safe mode is
2 for the throttle valve to close, as you demonstrate?
3 Mr. Kishi. Yes. The electrical current to the motor is
4 cut off.
5 BY MS. TINDALL:
6 Q And that would cause the valve to close?
7 Mr. Kishi. Yes.
8 Q You said the main CPU is monitoring the sub CPU,
9 and the sub CPU is monitoring the main CPU.
10 The fail-safe mode would be initiated when the sub CPU
11 notices that the main CPU has gone out or has a fault for
12 some reason. Is that how the fail-safe is triggered?
13 Mr. Ogawa. This has to do with the electrical system,
14 so I will explain.
15 So, first of all, the main computer monitors the sub
16 computer, and the sub computer monitors the main computer.
17 Either can go ahead and cut off the electrical current. So
18 whichever cuts off the electrical current supersedes the
19 other, or has the priority.
20 The Interpreter. Actually, I'm sorry. The second
21 interpreter said that he said, "the first priority is to go
22 and cut the electrical current to the motor."
23 Mr. Ogawa. So the main computer and the sub computer
24 have two functions. One is to confirm the appropriateness of
25 the signal, and also, the second function is to communicate

1 data between the two computers, and they would cut off the
2 electrical current to the motor when even one of such
3 functions goes wrong.
4 For example, if a failure occurs with the main CPU, the
5 sub CPU will detect that. Then the sub CPU would cut off the
6 current, electrical current, to the motor. So, at that time,
7 no matter how hard the main CPU tries to send the electrical
8 current to the motor, the shut-off function takes over so
9 that it will not be able to allow the electrical current to
10 go to the motor.
11 BY MS. TINDALL:
12 Q What would happen if a common-cause fault occurred
13 that affected both the main CPU and the sub CPU?
14 Mr. Ogawa. We are talking about two independent
15 microcomputers, so it is unlikely or highly unlikely that
16 both of them fail at one time.
17 Q Is it not possible for, say, electromagnetic
18 interference to affect the main CPU and sub CPU in the same
19 way?
20 Mr. Ogawa. As I explained earlier, we have conducted a
21 number of EMI testing under stringent conditions, but we have
22 never experienced an instance like that.
23 Q But, while unlikely, it is true that the fail-safe
24 depends on either an operational main CPU or an operational
25 sub CPU. So, if both were inoperative, the fail-safe

1 wouldn't trigger?

2 Mr. Ogawa. To the extent of our experience and

3 conceivable EMI or other causes, it is extremely, highly

4 unlikely for two microcomputers to fail simultaneously. We

5 are testing on the order of 100 millisec-level cycles, and it

6 is highly unlikely for those two microcomputers to fail at

7 the same time.

8 Q I think I heard, initially after my question, that

9 Mr. Ogawa said, "Hai," and I didn't get the "yes" in the

10 translation, so let me repeat.

11 It's true that, if the main CPU and sub CPU failed at

12 the same time, there would be no way to trigger the

13 fail-safe?

14 Mr. Ogawa. Except that we do not believe that it is

15 possible for the two microcomputers to fail at the same time

16 in the real world.

17 Q But, if they did, the fail-safe wouldn't trigger?

18 Mr. Ogawa. I may be repeating myself, but it is

19 extremely unlikely for the two microcomputers to fail at the

20 same time after failing in the reciprocal monitoring

21 functions of those two computers.

22 I forgot one more thing. There is another

23 microcomputer, or IC -- I'm sorry. There's an IC power

24 source -- or a power supply IC that monitors this main CPU.

25 So, even in the case where both microcomputers have

1 abnormalities, that power supply IC goes out there to
2 terminate or stop the microcomputers.
3 Mr. Kishi. May I supplement something?
4 Ms. Tindall. Sure.
5 Mr. Kishi. I believe there is a safety standard for
6 ETCS known as FMVSS-124.
7 In the standard, there are provisions that say fail-safe
8 must be certainly applied for any single-point fault.
9 Therefore, according to the regulations, each automaker is
10 making a similar system in accordance with that.
11 BY MS. TINDALL:
12 Q So the fail-safes are designed for single-point,
13 single-event faults. Is that what you're saying?
14 Mr. Kishi. Yes.
15 Q The IC that Mr. Ogawa was talking about, does "IC"
16 mean "integrated circuit"?
17 Mr. Ogawa. Yes.
18 Q Where is that on the schematic in exhibit 4?
19 Mr. Ogawa. Should I indicate?
20 Q Sure.
21 The Interpreter. Can he add on to that?
22 Ms. Tindall. Sure.
23 Mr. Ogawa. Yes, it takes a form like this because the
24 power supply IC monitors the main CPU.
25 BY MS. TINDALL:

1 Q The power supply monitor is the main CPU? Is that
2 what you said? The power supply IC monitors the main CPU.
3 Okay. So, if the main CPU goes out, what does the IC do?
4 Mr. Ogawa. It would try to reset the main CPU. The
5 hardware is designed so that, when the main CPU is reset, the
6 electrical current through the motor is off, turned off. So,
7 even if an anomaly occurs with the software, the hardware
8 remains normal, and that microcomputer's hardware shuts off,
9 regardless of the program, when it is reset.
10 Mr. Kishi. Should I -- I'm sorry. I was interrupted.
11 Should I go ahead and explain all the other --
12 everything about the fail-safe first? I started out doing
13 that, but it sort of deviated from that.
14 Ms. Tindall. Sure.
15 Mr. Kishi. There aren't that many more.
16 I spoke about the circuitry earlier. I'm talking now
17 about the throttle sensor. The two throttle sensors are
18 checked by both microcomputers, but if even one of the two
19 shows an abnormal value, then the motor is shut off
20 similarly.
21 The next item is the accelerator position sensor. There
22 are two sensors. It's a little complicated in this case. If
23 one of the sensors fails, then the signal of the other sensor
24 will be used, except that a restriction is applied to the
25 degree of openness of the throttle valve. So, in that

1 instance, no matter how hard you depress the accelerator
2 pedal, the valve only opens about one-fourth. This mode
3 allows our customer to drive the vehicle to the nearest
4 dealer, slowly.
5 BY MR. LEVISS:
6 Q Limp home mode?
7 Mr. Kishi. We call it "power limit mode."
8 If one of the sensors still works -- that happens, but
9 if both sensors fail or the signals are interrupted, then it
10 becomes -- the engine becomes idling -- or into the idling
11 mode.
12 The last one, I spoke about this earlier, but when the
13 electrical current supplied to the motor is cut off and there
14 was something detected as interrupting the valve, this is
15 detected by the air volume, but in that case, the fuel supply
16 is cut off.
17 BY MS. TINDALL:
18 Q So the accelerator pedal has two independent
19 sensors, and the throttle has two independent sensors; is
20 that right?
21 Mr. Kishi. Correct.
22 Q And are these called "hall effect sensors"?
23 Mr. Kishi. That's correct.
24 Q There are two separate sensors in there, but they
25 are designed and constructed in the same way; is that right?

1 Mr. Ogawa. Yes.

2 Q Do they share the same printed circuit board?

3 Mr. Ogawa. Yes.

4 Q And do the wires that connect the sensors to the

5 ECM share a common wiring bundle?

6 Mr. Ogawa. What is the "common wiring bundle"?

7 Q My understanding is the wiring bundle is the

8 collection of wires that travels together to the ECM.

9 Mr. Ogawa. Yes. Yes, the sensors are connected to

10 ECUs. Are you talking about a common wiring bundle shared by

11 both sensors?

12 Q Yes, by the two accelerator sensors or the two

13 throttle sensors. I don't know about all four.

14 Mr. Ogawa. Accelerator pedal sensors comprise six

15 wires -- three each -- for each sensor, so those six wires

16 are bundled together.

17 Q Have you in your testing looked for or identified

18 any disturbances that could affect both sensors at the same

19 time, either both accelerator sensors or both throttle

20 sensors?

21 Mr. Ogawa. No, and that is exactly why we have two

22 sensors.

23 Q So you haven't tested for or studied for any

24 disturbances that could affect the sensors at the same time?

25 Mr. Ogawa. We wire those two sensors using six lines --

1 ground line, power supply line, sensor line -- for each
2 sensor, three each. There may be -- there is another way of
3 wiring using four lines, just a power line and ground line
4 for each sensor, but we do not do that, and so we have
5 never -- and we have never experienced any instance where,
6 because of a simple fault, both of those sensors failed.
7 Q In designing the electronic throttle control system
8 and, in particular, the pedal design, what other companies'
9 existing designs did Toyota benchmark or study?
10 Mr. Ogawa. Yes.
11 Q It wasn't a "yes" or "no" question.
12 In designing -- so maybe you're saying you did look at
13 other companies' designs in designing your own electronic
14 throttle control system. Which companies?
15 Mr. Ogawa. I do not recall precisely, but I think we
16 have looked at companies in the U.S., Japan and Europe.
17 Mr. Kishi. May I interrupt?
18 Are you referring to accelerator pedal assembly?
19 BY MS. TINDALL:
20 Q I asked about the electronic throttle control
21 system generally but the accelerator pedal in particular.
22 Mr. Ogawa. Are you talking about sensor or pedal
23 design?
24 Q I'm talking about this system here that you've
25 drawn on exhibit 4, generally, but also in particular the

1 accelerator pedal sensor design where you have the two
2 independent hall effect sensors speaking to the CPU.
3 Mr. Ogawa. So am I to understand that you don't care
4 about the length of the pedal or the shape of the pedal?
5 Q Right. Exactly. Exactly.
6 Mr. Ogawa. You're talking about the electrical
7 perspective?
8 Q Right. Right.
9 Mr. Ogawa. Although I cannot give you a precise answer
10 right now, we have some results for all of the major
11 automakers in the U.S., Japan and Europe.
12 Q So you looked at a variety of designs in arriving
13 at this electronic throttle control design and the sensor
14 strategy that is used within it?
15 Mr. Ogawa. Again, I was not in charge of this at the
16 time this was designed, so I do not know the precise answer,
17 but I think we used both -- what we benchmarked and also our
18 own determination and conclusion.
19 Q Do you know which parts of the design were unique
20 to Toyota and which came from benchmarked systems that were
21 already in place?
22 Mr. Ogawa. May I have that in Japanese again?
23 [The Interpreter and Mr. Ogawa confer.]
24 Mr. Kishi. Are you asking us if we are using what is
25 used by other manufacturers, the same system or --

1 BY MS. TINDALL:

2 Q I thought Mr. Ogawa was saying that, in arriving at
3 the electronic throttle control system design that we've been
4 discussing, some components of it came from the benchmarking
5 of other companies' designs and that some parts of it were
6 generated independently at Toyota.

7 I was asking if one of you would be able to identify
8 which parts of the design came from other companies and which
9 parts of the design were unique or original to Toyota.

10 Mr. Ogawa. There are no components in this ETCS that we
11 brought from other manufacturers as they are. So, in that
12 sense, this is entirely unique to Toyota, a Toyota original.

13 Mr. Kishi. But we are not doing anything different from
14 what others are doing.

15 Mr. Ogawa. If I speak about accelerator pedal
16 sensors -- we have the No. 1, No. 2 sensors and the outputs
17 from those two sensors -- our outputs are different from the
18 outputs used by other manufacturers, but they are the same in
19 the sense that they are whole different sensors. So it is
20 difficult to explain to you to what extent they are the same
21 and they differ from where.

22 Ms. Tindall. I'm inclined to take a break now. Let's
23 come back at 5:15.

24 [Recess.]

25 [5:00 p.m.]

1 RPTS REIDY

2 DCMN HERZFELD

3 [5:20 p.m.]

4 Mr. Ogawa. May I clarify or add something to what I

5 said earlier?

6 Ms. Tindall. Sure.

7 Mr. Ogawa. When you asked me earlier if both the main

8 and submicrocomputers failed at the same time if the failsafe

9 is triggered, I answered by saying that it is highly

10 unlikely. But even if something like that were to occur,

11 that means that both microcomputers are experiencing

12 abnormalities. Those microcomputers control the engine as

13 well, so they would stop the spark plug firing and also fuel

14 injection. So not only that the electronic throttle control

15 is terminated, but also the engine is stopped.

16 BY MS. TINDALL:

17 Q I want to go back to the schematic in Exhibit 4.

18 Within this electronic throttle control system, does Toyota

19 manufacture any of the component parts itself, or does it

20 have suppliers for each of the parts in the system?

21 Mr. Ogawa. We are purchasing each component from our

22 suppliers.

23 Q What sort of testing does Toyota require of its

24 first-level suppliers?

25 Mr. Ogawa. We are asking our suppliers to evaluate in

1 accordance with the Toyota standard, and I think we have
2 produced to you the Toyota standards.
3 Q Would there be a Toyota standard for each of the
4 component parts, for each potential problem with a part?
5 What exactly gets a Toyota standard assigned to it?
6 Mr. Ogawa. Well, in the case of the ECU, for example,
7 we have Toyota standards for reliability, durability, and
8 there is also a Toyota standard for noise performance. So
9 there are various Toyota standards.
10 Q How far down are these standards applied? And let
11 me use an example. I know that CTS has made some of the
12 pedals used in Toyota vehicles, but I don't know that CTS
13 makes the sensors in the accelerator pedal or the chip in
14 which they are placed. Do the manufacturers of the sensors
15 and the chips also use Toyota standards?
16 Mr. Ogawa. Toyota does not have any clearly written
17 rule or regulations about who has to conform to Toyota's
18 standard below the tier 1 suppliers, what we call the tier 1
19 suppliers, is the only suppliers that we ask to be used in
20 evaluating conformance.
21 And as far as the component parts used in those are
22 concerned, we are totally leaving that to our suppliers. So
23 there may be -- I believe that a supplier's own standards are
24 probably provided to the secondary suppliers, but I do not
25 know the detail.

1 Q How do you ensure that the tier 1 suppliers are
2 properly applying the Toyota standards?
3 Mr. Ogawa. First of all, we discuss the TS and have
4 them understand it and agree to it. And as far as the
5 evaluation results are concerned, we not only require them to
6 submit the simple results, but also output data, as well as
7 the photographs of samples that are cut cross-sectionally so
8 that we can determine or evaluate in detail. In the case of
9 the suppliers who have worked with or transacted with Toyota
10 for a long time, we occasionally evaluate things together.
11 Q Do you ever visit testing sites of your suppliers?
12 Mr. Ogawa. Are you talking about me, personally?
13 Q Toyota generally.
14 Mr. Ogawa. We do that.
15 Q The pedal here in this schematic, that would be
16 made to Toyota's specs; is that correct?
17 Mr. Ogawa. Yes.
18 Q And I know that there have been various pedal
19 suppliers for Toyota. Would the pedals made by each of those
20 suppliers be made to those same specs?
21 Mr. Ogawa. The accelerator pedal sensors are being made
22 based on the same specifications. But I am not responsible
23 for the accelerator pedal censor currently, so I may not be
24 able to answer completely to your question, but I will do my
25 best.

1 Q I take from that answer that at least as far as the
2 accelerator pedal sensors are concerned, they would be the
3 same in a pedal made by any Toyota supplier.
4 Mr. Ogawa. They are made according to the same
5 specifications.
6 Q Would the materials used in the pedal differ from
7 supplier to supplier?
8 Mr. Ogawa. When you say "pedal," am I to understand
9 that to mean the sensor and the circuit board on which the
10 sensor is mounted?
11 Q I was asking about the pedal generally, but to
12 include, yes, the sensor and the circuit board; would the
13 same laminates be used in the circuit board regardless of who
14 the supplier would be?
15 Mr. Ogawa. First of all, I do not have any information
16 about the materials forming this pedal assembly, so I cannot
17 give you the answer. And this is my estimate or speculation,
18 but as far as sensors and circuit boards are concerned, I
19 believe they are commonly used circuit boards and electronic
20 parts.
21 Q And by "commonly used," do you mean they are the
22 same across pedals, or just various sorts commonly available
23 on the market?
24 Mr. Ogawa. Since I have never seen anything
25 particularly about some highly heat-resistant substrate is

1 used or some special IC package resin is used or anything
2 like that, so I estimated that to be commonly used components
3 that are ordinarily used in Toyota electronic components.
4 But that was my estimation. And I don't think it is the case
5 that components such as those used in home appliances, I
6 don't think they are used for parts.
7 Q Would the pedal supplier be responsible for
8 acquiring the sensor and the printed circuit board and
9 ensuring the quality of each?
10 Mr. Ogawa. I am not in charge over that either, so I
11 may not be correct, but I think that request is generally
12 made.
13 Q The request is generally made, as in the pedal
14 supplier is usually responsible for ensuring the quality of
15 those components.
16 Mr. Ogawa. Yes.
17 Q Do you know which companies have supplied pedals to
18 Toyota since it began using an electronic throttle control
19 system?
20 Mr. Ogawa. I do know that currently CPS and DENSO
21 supply those, but I do not have any information about what it
22 was like in the past.
23 Q Do you know who supplies pedal sensors to CTS and
24 DENSO?
25 Mr. Ogawa. I do not have the precise recollection right

1 now.

2 Q Do you know who supplies the printed circuit

3 boards?

4 Mr. Ogawa. I don't know, sorry.

5 Q I am going to show you some specific documents now

6 that we have questions about. We will mark this as Exhibit

7 5. It is Toyota Engineering Standard TSC7100G, Test Methods

8 for TCCS Computers. And the Bates range for this document is

9 TOYEC_00002111 through 2135.

10 [Ogawa/Kishi Exhibit No. 5

11 was marked for identification.]

12 BY MS. TINDALL:

13 Q We have talked a bit about Toyota engineering

14 standards before. For each of these documents we are going

15 to go through, first really what I want to understand is when

16 such a document would be created and what its use is at

17 Toyota, generally speaking. I am not right now going to ask

18 any questions about this particular standard, just about

19 Toyota engineering standards generally, if you can explain

20 that.

21 Mr. Ogawa. The only area I can respond about is the

22 electronic technology area. I do not know much about things

23 that have to do with body or chassis, so I will speak in the

24 context of the electronic technology area.

25 TS is basically the method for evaluating components.

1 So when a newly designed component is developed, this
2 document is created at the same time; otherwise, we won't be
3 able to make the determination as to whether or not the newly
4 designed component can be mass produced. So we have to
5 create this at that time.
6 The Interpreter. Correction:
7 Mr. Ogawa. Otherwise, we won't be able to determine
8 whether the newly designed component is acceptable or not.
9 And once created, this document is revised as needed.
10 For your information, this particular document is very
11 old because this has to do with the Toyota standard for
12 engine control ECU, EFY engine control ECU.
13 BY MS. TINDALL:
14 Q Does that mean it is outdated? Is this still in
15 use?
16 Mr. Ogawa. It has been revised, but it is in use.
17 Q Okay. Is there a standard created for each
18 component in, say, the electronic throttle control system, or
19 would there be a standard for the system as a whole.
20 Mr. Ogawa. Basically it is created for each component.
21 Q Do you also create standards for things other than
22 components; like, say, for a known potential fault or defect,
23 is there a standard for -- or for a particular testing
24 regime?
25 Mr. Kishi. Other than components, you said?

1 Q Yes.

2 Mr. Kishi. May I say something? I am not certain, so I
3 shouldn't say. The electronic throttle on the right-hand
4 side of that assembly, including the valve, that is under my
5 group's responsibility. So when we submit the specifications
6 to our suppliers, we include some of the Toyota standard
7 evaluation items in the component specifications.

8 And so TS is not created to a specific component. In
9 other words, for example, something like EMC-related TS or
10 evaluation-related TS may be applied to multiple components.

11 So, for example, that throttle body is mounted on an
12 engine, and there is a Toyota standard for engine assembly
13 durability test, or a testing method, so that throttle body
14 has to meet that standard. And let's say there is another
15 assembly that is also mounted on the engine, another assembly
16 is also subject to the same Toyota standard, but this Toyota
17 standard is for durability test conducted on the engine
18 assembly as a whole. But the same TS is referred to in the
19 throttle body drawing as well, in the drawing of this other
20 assembly.

21 Q And these engineering standards, are these the
22 standards that we were discussing earlier with regard to
23 testing required of first-tier suppliers? Are they asked to
24 implement these engineering standards?

25 Mr. Kishi. That is correct.

1 Q And we will mark as Exhibit 6 a document entitled
2 Engineering Report No. T0009-0650, Electronic Noise
3 Resistance Evaluation of Electric and Electronic Components
4 on 301N. And the Bates range is TOYEC_00000853 through 858.
5 [Ogawa/Kishi Exhibit No. 6
6 was marked for identification.]
7 BY MS. TINDALL:
8 Q Again, I am just going to be asking general
9 questions about documents of this sort.
10 When is an engineering report created, and how is it
11 used within the Toyota testing regime?
12 Mr. Ogawa. Engineering reports, in the most common
13 case, is created when something was evaluated. It is issued
14 when something is evaluated. And depending on the
15 development method for components, we have set rules that
16 provide for when certain evaluations are done, roughly, and
17 our rule is to prepare a report like this as soon as a
18 testing is conducted.
19 The purpose of this document is to, first, communicate
20 information to the design department. And the second one is
21 to obtain the company's authorization or approval of the test
22 results. And the third being the keeping the record of data
23 or development outcome.
24 Q And so an engineering standard might describe a
25 test that Toyota or a supplier is to conduct, and then once

1 that test is conducted, the engineering report would
2 summarize the results; is that right?
3 Mr. Ogawa. Basically, yes.
4 Q We are now going to mark Exhibit 7. It is a
5 document largely in Japanese. The only thing I can read is
6 DENSO, and it is Bates range TOYEC_00024690 through 24711.
7 [Ogawa/Kishi Exhibit No. 7
8 was marked for identification.]
9 BY MS. TINDALL:
10 Q Other than the fact that this document seems to
11 have been created by DENSO and that Toyota produced several
12 documents that look like it in form, I don't know anything
13 about what this document contains, so I am hoping you can
14 explain that. And let me issue a clarification. I mean this
15 sort of document generally; I am not asking you to digest the
16 25 pages.
17 Mr. Hester. This kind of document from a supplier?
18 Ms. Tindall. Yes.
19 BY MS. TINDALL:
20 Q How does Toyota make use of a document like this?
21 A This is a report that our supplier gives us
22 reporting the results of an evaluation that we request that
23 supplier to perform. Primarily in evaluations we sometimes
24 discover things, but mainly evaluation of something. And
25 based on this type of a report, we would make the

1 determination for the next step. For example, whether the
2 component will be used in the mass production or in the next
3 prototype, we would use this as one of the factors when we
4 make that determination.
5 Q Does it describe testing results?
6 Mr. Ogawa. Yes.
7 Q Does it include any other sort of analysis?
8 Mr. Ogawa. Thumbing through this document, I didn't see
9 any analysis in this particular document.
10 Incidentally, or for your information, this is a report
11 on the debug results on the engine control ECU?
12 Q Does the supplier routinely supply this sort of
13 report to Toyota?
14 Mr. Ogawa. When Toyota makes some development request
15 to a supplier, they usually submit this type of a report.
16 Q Would a similar report be created because of any
17 sort of special concern?
18 Mr. Ogawa. Most frequently this type of report confirms
19 some type of design change is properly incorporated or
20 reflected in the revised component, and those are the most
21 common cases. And so this particular document, for example,
22 was not created because of some particular or special
23 concern, but, of course, there are occasions where we have a
24 certain concern about something and ask specifically to the
25 supplier to investigate or do an analysis and have them

1 report back to us.

2 Q And that analysis might appear in a similar report;

3 is that right?

4 Mr. Ogawa. Yes. Basically it is reported in this form.

5 Q Are there any similarities between the engineering

6 reports and the report from the supplier -- or I guess

7 specifically, is the supplier asked to create engineering

8 reports in implementing the Toyota standards?

9 Mr. Ogawa. As far as the report format is concerned, it

10 is not something Toyota asks the suppliers to follow Toyota

11 format. I think each supplier has its own most reasonable

12 way or format of reporting.

13 Ms. Tindall. Is that something you are asking?

14 The Interpreter. I think that is an answer.

15 BY MS. TINDALL:

16 Q This will be Exhibit 8. There is no title on this

17 document. The Bates ranges, TOYEC_00068648 through 670. And

18 it seems to be some sort of failure analysis, but that is my

19 estimation.

20 [Ogawa/Kishi Exhibit No. 8

21 was marked for identification.]

22 BY MS. TINDALL:

23 Q I just want you to explain what you take this

24 document to be and how Toyota would use it.

25 Mr. Ogawa. Looking at this quickly, I cannot really

1 tell -- or I do not know the content in detail, but the
2 second page has the word "DRBFM," and it is stated here, it
3 is the design review based on failure mode.
4 At Toyota, when a design change is made, we consider
5 what sort of impacts or effects that change might have. And
6 if something requires measures, then we come up with the
7 measures. So this sheet sort of summarizes the actions that
8 we must take in response to a design change. Usually it is
9 written in a more easy-to-read format; I don't understand why
10 this is so hard to see.
11 Q This is the format it was produced in. I wonder if
12 perhaps it was not originally on 8.5x11 paper, but was
13 printed that way. I will not ask you to recreate it.
14 Mr. Ogawa. If I may add, the design review, DR, is an
15 action that is taken to review the design of something to
16 make sure each individual design items are proper or correct.
17 The DRBFM in this document, I believe, does not have to do
18 with the design overall, but it is focusing on the change in
19 some design, and that this is an action taken to review such
20 design change in detail.
21 Q If we could go back to Exhibit Number 5, it is the
22 Toyota engineering standard for TCCS computers. If you could
23 turn to page 5. At the top of the page under the section for
24 Remark, I am reading here from the document. A figure in
25 parenthesis indicates the minimum necessary quantity of

1 samples. And then if you flip back one page to page 4,
2 various test sequences are listed with numbers and
3 parentheses. And I am taking the remark and then the numbers
4 in parentheses to mean that, for example, the power voltage
5 fluctuation tests listed about two-thirds of the way down the
6 page would require a sample size of 1. And just to the right
7 of that, vibration tests require a sample size of 2. Am I
8 reading this document correctly?
9 Mr. Ogawa. Yes.
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1 RPTS SCOTT

2 DCMN HOFSTAD

3 [6:20 p.m.]

4 Ms. Tindall. We are now up to Exhibit 9. We are

5 marking as Exhibit 9 Toyota Engineering Standard, TSC 7630G,

6 Linear Throttle Position Sensor.

7 [Ogawa/Kishi Exhibit No. 9

8 was marked for identification.]

9 BY MS. TINDALL:

10 Q If you could turn to page 3 of the document, in

11 about the middle of the page at number 4, this is general

12 condition number 4, I believe.

13 Looking back on the previous page, it states, "Unless

14 specified otherwise, the sensor shall be tested under the

15 ordinary temperature --" and it provides a temperature

16 rage "-- and humidity," and it provides a humidity range.

17 "When the sensors are tested for characteristics, especially

18 after the environmental tests, leave the sensors in the

19 ordinary temperature and humidity conditions for 2 hours

20 minimum before the test."

21 So, generally speaking, I understand this to mean that

22 sensor testing should not be conducted at high or low

23 temperatures or humidity. When the sensor is subjected to

24 high or low temperatures or humidity, those conducting the

25 tests should leave the sensor in an ordinary temperature and

1 humidity condition for at least 2 hours before they test for
2 any problems with the sensor.
3 Is that a correct interpretation?
4 The Interpreter. I'm sorry. I must have missed
5 something again. Could you --
6 Ms. Tindall. Say it again? Yes. If you actually want
7 to look on the outline, I am on the outline, which might be
8 helpful.
9 Mr. Ogawa. If you're asking if we are to leave the
10 sensor under ordinary temperature and humidity conditions for
11 2 hours in order to make the measurements under the stable
12 conditions, then my answer is yes.
13 BY MS. TINDALL:
14 Q So is this test designed to simulate real-world
15 temperature and humidity conditions that a sensor would be
16 exposed to?
17 Mr. Ogawa. I'm sorry. Were you commenting about the
18 measurements of the characteristics or --
19 Q If you turn back to page 2, we're in a section
20 called "Tests," and we are going through the general
21 conditions for tests. I take those to be tests for the
22 linear throttle position sensor, which is the standard we are
23 reading from.
24 Focusing on the second half of general condition 4, I'm
25 reading this to mean that, after environmental tests of this

1 system, the sensor should be left in an ordinary temperature
2 and humidity condition for 2 hours before the test is
3 evaluated or the results are gathered.
4 I'm asking whether, generally speaking, tests of this
5 component would be meant to simulate the environmental
6 conditions a sensor might experience in the real world.
7 Mr. Ogawa. The component? Or are you asking about the
8 method that we use in leaving the component for 2 hours
9 alone?
10 Q I guess what I'm asking is, why is the component
11 left in ordinary temperatures for 2 hours before testing
12 after environmental test conditions have been applied?
13 Mr. Ogawa. The component immediately after, for
14 example, a high-temperature testing at some 80 degrees or 100
15 degrees -- I may have to find out or confirm exactly at what
16 temperature these testings are conducted -- but the
17 component, immediately after coming out of a hot chamber, is
18 extremely hot, and you cannot obtain a stable measurement
19 that may be obtained at the ordinary temperature.
20 So I think this is saying that, after coming out of such
21 a hot chamber, in order to obtain stable characteristics at
22 the ordinary temperature, it is saying to leave the component
23 alone for 2 hours.
24 At the same time, if you are, for example, doing a
25 low-temperature testing, immediately after component is

1 coming out of a cold chamber, then you will experience or you
2 will see the frosting on the component. So, again, in order
3 to obtain a stable characteristics measurement after such a
4 testing, the component is left alone for 2 hours.
5 Mr. Hester. I want to make sure Mr. Ogawa has had ample
6 time to read, to familiarize himself with what he is
7 commenting on. He is commenting on one page, and he
8 certainly --
9 Ms. Tindall. No, that's fine.
10 Mr. Hester. You're asking generally about the
11 relevance. This is a 1996 document. I don't know whether
12 you're asking a general question. So I understand it might
13 be relevant.
14 Ms. Tindall. I'm asking him to interpret that language.
15 Mr. Ogawa. I think my explanation was correct.
16 BY MR. LEVISS:
17 Q If you are testing the sensor's performance under
18 high or low temperature, how do you get an accurate reading
19 of that performance if you then allow the sensor to sit at
20 room temperature or at ordinary temperature for 2 hours
21 before reading it?
22 Mr. Ogawa. Well, some sensors have temperature-specific
23 characteristics -- high-temperature-specific characteristics
24 or low-temperature-specific characteristics. So, in those
25 instances, there are regulations or specifications that we

1 follow that specify the measurements at certain high
2 temperature, ordinary temperature or low temperature. So we
3 do actually measure at those specified temperatures.
4 But there are sensors that are determined to have no
5 temperature-specific characteristics. In that instance, you
6 may only want to -- or it may suffice to just measure the
7 characteristics at ordinary temperature.
8 So, generally speaking, I think you can understand these
9 measurements to be taken at high, normal, and low
10 temperatures. But, in this particular instance, it just
11 happens to be one of those sensors that didn't require such
12 measurements, and that ordinary temperature was the only
13 requirement.
14 BY MS. TINDALL:
15 Q When you are conducting one of the tests you just
16 described on a sensor that might be sensitive to high
17 temperatures, how do you overcome the obstacle you were
18 describing, in which the sensor comes out of the chamber
19 really hot?
20 You were saying that you have to leave the sensor alone
21 for 2 hours because it would come out of a chamber really hot
22 in a high-temperature test or it would come out really cold
23 in a cold-temperature test. When you actually want to
24 measure what happens under high temperature, how do you
25 overcome that problem?

1 Mr. Ogawa. Before answering that question, first of
2 all, I think maybe something was mistranslated in my previous
3 answer. I don't think that I said that this particular
4 document only required measurements at the ordinary
5 temperature. There may be some other section of the document
6 that might require measurements at some other temperature.
7 So I want to make clear that my statement was corrected.
8 There are, certainly, instances where measurements are
9 taken immediately after the component is subjected to
10 high-temperature testing. But, in other cases, we may leave
11 the component alone for a while and then raise the
12 temperature once more and do the measurement. We do that
13 because the sensors that require high-temperature
14 characteristics are subject to not only high-temperature
15 durability testing but other testing, such as measurements
16 after they are subjected to vibration testing or operational
17 testing.
18 So, basically, we consider the temperature at which the
19 environmental test is conducted as independent from the
20 temperature at which we measure the characteristics of a
21 component.
22 Mr. Kishi. May I make a comment?
23 Q Yes.
24 Mr. Kishi. Looking at page 5 and 4, you can see that
25 there are several test patterns described on these pages. So

1 it appears to me that this is a durability test, that this
2 component was subjected to certain mode or modes, a repeated
3 mode of operation that is described in this document. The
4 purpose of this testing appears to me to be to measure the
5 degree of deterioration of the component after going through
6 this series of repeated durability testing -- or cycles.
7 So, in order to obtain the measurements at the
8 consistent temperature level that it is specified here to
9 leave the component alone for, temporarily for a certain
10 period of time, that's what it appears to me, looking at this
11 document.
12 Q So it wouldn't be testing what happens to the
13 component under high temperature? It would be testing what
14 happens to the component substantially after high temperature
15 has been applied?
16 Mr. Ogawa. That's a possibility, I think. I might have
17 to confirm, looking at this document more thoroughly. But
18 this has to do with a conventional throttle sensor rather
19 than the current throttle sensor. In other words, it's a
20 potential meter-type throttle sensor, it appears to me.
21 So, if I were to assume that this type of throttle
22 sensor did not require temperature characteristics, then it
23 might not have required the high-temperature characteristics
24 measurement. But I may have to look at the document.
25 BY MR. LEVISS:

1 Q What about the test on page 12?

2 Mr. Ogawa. Are you asking me that this shows the test

3 is conducted for high temperature operation or durability

4 test, even after I said that this may not require

5 high-temperature characteristics?

6 Q Yes. Is this a durability or an operational test?

7 Mr. Ogawa. This is a durability test.

8 Q Really? Where does it say durability?

9 Mr. Ogawa. One moment.

10 Mr. Kishi. It may be better if we make a separate

11 report on this if you require a precise explanation on this

12 document.

13 Mr. Leviss. I guess the trouble I'm having in

14 understanding this is I can't tell whether you test this

15 particular sensor for its operation at high and low

16 temperatures or merely for durability.

17 Ms. Tindall. I think there are two tests: one on

18 page 5 and one on page 12. On page 5, there is a

19 high-temperature operation durability test. Then on page 12,

20 there is a high-temperature operation characteristic test.

21 It seems like the one on page 5 might be a durability

22 test but that the one on page 12 would be a test of the

23 sensor's operation at a high temperature.

24 BY MR. LEVISS:

25 Q What I'm hoping you can help me understand is: If

1 there is a test here for the sensor's performance in these
2 high- and low-temperature conditions, why do you return the
3 sensor to ordinary temperature for 2 hours before evaluating
4 its performance?
5 Mr. Ogawa. Generally speaking, this sensor may be
6 something that deteriorates significantly if it is operated
7 at a high temperature. Then, if that's the case, in order to
8 confirm that, we must test that sensor at high temperatures.
9 However, once the component is deteriorated, or
10 degraded, at high temperatures, the way it deteriorates may
11 not be altered, whether it's at high temperature or ordinary
12 temperature. So, in that case, you can just measure the
13 degree of deterioration at the ordinary temperature. That is
14 my estimation.
15 Mr. Kishi. Either way, we are talking based on our
16 speculations, or estimations, here. So we would like to
17 confirm what you would like to know about this document, and
18 then I would like to go back and give you a more accurate
19 answer.
20 But, generally speaking, ordinary sensors used in
21 vehicles, they will go back to the ordinary temperature after
22 you run the engine for a while and then park the car
23 overnight. So it appears to me that, in this testing, the
24 sensor is subjected to various conditions -- stringent,
25 real-world conditions. For example, running the engine at a

1 high temperature for several hours or over a longer period of
2 time, the temperature goes up and down several times or it
3 uses various patterns. But regardless, if the car is parked
4 overnight, the sensor returns to its ordinary temperature.
5 I think the purpose of the test seems to be the
6 measurement of the degree of degradation or deterioration
7 when it returns to the ordinary temperature. So, if that's
8 the purpose of this testing, then there must be another
9 document, if another test was conducted, to confirm its
10 operation at high temperature. So I would like to go back to
11 my office or the company and investigate on that.
12 Mr. Hester. I would like that opportunity, as well.
13 We're doing far too much speculating about a 14-year-old
14 document, and we just need the opportunity to get it right
15 for you, which I think we can do.
16 Mr. Leviss. Sure.
17 I guess the record should reflect that the document was
18 produced to the committee as part of the company's basis for
19 its statements about the safety of its electronic system. If
20 there were a more current version of this document, we would
21 have expected that document to have been produced in lieu of
22 this one. And, you know, we expected that these witnesses
23 could help us better understand them.
24 But if they need more documents back at the company, you
25 know, we want the most complete explanation.

1 Mr. Hester. I understand. I think we've provided you
2 with a 500-and-some-odd-page index of additional testing that
3 has been done. Obviously, you don't want 200,000 pages, so
4 we need to figure out what documents you do need.
5 And this is awfully helpful in getting us there. So let
6 us go back and figure out which of those index documents
7 might be more relevant and more pertinent.
8 BY MS. TINDALL:
9 Q So our internal analysis of the documents Toyota
10 produced suggests that, since the adoption of an electronic
11 throttle control system, Toyota has received over 2,000
12 complaints of sudden, unintended acceleration to just its
13 U.S. call-in complaint line.
14 I'm wondering, as engineers associated with the design
15 and development of that system, whether you are made aware of
16 complaints about such potential defects.
17 Mr. Ogawa. Are you asking if we were aware?
18 Q I'm asking a bit more specifically if you are made
19 aware through any sort of formal process at Toyota, not
20 whether you have read about it in the paper, but whether, as
21 someone responsible for the design of this system, you're
22 made aware of complaints of potential defects and are asked
23 to comment or act upon them in any way.
24 Mr. Kishi. May I start first?
25 Q Sure.

1 Mr. Kishi. I was made aware on several occasions, but
2 the information I was given didn't extend over several
3 thousands. It was a more limited number of pieces of
4 information. But whatever I was made aware of, I was
5 requested to do investigations, so I did do investigations on
6 those.
7 Q When were you made aware? What sort of
8 investigation did you undertake?
9 Mr. Kishi. I do not recall all instances at this
10 moment. But all of the instances before I was assigned to
11 it, whoever was responsible for that directly did the
12 investigation prior to my doing so. And there are several
13 reports prepared in relation to those investigations. There
14 was one done in 2004 and one for Tacoma 2007 --
15 The Interpreter. I'm sorry. I'm sorry. Correction:
16 Mr. Kishi. There were several reports on those
17 investigations: one on 2004 vehicle -- I do not remember
18 which one -- and 2007 Tacoma and also 2004 -- I forget the
19 vehicle, but there were several cases. And I did go see the
20 actual vehicles. I did go and saw the actual vehicles when I
21 was requested to do so.
22 Q And so these were reports of sudden, unintended
23 acceleration in an individual vehicle? Is that what you're
24 talking about?
25 Mr. Kishi. Yes.

1 Q And, as part of your or Toyota's investigation of
2 those vehicles, a report was produced?
3 Mr. Kishi. Yes.
4 Q Do you know what such a report would be titled?
5 Mr. Ogawa. The title, are you asking?
6 Q Yes, or, generally speaking, what this type of
7 report would be called. You know, it doesn't have to be the
8 individual report, but is there --
9 Mr. Kishi. Before giving the name or the title -- well,
10 actually, what I saw are general business reports. And I
11 recall that those reports were sent to my department, as well
12 as the department that designed the vehicle engine related to
13 that vehicle and, also, the quality assurance department.
14 Ms. Poland. Before we go on, may I talk to the
15 interpreter? Because I think that there is a
16 misinterpretation.
17 Ms. Tindall. Okay, yes, please.
18 [The interpreters confer.]
19 The Interpreter. The suggestion was that goes back to
20 two questions before this one. When he was describing about
21 the investigations conducted, the subject was missing, and
22 the interpreter added "I," the first-person subject. But it
23 could be somebody else from Toyota. It should have been
24 "we." "We" did the investigation, or "we" went to see the
25 actual vehicle.

1 BY MS. TINDALL:

2 Q Okay. So let's clarify that. Your recollection is
3 that you have been made aware of reports of sudden,
4 unintended acceleration in particular vehicles. You
5 mentioned maybe one or two vehicles, you don't know the
6 models, from 2004, and then a 2007 Tacoma. And someone from
7 Toyota went to investigate them.

8 Were you among those who went to actually examine the
9 vehicles?

10 Mr. Kishi. No.

11 Q Okay. But you saw the report of the examination;
12 is that right?

13 Mr. Kishi. Yes.

14 Q Do you recall whether the vehicles in question were
15 in Japan, or were the vehicles that were examined in some
16 other country?

17 Mr. Kishi. They were in America.

18 Q The report that was created, you described it as a
19 general business report. Is that actually the title of the
20 report, or is that your description of the report?

21 Mr. Kishi. I'm just generally describing the report,
22 because I need to confirm the actual title. So I am just
23 trying to describe.

24 Q Okay. I have seen documents produced by Toyota
25 called Field Technical Reports. Does that sound familiar?

1 Mr. Kishi. I'm unaware of what's called Field Technical
2 Report.
3 Q And is what you saw in these instances something
4 different than a Field Technical Report?
5 Mr. Kishi. Correct.
6 I would like to add, the reason why I said it's
7 different is because what's called Field Technical Report is
8 primarily prepared by distributors, dealers. And what I saw
9 were prepared by Japanese engineers who were requested to
10 investigate and who actually did investigate.
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1 RPTS REIDY

2 DCMN HOFSTAD

3 [7:20 p.m.]

4 BY MS. TINDALL:

5 Q What sort of investigation did they conduct?

6 Mr. Kishi. I cannot give you a good explanation in

7 detail unless I read the document.

8 Q Sure. Do you know what department created the

9 reports, where the authors of the report work?

10 Mr. Kishi. I can certainly give you the departments if

11 I see the documents, of course. But what I can say now is

12 that some I know where they are from.

13 Q And for those that you know, what...

14 Mr. Kishi. The department is known as 1SE. I wondered

15 if the name of the department has changed since -- it may be

16 the first Engine Technology Department, but more safely, it

17 would be one of those engine departments, not my department.

18 Let me explain. I cannot give you the accurate

19 department name because, over the years, the names of the

20 departments have changed. And if I give you the wrong name

21 -- well, there may be a possibility that I might give you a

22 wrong name, and I do not want to do that.

23 Q But it was a department within Toyota Motor

24 Corporation in Japan, that is your recollection?

25 Mr. Kishi. Correct.

1 Q I don't believe that we have seen documents that
2 fit this description. To the extent that Toyota has not
3 produced them, we would ask that you do, or to identify them
4 if you believe they have already been produced.
5 How did you use these documents? What did you do after
6 reviewing them?
7 Mr. Kishi. To state it accurately, these documents were
8 included in the documents that was produced or submitted from
9 our department when we received the subpoena for documents
10 production this February.
11 Mr. Hester. Would you reread that?
12 The Interpreter. You want me to repeat the translation?
13 Mr. Hester. Yes.
14 The Interpreter. To state this accurately, these
15 documents are submitted or produced from our department --
16 let me restate.
17 Accurately speaking, these were included in the
18 documents that were submitted by our department in response
19 to the document production request made this February.
20 BY MS. TINDALL:
21 Q These documents are in Japanese or in English?
22 Mr. Kishi. In Japanese.
23 Q And what use did you make of these documents after
24 you reviewed them?
25 Mr. Kishi. What do you mean by that?

1 Q After you read them, did you take any action or
2 talk to anyone about them or incorporate them into your work
3 in any way?
4 Mr. Kishi. I do recall the content of the report that
5 relates to the Tacoma report. This has to do with what I
6 gave you in my presentation -- the explanation I gave you in
7 my presentation earlier today regarding the catalytic
8 converter's deterioration preventing logic, causing some
9 misunderstanding or something like that.
10 That report suspected the unintended acceleration in the
11 vehicle, so the investigation was requested, and that was
12 investigated. As a result of the investigation, the author
13 concluded that this was not due to intended acceleration, but
14 it had to do with the engine revolution behavior feeling that
15 is related to the logic to prevent catalytic converter's
16 deterioration.
17 So, reading that conclusion, even though I was concerned
18 before reading the report, after reading the conclusion I was
19 satisfied. And I didn't do anything in particular, I didn't
20 take any action in particular.
21 Q Were there any design changes made as a result of
22 the determination about the logic at issue in that vehicle?
23 Mr. Kishi. I do not remember precisely, but I believe
24 there was a design change made with respect to the catalytic
25 converter.

1 Q Do you ever review field technical reports?
2 Mr. Ogawa. Generally speaking, yes.
3 Q And how do you use them in your job?
4 Mr. Ogawa. Normally, the actual claims are reported in
5 the form of number of instances. So we use those reports to
6 know or investigate actually what sort of things are
7 occurring. But it is rare that we would take some type of
8 action in response to just one report. And, in addition, so
9 far, we do not have any mechanism in place ~~to allow us~~ to
10 read those reports periodically.
11 Q Is there any system in place, any formal process at
12 Toyota by which the engineers responsible for the design of a
13 vehicle would reconsider that design as a result of common
14 complaints from the field of a particular defect?
15 Mr. Ogawa. Yes.
16 Mr. Kishi. Yes, there is.
17 Q Can you describe that process?
18 Mr. Kishi. We have what we call a GR registration, a
19 global registration, and that requires us to register items
20 or issues to be followed up in accordance with the number of
21 complaints or instances that are received in our Customer
22 Quality Assurance Department. And we categorize those issues
23 in three levels.
24 Q What are the three levels?
25 Mr. Kishi. I do not recall the definitions exactly.

1 Mr. Ogawa. But they are categorized by the period over
2 which the design change must be completed, depending on the
3 claims; for example, something has to be changed immediately
4 or it would inevitably take some time.
5 Q So what I am understanding is that the Quality
6 Assurance Department has some system for assessing customer
7 complaints, and then it reports out to your division actions
8 that need to be taken, and those actions are prioritized at
9 one of three levels. Is that an accurate description?
10 Mr. Ogawa. Yes.
11 Mr. Kishi. And the name of the department in Japanese
12 means Customer Quality Assurance Department.
13 Q And has the Customer Quality Assurance Department
14 issued any report to your department about complaints of
15 sudden, unintended acceleration as a result of this process
16 that we are discussing?
17 Mr. Ogawa. I don't think it did. It did not issue any.
18 Mr. Kishi. The reports I discussed earlier, the issues
19 that I discussed earlier were such that a request was made to
20 go investigate the vehicles, and that is why the
21 investigation took place. I don't know if a report was a
22 trigger.
23 Q So the two 2004 vehicle reports and the 2007 Tacoma
24 report, are you suggesting that it is possible that those
25 investigations were triggered by a request from the Customer

1 Quality Assurance Department out of this process that you
2 were describing?
3 Mr. Kishi. I do not know if it was mobilized by the GR.
4 And I would like to correct one thing. I am not sure if
5 there are two 2004 cases. Also, the instance I described
6 about catalytic converter deterioration, that might have been
7 one of those, the 2004 model. So I would like to return home
8 and confirm the models and the numbers of reports to be
9 precise.
10 Q We are familiar with the analysis of potential
11 causes of sudden, unintended acceleration being conducted
12 currently by the consulting firm Exponent. Has Toyota
13 previously undertaken, either internally or through a third
14 party, any comprehensive examination of this phenomenon and
15 its potential causes?
16 Mr. Kishi. We have asked a third-party company to
17 evaluate certain things. And my understanding is that our
18 intended design -- or the design of the system is as intended
19 by us. That is the confirmation that the third-party company
20 is doing.
21 And as far as whether or not we have asked a third-party
22 company to conduct research or investigation prior to that,
23 as far as I know, we have not requested that.
24 Q And the third party you are talking about is
25 Exponent?

1 Mr. Ogawa. That is right.

2 Q Do you know if Toyota has ever internally conducted
3 an examination of potential causes of sudden, unintended
4 acceleration in response to complaints of sudden, unintended
5 acceleration from Toyota drivers?

6 Mr. Ogawa. We received various
7 unintended-acceleration-related information, so we have done
8 some reviews or investigations on that.

9 Q Can you describe those reviews and investigations?

10 Mr. Ogawa. As far as I know, the EMI testing was
11 redone. And, as a result, we did not find any problem.

12 Q When was that done?

13 Mr. Ogawa. I do not recall exactly when it was, but it
14 was some time this year.

15 BY MS. CHRISTIAN:

16 Q That was your department that did the EMI testing?

17 Mr. Ogawa. No.

18 Q Which department?

19 Mr. Ogawa. Aside from my department, which is the
20 Electronics Development Division 2, there is another
21 department known as Electronics Testing -- I do not recall
22 that in English. So, anyway, in Japanese it is Demshii
23 Jikken Bu. That department conducts all of the
24 electronics-related testing. So that department conducted
25 that testing.

1 BY MS. TINDALL:

2 Q Any other tests or investigations done as a result

3 of complaints of sudden, unintended acceleration?

4 Mr. Ogawa. Not at my department, no.

5 Q Any at the Demshii Jikken Bu department?

6 Mr. Ogawa. I don't think they did any other, because we

7 have close communication, we exchange information with that

8 department, so if Demshii Jikken Bu conducted any other, some

9 information must have reached me.

10 Q So it is your understanding that, as a result of

11 complaints of sudden, unintended acceleration, the only

12 retesting or examination of this issue undertaken at Toyota

13 was the EMI retesting redone this year. That is the only

14 example you are aware of. Is that right?

15 Mr. Ogawa. That's correct, yes.

16 Mr. Hester. And when you are speaking about UA

17 generally, you do have the floor mat, sticky pedal-type

18 testing. I am not sure if that is what you are asking about.

19 Ms. Tindall. No, I am not.

20 Mr. Hester. I was just confirming, in the UA area,

21 there was testing on sticky pedals and floor mats, which is

22 not what Ms. Tindall was asking about.

23 BY MS. TINDALL:

24 Q Are you familiar with the investigation currently

25 being conducted by Exponent?

1 Mr. Ogawa. I have read a report, or reports, yes.
2 Q Have you or has anyone else at Toyota considered
3 whether the investigative plan outlined by Exponent is
4 comprehensive?
5 Mr. Ogawa. Having seen the report, or reports, I
6 believe that that is the case.
7 Q Did you personally or did your department generally
8 have any input into the design of the Exponent investigative
9 plan?
10 Mr. Ogawa. You are asking if I or we gave any input to
11 Exponent?
12 Q Yes.
13 Mr. Ogawa. Yes.
14 Q Can you describe the input that you gave?
15 Mr. Ogawa. This may not be precise, but I believe we
16 have at least handed over the ECU circuit diagram, or
17 diagrams, and vehicle wiring harness drawings,
18 specifications. We might have given them more. We also gave
19 them control specifications and software specifications.
20 Q Have you reviewed any fault tree analysis conducted
21 by Exponent?
22 Mr. Ogawa. Not to my recollection, no.
23 Q Do you know what potential failure mechanisms or
24 modes Exponent is studying?
25 Mr. Ogawa. What do you mean by "potential failure

1 mechanism"?

2 Q My understanding is that Exponent is studying

3 whether there could be problems within the electronic

4 throttle control systems that are causing sudden, unintended

5 acceleration. I am asking whether you know what potential

6 faults or failures within that system Exponent plans to

7 examine to determine whether they could cause that event?

8 Mr. Ogawa. I do not understand -- I do not know that in

9 detail.

10 Q It is our understanding that Exponent plans to

11 examine vehicles that are alleged to experience sudden,

12 unintended acceleration. Do you know what Exponent will be

13 looking for in those vehicles? Do you know what that

14 examination will entail?

15 Mr. Ogawa. I do not know. But you are not saying that

16 Exponent is planning to investigate the vehicles that are

17 generally sold to customers? Because that cannot be. That

18 is not possible.

19 Q What I was saying -- and please correct me if I am

20 wrong. I understood that Exponent was going to look at

21 vehicles in which the driver or the owner of that vehicle has

22 complained of a sudden, unintended acceleration event. And I

23 was wondering if you knew what that examination would entail.

24 Mr. Ogawa. I do not know what vehicles they are going

25 to test on, what that investigation would entail.

1 Q As you may or may not be aware, a gentleman named
2 Dr. David Gilbert, who is a professor at the Automotive
3 Technology Center at Southern Illinois University, testified
4 at a hearing held by this committee about a test he had
5 conducted in which he was able to induce unintended
6 acceleration in a Toyota vehicle without having the vehicle
7 register a diagnostic trouble code.
8 Has Toyota conducted any tests similar to this one, or
9 different from this one, in which it has attempted to
10 identify or has identified any faults that would produce
11 unintended acceleration without setting a diagnostic trouble
12 code?
13 Mr. Ogawa. We did check the method used by this
14 Professor Gilbert. We confirmed that it was reproduced using
15 our own vehicles. But we also conducted similar testing in
16 vehicles made by other manufacturers, and we also were able
17 to confirm that automobiles made by other automakers had a
18 similar mode.
19 Q And this is investigation done within your own
20 department?
21 Mr. Ogawa. My department and the Demshii Jikken Bu
22 jointly conducted the investigation. And, also, we made the
23 same request to Exponent.
24 Q In your investigation, the fault that produced
25 sudden, unintended acceleration did not produce a diagnostic

1 trouble code; is that right?

2 Mr. Ogawa. If you follow the Gilbert method, you are

3 correct, DTC is not detected.

4 Q Has your department investigated whether there are

5 any other single or multiple faults that could cause sudden,

6 unintended acceleration and not set a diagnostic trouble

7 code?

8 Mr. Ogawa. We have investigated to see if there are

9 other modes.

10 Q And what did you find?

11 Mr. Ogawa. If you can cause both of the two accelerator

12 sensors to have abnormalities simultaneously, then you can

13 increase the engine RPM, or revolution. Except that the

14 frequency of occurrence in the real world of something like

15 that happening is extremely rare or unlikely. This is also

16 true for the Gilbert method, as well.

17 Q And the further analysis that you did that

18 identified this issue that a fault in the two sensors at the

19 same time would not register a diagnostic trouble code, when

20 did you do that examination?

21 Mr. Ogawa. Sometime this year, I would say February, I

22 think.

23 Ms. Christian. So last month?

24 Mr. Ogawa. Yes, that is right.

25 BY MS. TINDALL:

1 Q What testing did you do to determine the likelihood
2 of this happening in the real world?
3 Mr. Ogawa. It is more of an experience-based view
4 rather than testing. But, to begin with, wireless
5 harness-related abnormalities are extremely rare in terms of
6 occurrence. And on top of that, you are talking about two
7 specific circuits failing at the same time. That is
8 extremely, highly unlikely. At the very least, we have never
9 experienced something like that.
10 Q Have you specifically tested for it before?
11 Mr. Ogawa. Not to my knowledge, no.
12 Q Does Toyota have any plans to conduct any
13 additional testing or evaluation of the electronic throttle
14 control system related to sudden, unintended acceleration,
15 apart from that being done by Exponent?
16 Mr. Ogawa. Internally, correct?
17 Q Internally.
18 Mr. Ogawa. No, we do not currently have any plan.
19 Ms. Tindall. I believe I am at the end of my questions.
20 I believe Karen may have some, but even if it is just a few,
21 I need 2 minutes before we start up. So if we could take a
22 quick break.
23 [Recess.]
24
25

1 RPTS SCOTT

2 DCMN SECKMAN

3 [8:20 p.m.]

4 Mr. Ogawa. Can I add something about the Gilbert

5 method?

6 Ms. Christian. Sure.

7 Mr. Ogawa. I discussed about being able to increase the

8 engine revolution if two accelerator sensors were made to

9 fail at the same time, and I also said that the rate of

10 occurrence is extremely low. This is an expression used by

11 Exponent, and I'm not certain about the English expression;

12 but anyway, they say this is something like reengineering or

13 rewiring, so if you did something -- if you go that far to

14 reengineer something or rewire something, then something like

15 that could occur. That's one of many possibilities that

16 could occur, and it occurs not only in Toyota vehicles but in

17 many other manufacturers' vehicles as well.

18 We are investigating collected components and diagnostic

19 trouble codes and so forth at present, but so far, we have no

20 evidence, clear evidence, that would indicate or relate to

21 sudden, unintended acceleration. So, therefore, we believe

22 that the rate of occurrence of such unintended acceleration

23 under such modes would be extremely, extremely low.

24 BY MR. LEVISS:

25 Q In your clarification, you referred to the work of

1 Exponent. I just want to understand, are your additional
2 remarks here based on your own work and your department's
3 work, or are they on the basis of what you know of Exponent's
4 work?
5 Mr. Ogawa. Oh, this is based on the work that we
6 conduct at our department.
7 Q So your conclusion that the outcome Dr. Gilbert
8 reached is extremely rare is based on your work; is that
9 correct?
10 Mr. Ogawa. Correct.
11 Q Because, before we took a break, you said you had
12 done no testing on the likelihood of this occurring. So did
13 you learn something more during the break that changes your
14 response?
15 Mr. Ogawa. As far as the Gilbert method is concerned,
16 both Toyota, ourselves and Exponent did the confirmation, or
17 checked his method, and we independently reached a conclusion
18 that something like that occurring in the real world is
19 extremely rare. We didn't discuss this between Toyota and
20 Exponent to adjust our conclusions or anything like that, but
21 we reached the same conclusion.
22 Q When Ms. Tindall asked you earlier what work you
23 had done to determine the likelihood of an event like what
24 Dr. Gilbert identified as happening in the real world, you
25 said you hadn't done any testing.

1 Mr. Hester. No, no, no, no. You misunderstood what he
2 said if you think that's what -- he said he had done the
3 Gilbert work.
4 Mr. Leviss. Right. Then the question was, what have
5 you done to conclude that it's extremely rare to happen in
6 the real world? What work have you done to conclude the
7 likelihood of this occurring in the real world?
8 Mr. Hester. I think he said it was based on more
9 experience.
10 Mr. Ogawa. Were you asking about the testing for the
11 likelihood or whether or not the phenomenon can be induced
12 or --
13 BY MR. LEVISS:
14 Q I'm asking about the likelihood of its occurring.
15 Mr. Ogawa. I thought I said before the break that
16 that's not something that you could find out by testing. At
17 the least, I said we never experienced something like that,
18 or in our experience, something like that never occurred or
19 something like that.
20 After the break, I said that -- I added that we have
21 checked the -- recovered or collected ECUs and et cetera, and
22 we have been unable to find a clear track, or evidence, of it
23 occurring, or as far as accelerator pedals are concerned, we
24 couldn't find any evidence of DTC code related to that
25 occurring frequently or anything like that. So I was merely

1 repeating my conclusions. My intention was not to change my
2 testimony.
3 Q So you didn't find any evidence of DTC codes, but I
4 don't think Dr. Gilbert suggested there would be a DTC code
5 from this experiment. So what is the relevance of that
6 finding?
7 Mr. Ogawa. When I was talking about DTC, the Gilbert
8 mode only would cause unexpected acceleration when I was
9 talking about DTC, such that, under the Gilbert mode,
10 unintended acceleration would only occur if both of the
11 accelerator pedal sensors were shorted in an extremely narrow
12 range of resistance, such as 200 ohm. If you did that on the
13 bench or in the laboratory, you can target that narrow range
14 of resistance to cause unintended acceleration without
15 registering DTC.
16 But, in the real world, there are so many variances and
17 varieties of things that are going on that it would be highly
18 unlikely to control the resistance to fall within such a
19 small range. So I thought that, in that case, then DTC
20 should frequently occur, and that's why we checked the
21 collected components to see if that was the case, but we
22 could not find such instances.
23 Q You've just told us that you can't test for the
24 likelihood of this event occurring. So what is the basis for
25 saying that it's highly unlikely to occur?

1 Mr. Ogawa. VPA-1/VPA-2. These are accelerator sensors
2 1 and 2. Those wires are covered by insulating vinyl
3 material, and in order to achieve what he did, you have to
4 peel off the cover -- the coating or the vinyl material -- of
5 those two wires, and then those two lines must be connected
6 at 200-ohm resistance, and those two wires are not adjacent
7 to one another. That means that one of the wires must
8 straddle the other wire to be connected to the other wire at
9 the 200 ohm. In addition, after that, the VPA-2 must be
10 shorted at 5-volt, which is the power supply voltage.
11 So this phenomenon, the occurrence of this type of
12 phenomenon, we believe, is quite rare. Even if it occurs, we
13 would be able to see what happened because you would see the
14 evidence of wire coating being peeled off or rusted or
15 something because they are short-circuited. So that evidence
16 would not disappear and to be made available later for us to
17 find out if that was the case.
18 Q Okay. You have just described the different events
19 that have to occur for the phenomenon to take place that Dr.
20 Gilbert describes, but my question to you is, have you done
21 any testing to determine the likelihood of Dr. Gilbert's
22 phenomenon occurring in real-world conditions?
23 Mr. Ogawa. Based on our experience, something like that
24 occurring is extremely, clearly low, and so I thought there
25 was nothing -- no experiment whatsoever beyond that we could

1 do.

2 Q Okay.

3 BY MS. CHRISTIAN:

4 Q Very quickly, is your department involved in

5 participating or responding on behalf of Toyota to NHTSA

6 investigations, our National Highway Traffic Safety

7 Administration?

8 Mr. Ogawa. Our department -- my department is not doing

9 that on behalf of Toyota, but we are generally responding to

10 NHTSA's investigation.

11 Q So, back in 2004, when NHTSA opened an

12 investigation of throttle control malfunctions, did your

13 department do any testing of components or any other testing

14 in response to that investigation?

15 Mr. Ogawa. As far as I know, we did not -- I did not --

16 or our department did not do any response or anything in

17 particular.

18 Q Do you know if any department did?

19 Mr. Ogawa. Not that I am aware of, no.

20 Ms. Christian. I don't have anything else.

21 Ms. Tindall. Thank you very much for your stamina and

22 for being here with us today. We really appreciate the

23 testimony.

24 Mr. Leviss. On behalf of Chairman Waxman and of

25 Subcommittee Chairman Stupak, we thank you for your

1 cooperation and for answering our questions today.

2 Mr. Ogawa. We thank you for being patient to listen to

3 our explanations.

4 Mr. Leviss. Okay. We're done.

5 [Whereupon, at 8:46 p.m., the interview was concluded.]

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9 Ted Hester

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ERATA SHEET
FOR INTERVIEW OF TAKASI OGAWA AND HIROHISA KISHI

PAGE	LINE	CORRECTION
13	5	Add “the” before accelerator, change “petal” to “pedal.” Change requested by witness.
13	15	Change “mechanical” to “mechanism.” Change requested by witness.
22	9	Change “normal” to “abnormal.” Change requested by witness.
40	23	Change “logics” to “logic.” Change requested by witness.
41	2	Change “which” to “where.” Change requested by witness.
41	19	Change “censor-related” to “sensor-related.” Change requested by witness.
57	19	Change “whole different” to “hall effect.” Change requested by witness.
60	23	Change “censor” to “sensor.” Change requested by witness.
62	20	Change “CPS” to “CTS.” Change requested by witness.
64	12	Change “EFY” to “EFI.” Change requested by witness.
68	11	Replace question mark (?) with period (.). Change requested by witness.
78	20	Change “potential meter-type” with “potentiometer-type.” Change requested by witness.
86	1	Change “unaware” to “aware.” Change requested by witness.
88	9	Change “documents” to “document.” Change requested by witness.
89	13	Change “intended” to “unintended.” Change requested by witness.
92	16	Change “Mr. Kishi” to “Mr. Ogawa.” Change requested by witness.