

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BMW OF NORTH AMERICA, LLC AND ROBERT BOSCH LLC,

Petitioner,
v.

FORAS TECHNOLOGIES LTD,

Patent Owner.

IPR2023-01373
Patent 7,502,958

RECORD OF ORAL HEARING

Held: January 7, 2025

Before CARL W. WHITEHEAD JR., THOMAS L. GIANNETTI
and KARA L. SZPONDOWSKI, Administrative Patent Judges.

IPR2023-01373
Patent 7,502,958

APPEARANCES:

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The above-entitled matter came on for hearing on Tuesday,
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P R O C E E D I N G S

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JUDGE WHITEHEAD: Good afternoon. We are convened for oral arguments in IPR2023-01373, which pertains to the patentability challenges of claims in U.S. Patent Number 7,502,958. I am Judge Whitehead. Also appearing with me is Judge Szpondowski and Judge Giannetti.

Got a few housekeeping things to do, and then we can start (inaudible). First, let's get started with the appearances of both parties, including any LEAP practitioners. After the hearing, please confirm with the court reporter to ensure there are no questions regarding -- I'm sorry, yes, to ensure there are no questions regarding some of the names or terms.

So let's start with appearances for the Petitioner.

MR. LAVENUE: Good afternoon, Your Honor. It's Lionel Lavenue from Finnegan for BMW of North America and Robert Bosch, the Petitioners. And with me also is Xirui Zhang from my office. We're sitting in the same office using the same microphone, and she is a LEAP practitioner. This is her first argument. She will be conducting the majority of the argument. I have a few comments, and then she will take over and run the show.

JUDGE WHITEHEAD: Thank you. Patent Owner?

MR. COOPER: Thank you, Your Honor, Brett Cooper from BCLG on behalf of Foras Technologies. My colleague Robert Auchter will handle the argument today. Thank you.

JUDGE WHITEHEAD: Thank you. Okay. To prepare for your oral arguments, we have familiarized ourselves with the record and the issues in

1 this case. Remind the parties that the Petitioner has the ultimate burden of
2 establishing unpatentability by preponderance of the evidence.

3 Per the hearing order, which is Paper 27, each party has 60 minutes
4 total time to argue their case. We received the Petitioner's request for Ms.
5 Zhang (j AH ng) to participate in the hearing as a LEAP practitioner. Is that
6 the correct pronunciation, Ms. Zhang?

7 MS. ZHANG: Yes.

8 JUDGE WHITEHEAD: Okay. Thank you. Participating in an oral
9 hearing under the Legal Experience and Advancement Program, the
10 Petitioner will receive an additional 15 minutes of argument time during the
11 oral hearing, bringing their total time to 75 minutes. We remind Petitioner
12 that the LEAP practitioner must have a meaningful, substantial opportunity
13 to argue during the hearing today. That said, there is no set time
14 requirement for the argument. It may be longer or shorter than 15 minutes.
15 This will be the opening argument and rebuttal time may be reserved, which
16 may not exceed more than half of the Petitioner's total argument time.
17 Patent Owner will respond to Petitioner arguments and may reserve
18 surrebuttal time so not to exceed more than half of the Patent Owner's.

19 Please remember your arguments should be limited only to those
20 arguments previously presented in your brief. Please make it clear which
21 challenges and which claims you are addressing at all times. We ask that the
22 parties hold any objections to party arguments until it's their time to speak. I
23 will maintain a clock and try to give each party timely warnings that you are
24 near your allotted opening argument time and near the end of any reserved
25 rebuttal time. But it will be helpful for the parties to also track their time.

26 Petitioner, do you want to reserve any rebuttal time?

1 MR. LAVENUE: Yes, Your Honor, we'd like to reserve 12 minutes,
2 please.

3 JUDGE WHITEHEAD: Twelve minutes. Okay. Petitioner, you may
4 begin your argument when you're ready.

5 MR. LAVENUE: Thank you, Your Honor. So, as I noted, my name
6 is Lionel Lavenue from Finnegan for BMW and Bosch. I just have a few
7 initial comments and then I will be turning it over to Ms. Zhang, the LEAP
8 practitioner.

9 If we go to slide 3 of our demonstratives, we know that this patent,
10 the '958 patent, has several elements that are key to the dispute for today's
11 hearing. And we've color coded those from figure 1 of the '958 patent in that
12 what we have here is we have a computer system with two processors. We
13 highlighted in red the master processor and in green the slave processor.
14 And these are basically two processors that are working in tandem in order
15 to increase the speed and efficiency of the computer.

16 And what happens sometimes when you have two processors that are
17 working together is there will be an error. And there are two types of errors
18 that are denoted in the patent in figure 1. The first error is noted in blue, and
19 it is an error with respect to the processor itself. So, you might have an error
20 either in the master processor, as shown in blue, the error detect, or the error
21 that is shown in the slave processor in green, also the error detect, also
22 known as a precursor to lockstep mismatch.

23 Well, when you have those two processors operating, there's another
24 type of error that can occur and that is shown in purple. And that is a type of
25 error that happens when the two processors are not in lockstep. That is
26 called a lockstep mismatch. And so, all of this that I have explained so far in

1 figure 1, these are all things that are generally something that was known in
2 the art at the time of the filing of the patent application.

3 If we go to the next slide, we've summarized that there are two types
4 of errors that we're looking at in the patent for purposes of the claims that
5 we'll be looking at. And that is the blue denoted error in the processor and
6 the purple denoted lockstep mismatch error. And so, the question is, when
7 you have this lockstep mismatch error, when the two processors are working
8 together and have a problem between the two, well, what happens?

9 And on the next slide, on slide 5, we note that the patent discloses
10 that there is a lockstep recoverability check of can you fix the lockstep error
11 or can you not fix it? And as noted in purple, in some cases, the patent notes
12 that the lockstep mismatch error cannot be fixed and the system crashes.
13 However, the patent notes that the preferred method is to use firmware, and
14 that's shown in blue under the lockstep -- "is the lockstep recoverable; yes"
15 indicator. And so firmware determines whether or not that lockstep
16 mismatch error that we had can be fixed. And so that is really the main issue
17 that we'll be talking about today and comparing the claims to the prior art.

18 If we go to slide 6, we note that we have an example of the elements
19 that we're looking at in all of the claims, claims 1 and 19 of the independent
20 claims, that they have six main categories of things that we're looking at, and
21 the only two that are disputed are in element 2 by the Patent Owner for
22 purposes of our mapping to the prior art. And that is the Patent Owner asks,
23 well, have we shown a firmware, that's number one? And number two, have
24 we shown that there's a determination of lockstep that is recoverable in the
25 prior art? Those are really the two issues that Ms. Zhang will be looking at
26 when she compares the prior art to the claims at issue, claims 1 through 19.

1 If we go to slide 7, we note that for claims 13 and 14 through 18, the
2 Patent Owner does not present any arguments to distinguish the arguments
3 that we presented for a prima facie case of invalidity for these claims. So it's
4 our understanding that there's no dispute that claims 13 and 14 through 18
5 are admitted to be invalid by the Patent Owner. And the only issues that
6 we're looking at are the remaining claims that are challenged.

7 If we go to the next slide, slide 8, we note that --

8 JUDGE GIANNETTI: Counsel, this is Judge Giannetti. Let me just
9 go back to that. Are you suggesting that because they didn't make an
10 argument that you automatically have carried your burden on these claims?

11 MR. LAVENUE: Yes, Your Honor, we are.

12 JUDGE GIANNETTI: What do you cite for that? Do you have an
13 authority on that?

14 MR. LAVENUE: Well --

15 JUDGE GIANNETTI: Don't we still have to evaluate, even if they
16 said nothing, don't you still have to meet your burden? You don't
17 automatically win just because they didn't present an argument. You still
18 have to carry your burden.

19 MR. LAVENUE: Well, I think, Your Honor, what we're saying is
20 that we have carried our burden because we have presented, as noted in the
21 Institution Decision, a prima facie case.

22 JUDGE GIANNETTI: A prima facie case is something that we talk
23 about in prosecution. We're not talking about prosecution now. We're
24 talking about you carrying your burden, which does not shift.

25 MR. LAVENUE: Well, I --

26 JUDGE GIANNETTI: That's a misconception in your argument.

1 MR. LAVENUE: Okay. I understand, Your Honor, but it would be
2 our submission that we have met our burden because it is undisputed with
3 respect to these claims, as we had outlined in the petition and --

4 JUDGE GIANNETTI: And so, the answer is you've met your burden
5 because you presented sufficient evidence to convince us by a
6 preponderance of the evidence that your case is -- that you win your case.
7 It's not because it wasn't opposed in their papers. And you always have to
8 meet your burden. You don't win automatically. This is not patent
9 prosecution.

10 MR. LAVENUE: We'll acknowledge, Your Honor. Thank you.

11 JUDGE GIANNETTI: Okay. Thank you.

12 MR. LAVENUE: If we go to slide 8, we note that, again, we're just
13 focusing on these two elements: the firmware element and the lockstep
14 recoverability element. And these are the issues that we have today.

15 If we go to slide 9, we're going to turn to claim construction in slide
16 10. We note that in our petition, we did submit two claim terms for
17 construction, but in the Patent Owner's response and the Institution Decision,
18 there was a determination that no construction was needed for these terms.
19 And we certainly acknowledge and adopt that under the *PNC v. USAA* ruling
20 by the Board, when you have a situation where no construction is necessary
21 in order to find invalidity, then no construction is needed to be presented
22 specifically. And so, we adopt that, and we're using the "no construction
23 necessary" for these claim terms for purposes of mapping.

24 If we go to slide 11, we have outlined the grounds of unpatentability,
25 which Ms. Zhang will be going through. But before I turn it over to her, I
26 would like to note just some historical information with respect to other

1 proceedings relating to this patent. And we note that for the overview of --
2 well, before we get to that, we have the overview of the ground. We only
3 have one ground. That's *Bigbee* and *Nguyen*.

4 And if we go to the next slide, that has the overview of the other
5 proceedings with respect to this patent. We note at the bottom that there is
6 the '969 proceeding which dealt with claims 9 through 12 and 23 through 25,
7 and those are the claims that are not at issue in this IPR. In this IPR, we're
8 dealing with 1 through 8 and 13 through 22. And the three IPRs that you see
9 in the middle, those are joinder petitions or motions to terminate that have
10 dealt with those claims. But our proceeding by BMW and Bosch, it remains.

11 The '969 proceeding on claims 9 through 12 and 23 through 25, that
12 was terminated on November 6th, 2024. And that leaves one other
13 proceeding which has been stayed, and that's an EPR proceeding noted at the
14 top of this list. You'll see that claims 1 through 25 were filed on November
15 29th, 2023, for all the claims in an EPR, and the Board stayed that
16 proceeding in June 24, 2024. But we'll note that the prior art that's used on
17 the next slide is different from the prior art that we're using here.

18 So, there's no issue that there's a distinction between or an overlap
19 because we are using *Bigbee* in view of *Nguyen*. We are not using, for
20 example, ground 1 of the EPR, which is *Bigbee* alone. And as you can see,
21 *Nguyen* is not even used in the grounds that are used in the EPR. So, this is
22 a distinct issue from the EPR and considered for the first time.

23 With that, Your Honor, I'd like to go to slide 15 and turn it over to
24 my colleague, who will then walk through the claim determinations that we
25 have mapped to the two terms for ground 1. Thank you.

1 MS. ZHANG: Thank you, Mr. Lavenue. Thank you, Your Honors,
2 and good afternoon. For the next presentation -- excuse me, for the next
3 section, we'll present the ground of unpatentability, relying on the primary
4 reference *Bigbee*, and the secondary reference *Nguyen*.

5 So first, on this slide number 15, we show an overview of the *Bigbee*
6 reference. As you can see, like the '958 patent, *Bigbee* discloses a computer
7 system using lockstep processors. It has a pair of lockstep processors, and it
8 has an FRC logic that detects loss of lockstep between the processors. The
9 loss of lockstep, as Mr. Lavenue has shown previously in the claim
10 construction slides, loss of lockstep includes two types of errors. Mr.
11 Lavenue also explained in the patent, the '958 patent, loss of lockstep
12 includes two things. One is the error that is called a mismatch error detected
13 by the purple box. As we annotated earlier in the '958 package, that purple
14 box detects a mismatch error. And similar here it means, as we annotate
15 also in the purple box here, the FRC logic detects a mismatch error between
16 the processors.

17 And secondly, the FRC logic also detects errors within each
18 individual processor. This is similar to the error detector logic in the
19 individual processors for detecting errors within the individual processors.
20 This is also similar to the '958 patent. And at the same time *Bigbee* discloses
21 this FRC logic can be implemented in executable firmware, and that is
22 *Bigbee* discloses its firmware can perform the detection of both of these tests
23 of errors.

24 Moving on to slide number 16 as we have summarized here, *Bigbee*,
25 using its FRC logic, detects two types of locksteps. The first one is an error
26 within each individual processor. In *Bigbee*, this is a recoverable error and

1 *Bigbee* discloses a response to it. It has a responsive routine that uses the
2 framework to cooperate with the operating system to bring back lockstep
3 between the processors. *Bigbee*'s FRC logic, as we explained earlier, also
4 discloses detecting the mismatch errors between the processors. But *Bigbee*
5 does not disclose a response to those mismatch errors. And that is *Bigbee*
6 suggested there is no response needed for addressing those errors, but it
7 doesn't disclose the proper response. And this is where we think the
8 secondary reference, *Nguyen*, comes in in our combination.

9 In the next slide I show an overview of the *Nguyen* reference. As
10 you can see on this slide, slide number 17, we've shown the overview of the
11 *Nguyen* reference. Like the '958 patent and like the *Bigbee* patent, *Nguyen*
12 discloses a computing system that used lockstep processors. It has a pair of
13 lockstep processors and also have two error detection units. The first one is
14 called FRC checker, as we annotated as a purple box here. *Nguyen* discloses
15 this FRC checker detects mismatch errors just like the '958 patent purple box
16 as we annotated earlier in the overview of the '958 patent. In *Nguyen*, it also
17 discloses the error detectors for detecting errors in the individual processors.
18 And we also annotated at the blue box, showing it's similar to the blue box
19 error detectors as in the '958 patent. And in addition to the error detections,
20 *Nguyen* discloses determining lockstep error recoverability and then
21 responding to these different types of errors based on the determined
22 recoverability.

23 And moving on to the next slide to show how *Nguyen* determines it.
24 In *Nguyen*, as we summarize on the right, we show a chart of *Nguyen*'s
25 determination. There are three scenarios that *Nguyen* determines. One is if
26 the error detector, which is the blue box, when forwarding detects an error in

1 a processor before the purple box, FRC checker detects the mismatch error.
2 *Nguyen* determines that error is recoverable and *Nguyen* discloses it has a
3 recovery module 150 to implement a recovery routine to recover lockstep
4 between the processors.

5 And the second scenario *Nguyen* discloses is the FRC checker
6 detects a mismatch error between the lockstep processors. And the error
7 detector detects an error within an individual processor within a time
8 interval, *Nguyen* determines that error is also recoverable and the recovery
9 module 150 would implement the recovery routine to recover lockstep
10 between the two processors.

11 And lastly, in *Nguyen* it discloses if the FRC checker detects an error
12 and the error detector does not detect an error within a time interval in an
13 individual processor, *Nguyen* it discloses that error is not recoverable and the
14 proper response to that error -- non-recoverable error is to reset the system.

15 And therefore, to summarize, *Nguyen* discloses its FRC checker and
16 error detector detects both types of locks -- of lockstep as required in the
17 '958 patent, determines the recoverability of those loss of lockstep errors,
18 and is responding using its recovery module or reset module accordingly to
19 improve the system's availability.

20 JUDGE GIANNETTI: I'm sorry, Ms. Zhang. This is Judge Giannetti.
21 Do you think fairly that this diagram that you -- this composite of *Bigbee*
22 and *Nguyen*, do you think that's an oversimplification of *Nguyen*? Looks to
23 me like *Nguyen* is a bit more complicated than just determining if a lockstep
24 is recoverable. It also determines whether a lockstep is not recoverable and
25 it goes through a fairly, I would say, complex algorithm to make that

1 determination. It seems to me you've compressed that into that one diamond
2 and I wonder whether that's really a fair representation.

3 MS. ZHANG: That is correct, Your Honor. This is a summary of
4 *Nguyen's* disclosure about how it -- about the type of lockstep that is
5 detected and how it determines its recoverability or non-recoverability.
6 *Nguyen's* disclosure, the specification does have more detail in how it does
7 the determination, including the algorithms of how it determines whether an
8 error is recoverable and not recoverable. We agree there's more details of
9 how that implemented -- that is implemented.

10 JUDGE GIANNETTI: What this diagram says to me, it suggests a
11 bodily incorporation of *Nguyen* into *Bigbee*. Is that what you're really
12 proposing here?

13 MS. ZHANG: No, Your Honor, that's not what we are proposing.
14 We're proposing for the combination, as I can move to the next slide, as in
15 *Bigbee*, *Bigbee* doesn't, as we have shown earlier, *Bigbee* does not disclose
16 how to address the non-recoverable errors --

17 JUDGE GIANNETTI: Yes.

18 MS. ZHANG: -- although it discloses mismatch errors as detected. It
19 doesn't have a response for it. And so, in our combination we presented that,
20 a POSITA would have incorporated with threshold determination.

21 JUDGE GIANNETTI: A person of ordinary skill?

22 MS. ZHANG: Yes --

23 JUDGE GIANNETTI: Is that what you're talking about?

24 MS. ZHANG: -- a person of ordinary skill the in art would have been
25 motivated and find it obvious to incorporate with threshold determination if
26 lockstep is recoverable from the detected loss of lockstep to fill the gap in

1 *Bigbee*. And we have explained -- just allow me to move on to the next slide
2 to show more details of the combination. As we have shown that *Bigbee*,
3 too, detects two types of loss of lockstep, but it omits the process for
4 responding to that non-recoverable error. And so, it's a system that has a gap
5 that's ready for improvement. And *Nguyen* is a reference that teaches the
6 details -- the implementation details of how to determine the recoverability
7 of the two types of errors and how to respond to those errors.

8 *Bigbee* already discloses a response to the recoverable errors and it
9 has a very long algorithm routine to recover that lockstep. But what is
10 missing from *Bigbee* is that response to the mismatch error which is non-
11 recoverable. And that's why we're incorporating *Nguyen* and we have shown
12 that one skilled in the art would have incorporated this determination for all
13 the benefits that is claimed in the petition supported by Dr. Brogioli's
14 declaration and as also expressly taught in *Nguyen*. And that is if you
15 respond to those two types of errors differently, you would have reduced the
16 impact of those detected errors and improve the system's availability.

17 I hope that answers your question, Your Honor. And also, that
18 concludes our presentation of the combination of *Bigbee* and *Nguyen*.

19 JUDGE GIANNETTI: What evidence do you point to of why a
20 person of ordinary skill in the art would have made that combination?

21 MS. ZHANG: I'm sorry, can you repeat the question, Your Honor?

22 JUDGE GIANNETTI: I said what evidence in the record do you
23 point to that would motivate -- that indicates that there was a motivation to
24 make the kind of combination that you are proposing?

25 MS. ZHANG: Yeah, for sure. I can describe them on this slide and
26 then we'll talk about them in detail in the following presentation.

1 So, first of all, we have *Nguyen*'s disclosure. *Nguyen* in paragraph 7
2 and paragraph 8 expressly described that if you treat a non-recoverable -- if
3 you treat a recoverable error as non-recoverable, you need to reset the
4 system and that would make the system unavailable for long latency and that
5 is undesirable. So it is desirable to distinguish these two types of errors.
6 And so you only need to address -- you only need to reset the system when
7 an unrecoverable or non-recoverable error is detected. That is expressly
8 disclosed in *Nguyen*.

9 And our expert, Dr. Brogioli, has explained in his Summary of The
10 State of the Art section why one skilled in the art already know and know
11 how to address those errors differently and the benefits that come with it. In
12 Dr. Brogioli's declaration he had a section titled "Handling Recoverable or
13 Non-Recoverable Errors Differently." He has cited a few -- many references
14 of the record, including a *Safford* reference, a *Kondo* reference, and the
15 *Nguyen* reference, all those teaches that you need to address the recoverable
16 errors and non-recoverable errors differently and the benefits come with that.
17 And based on Mr. Brogioli's explanation, citing to the prior art, the petition
18 also included a section, a statement of material facts section that listed facts
19 about what was known at the time about recoverable errors and non-
20 recoverable errors and why (inaudible) -- and if you address recoverable
21 errors as non-recoverable errors, that is undesirable. If you address non-
22 recoverable errors as recoverable, that's also making the system unreliable.
23 And those facts are -- those evidence have been presented in the record of
24 this case.

25 JUDGE GIANNETTI: Can we go back to slide 15?

26 MS. ZHANG: Yes, sir.

1 JUDGE GIANNETTI: That was your *Bigbee* slide.

2 MS. ZHANG: Mm-hmm.

3 JUDGE GIANNETTI: Okay. Now, the FRC logic, my understanding
4 is that FRC is functional redundancy check, is that right?

5 MS. ZHANG: That is correct.

6 JUDGE GIANNETTI: That's a matching. (Inaudible) to see if there's
7 a mismatch error?

8 MS. ZHANG: Oh, so is your question that the FRC logic teaches the
9 mismatch error?

10 JUDGE GIANNETTI: Yes, the FRC logic. That's detecting a
11 mismatch error, right?

12 MS. ZHANG: Yes, that's correct.

13 JUDGE GIANNETTI: It says FRC logic detects both types of
14 lockstep: a mismatch error and an error within a processor. Why do you
15 think that *Bigbee*, having recognized that there could be a mismatch error,
16 doesn't address that?

17 MS. ZHANG: Yeah, *Bigbee* discloses in paragraph 33 and I can show
18 --

19 JUDGE GIANNETTI: But you say in your later slide, you've got a
20 big question mark there, lockstep, mismatch error. This is the next slide. A
21 big question mark there. Why is it that he doesn't address that?

22 MS. ZHANG: Yes, that's a good question, Your Honor. The FRC
23 logic detects mismatch errors. *Bigbee*, this reference focuses on handling
24 recoverable errors to improve the system's availability. Your Honor, a
25 person of ordinary skill in the art is a person with common knowledge of art.
26 And as Dr. -- Mr. Brogioli has explained that many references teaches you

1 need to address the mismatch errors and those are non-recoverable errors.
2 He has a section describing what happened if mismatch errors are non-
3 recoverable and how do you address them, including reset and reinitialize
4 the system. *Bigbee* does not disclose that. That's because that's the common
5 knowledge that people know. It focuses on recovering the recoverable
6 errors. But this is a gap in *Bigbee* (inaudible) knowledge and also this was
7 known at the time by a person of ordinary skill in the art. And this is
8 disclosed in the *Nguyen* reference.

9 JUDGE GIANNETTI: Well, your chart suggests that the only errors
10 that really are addressed by *Bigbee* are errors within the processor, processor
11 errors.

12 MS. ZHANG: Yes.

13 JUDGE GIANNETTI: The big question mark there saying, you
14 know, we don't know what *Bigbee* would say about a lockstep mismatch
15 error and whether that's recoverable or not or how to recover from it. Is that
16 your reading of *Bigbee*?

17 MS. ZHANG: Yes. When we read about *Bigbee*, it doesn't describe a
18 response to it. But that doesn't mean that a POSITA, a person of ordinary
19 skill in the art, does not know how to respond to it. In fact, the prior art
20 teaches if it is a mismatch error or non-recoverable error, you would have a
21 response. That response is reset the system. The fact that *Bigbee* does not
22 mention that is a gap of *Bigbee* that we acknowledge.

23 JUDGE GIANNETTI: So you say that because the prior art showed
24 that you had to reset the system, a person of ordinary skill would have turned
25 to something like *Nguyen*, which could actually recover from that kind of
26 error. Is that your argument?

1 MS. ZHANG: That is correct.

2 All right. Thank you.

3 MS. ZHANG: Thank you, Your Honor. And with that overview of
4 our combination, the next section of our presentation, we'll talk about the
5 parties' limited disputes. There are only two disputed issues, but before
6 jumping to the details of the disputed issues, we have a slide summarizing
7 here of what's not disputed in the record. So, we have a list of things
8 summarized here and we want to go through them at a high level.

9 So first of all, the Petitioner has a section of Statement of Material
10 Facts in the petition and Patent Owner has not disputed to any of the facts
11 listed in that section.

12 JUDGE GIANNETTI: Does that mean that they are automatically
13 admitted? My understanding under our rules is it's not like a request to
14 admit where if you don't deny it, it's admitted.

15 MS. ZHANG: Yes, Your Honor. There is a case before and the
16 Board has previously held, according to Rule 42.23(a), that if the facts in the
17 Statement of Material Facts section is not disputed, that it's considered
18 admitted.

19 And the second point about -- that Patent Owner does not dispute is
20 Dr. Brogioli has a specific section about a Summary of the State of the Art,
21 describing what was known and common knowledge of lockstep processors
22 and handling lockstep processor errors. Patent Owner does not dispute any
23 of those discussions.

24 And thirdly, as Mr. Lavenue mentioned, we have proposed claim
25 construction for two terms that's consistent with the specification and the
26 claim language and Patent Owner has now presented (inaudible).

1 And fourth, in the petition we have presented a definition of level of
2 ordinary skill in art. Patent Owner, while in their response they presented
3 definitions, similar definitions, and they also did not dispute about our
4 definition. And we'll look at them at the end of the presentation, too.

5 And fifth, as we have shown that *Bigbee* discloses all the other
6 components of the claims that Patent Owner does not dispute, we
7 acknowledge that *Bigbee* does not disclose determining if lockstep is
8 recoverable, so there's no dispute about that.

9 And sixth, there's no dispute about *Nguyen* discloses determining if
10 lockstep is recoverable and that we will discuss that later, too. Patent
11 Owner's response describes how *Nguyen* determines if lockstep is
12 recoverable or not recoverable.

13 And seventh, as Mr. Lavenue mentioned, Patent Owner did not
14 present any arguments for claims 13 to 18, and those claims do not recite
15 determining if lockstep is recoverable.

16 And finally, Patent Owner did not offer any secondary
17 considerations.

18 Now, moving on to slide number 23, and you have seen this chart
19 before about this. You have seen this summary of the claim components
20 before and we have summarized the claims -- independent claims into six
21 core components. And there's no dispute that *Bigbee* disclosed the number 1
22 and 3 through 6 components. The disputed issues focus on this number 2
23 with firmware for determining if lockstep is recoverable. And hopefully, as
24 we have shown you, as we discussed before, *Bigbee* discloses its FRC logic
25 can be firmware and also *Nguyen* discloses determining if FRC logic is
26 recoverable. And a combination is to incorporate *Nguyen*'s determination in

1 *Bigbee* using *Bigbee*'s firmware to determine if lockstep is recoverable for
2 the benefit of addressing the different errors differently to make *Bigbee* a
3 more complete and robust system.

4 JUDGE GIANNETTI: Counsel, in your view, is the real dispute here
5 about the motivation to combine these references?

6 MS. ZHANG: In our view -- sorry, Your Honor.

7 JUDGE GIANNETTI: Is that what we're talking about here,
8 motivation to combine these two references?

9 MS. ZHANG: In our view, although Patent Owner did argue about
10 motivation to combine, in our view, the argument is not about motivation to
11 combine, as we will show you later, Your Honor. Patent Owner agreed with
12 the benefits -- I'm sorry, agreed with the benefit of handling the errors
13 differently. That's our motivation to combine. And so we think Patent
14 Owner does not dispute about motivation to combine, but Patent Owner is
15 arguing about a combination that they misconstrued and that's not our
16 combination.

17 JUDGE GIANNETTI: So what is your understanding of their
18 position then if there's not a dispute about how these references work? It
19 doesn't sound like it. I mean, I think there's agreement about what they
20 teach. But the question is whether they are fairly combinable. Isn't that
21 really what the dispute is, whether one would combine them? That's what I
22 see in the papers. So maybe I'm missing something, but how do you see it
23 from your standpoint? What's the difference?

24 MS. ZHANG: From our standpoint -- yeah, sorry. From our
25 standpoint, the issues that are disputed are shown on this slide. As you can

1 see on the left are the two issues, title owner dispute. They're not saying
2 their preferences are not combinable.

3 JUDGE GIANNETTI: So whether if they were combined, assuming
4 that they were combined, whether they perform what is recited in the claim.
5 Is that what you would say?

6 MS. ZHANG: Yes.

7 JUDGE GIANNETTI: Okay. And can you relate that to the language
8 of the claim? What exactly is the language?

9 MS. ZHANG: Mm-hmm.

10 JUDGE GIANNETTI: Determining if the lockstep is recoverable,
11 that's what the claim language is, right?

12 MS. ZHANG: Yes, that's correct. Use a firmware for -- firmware
13 code for determining if lockstep is recoverable.

14 JUDGE GIANNETTI: So their contention is that even if these
15 references were combined, they would not meet that in that they would not
16 determine if lockstep is recoverable. Is that your understanding?

17 MS. ZHANG: Yes, they are arguing about a combination, whether
18 that would arrive at the claim language.

19 JUDGE GIANNETTI: And what is the second issue that you see
20 here? Where the person of ordinary skill would have used *Bigbee's*
21 firmware for determining lockstep error, that suggests a combination, a
22 motivation to combine, doesn't it?

23 MS. ZHANG: First of all, we'll talk about it later, but we would like
24 to address it now, since you asked about it. So *Bigbee* discloses its FRC
25 logic can be implemented in firmware. So *Bigbee* already discloses
26 firmware.

1 JUDGE GIANNETTI: Right.

2 MS. ZHANG: We think there's no motivation to modify *Bigbee* to
3 add firmware because *Bigbee* already discloses firmware. So *Bigbee* in our
4 combination, *Bigbee*'s firmware is used to implement the functions involved
5 in the determination of recoverability.

6 JUDGE GIANNETTI: Well, isn't it a dispute that there's software
7 involved in *Bigbee* in performing whatever functions it performs?

8 MS. ZHANG: Sorry, can you say that again?

9 JUDGE GIANNETTI: I'm saying that *Bigbee* -- is there a dispute
10 over whether *Bigbee* discloses software? Put aside the question of whether
11 it's firmware or some other type of software, but programming to determine
12 whether there's a lockstep error. Is the dispute over whether it's firmware or
13 some other type of software?

14 MS. ZHANG: No, it's not about that. I think the argument from
15 Patent Owner is that you wouldn't use firmware for its alleged
16 disadvantages. According to Patent Owner, there are disadvantages of using
17 firmware. For example, one of the reasons they gave is there's more
18 opportunity for introducing errors, like all other software program
19 applications.

20 JUDGE GIANNETTI: I see.

21 MS. ZHANG: So that's the issue that Patent Owner raised.

22 JUDGE GIANNETTI: All right. We'll hear it from them. But it
23 seems to me that if the issue is whether it's software, some -- firmware or
24 some other kind of software, it seems to me that's a pretty close question.
25 We'll hear it from them in a few minutes. Go ahead. Thank you.

1 MS. ZHANG: Thank you. Moving on to slide number 4 [sic], we
2 have talked about it a little bit just now, about Patent Owner's response, and
3 we summarize here with respect to the two issues. So, with respect to the
4 first issue, whether *Bigbee* combined with *Nguyen* would handle recoverable
5 errors differently from non-recoverable errors, Patent Owner's argument
6 focuses on the combination. So, they argued *Bigbee* combined with *Nguyen*
7 would only handle recoverable errors detected in their respective processors
8 in step 404 of figure 4A of *Bigbee*. That's their main argument focusing on
9 step 404 of figure 4A.

10 And the second with respect to the second issue, whether a POSITA
11 would have used the *Bigbee*'s firmware for determining lockstep error
12 recoverability. Patent Owner's argument is that implementing *Nguyen*'s FRC
13 checker unit, the compare unit in FRC checker, in firmware would have
14 disadvantages, such as adding complexity, expense, and introduce more
15 errors. And as the Board has correctly found in the Institution Decision, that
16 petition -- the Petitioner has shown that combination addresses these two
17 issues and it's shown that claims are obvious over *Bigbee* and *Nguyen* for of
18 the purpose of the institution. And hopefully, today, we'll show that we have
19 met our burden to show you their claims aren't tenable.

20 And now we're moving on to discuss these disputed issues in more
21 detail. With respect to the first issue and our answer, hopefully, will show
22 you in the petition the answer to this issue is yes. And in *Bigbee* combined
23 with *Nguyen*, when *Bigbee* incorporates *Nguyen*'s determination it will
24 handle the recoverable errors and non-recoverable errors differently because
25 that was known in the art for the benefit of addressing different errors
26 differently.

1 And then moving on to the next slide, we just wanted to give you a
2 high-level overview of what's now disputed by title owner with respect to
3 this issue, and we'll go through each of them in detail in the next few slides.
4 So first of all, Patent Owner does not dispute that *Nguyen* discloses
5 determining lockstep recoverability. And second, Patent Owner also does
6 not dispute *Bigbee*'s errors detected in individual processors is similar to
7 *Nguyen*'s recoverable error.

8 And lastly, Patent Owner also agrees with the benefits for
9 distinguishing recoverable and non-recoverable errors as explained in the
10 petition and by Dr. Brogioli, our expert. And we'll talk about each of these
11 in more detail in the next few slides.

12 Regarding the slide number 27, as you can see, this is related to the
13 first point that Patent Owner does not dispute. Patent Owner on the left
14 describes how *Nguyen* discloses whether -- how it determines an error is
15 non-recoverable or recoverable. This is consistent with our summary of the
16 determination as we've presented in this chart here. This is about the
17 determination of whether one is recoverable and non-recoverable and
18 *Nguyen*'s response. And, therefore, we think Patent Owner does not dispute
19 that *Nguyen* determines recoverability of lockstep errors.

20 Moving on to the next point, Patent Owner and its expert Mr. Jones -
21 - I'm sorry, moving on to slide number 28. Patent Owner and Mr. Jones also
22 denotes the biggest error detected in individual processor is similar to
23 *Nguyen*'s recoverable error. And on the left is Patent Owner's response
24 when it describes the error detector 140 in *Nguyen*. It said that the error
25 detector detects the soft errors in these arrays and then further described --
26 *Bigbee* similarly described these errors in the individual processors. So, the

1 Patent Owner is saying that *Nguyen's* recoverable errors are similar to
2 *Bigbee's* recoverable error detected in individual processors, and we agree
3 with that, as we illustrated. *Bigbee* discloses error detected within the
4 individual processor that's recoverable and *Bigbee* has a response for
5 recovering lockstep. And similar to *Nguyen's* first type of error that is the
6 error detected in an individual processor and *Nguyen* discloses that is
7 recoverable and we need to recover the lockstep between the processors.

8 And moving on to slide number 29, regarding the third point, so
9 Patent Owner, I want to mention about, are they really arguing about
10 motivation to combine? Here we think Patent Owner does not dispute about
11 the benefits of distinguishing recoverable and non-recoverable errors as we
12 have explained for the combination in the petition and by Mr. -- by Dr.
13 Brogioli. As noted before, we had a Statement of Material Facts section
14 describing what was known in the art and, as we said, that it was known that
15 treating a non-recoverable error as a recoverable error would have
16 (inaudible) the system's reliability and it was known that treating a
17 recoverable error as a non-recoverable error would have (inaudible) the
18 system's availability.

19 And in Dr. Brogioli's Summary of The State of the Art section he
20 also explained whether -- determining whether lockstep is recoverable was
21 known citing to the references of record in this case. He also described --
22 explained permanently recoverable or non-recoverable errors differently was
23 known and how that was done in the prior art.

24 And, Your Honor, a person or ordinary skill in the art is a person
25 with common knowledge, as we mentioned before for the *KSR* case. And
26 Patent Owner in their sur-reply on the right also said Patent Owner has now

1 argued that a person of ordinary skill in the art would have failed to
2 recognize the potential benefits of handling recoverable and non-recoverable
3 errors. It's simply arguing that the combination that they construed that can
4 now make the distinction, but they are not arguing against the benefits of
5 doing that.

6 As we go back to our combination again, on slide number 30, we
7 have seen this slide before about our combination. And going back to this
8 again, *Bigbee*, as we have described, has a gap of -- it doesn't have the
9 response for responding to the mismatch errors. Therefore, *Bigbee* is a
10 system ready for improvement and *Nguyen* discloses a known solution to
11 address both recoverable and non-recoverable errors and to provide the
12 known benefits of reducing the impact of those detected errors and include
13 system availability. And this is -- according to the *KSR* case, this is a mere
14 application of a known technique to a piece of prior art that's ready for
15 improvement.

16 Now, as we mentioned, Patent Owner's argument is about a
17 combination and they have three main arguments about the combination, as
18 we summarize here and we will talk about each of them. So, the first one
19 they argued is *Nguyen* would only handle recoverable errors detected in the
20 respective processors instead 404 of *Bigbee*'s figure 4. A second they argue
21 *Bigbee* has already determined if lockstep is recoverable. And lastly, they
22 argue that Dr. Brogioli said that the combination begins with step 404 of
23 *Bigbee*, and that is incorrect. And then, hopefully, we'll show you that all
24 these arguments fail because they misconstrue our combination and does not
25 address our combination of *Bigbee* in view of *Nguyen*.

1 Moving on to slide number 32, the first point Patent Owner made is
2 that the combination, *Bigbee* in view of *Nguyen*, would only handle
3 recoverable errors detected in the respective processors in step 404 of
4 *Bigbee*. We argue that *Nguyen* will never determine that lockstep is non-
5 recoverable.

6 Your Honor, the prior art must be considered for all its features. As
7 we have shown here, *Bigbee* discloses detecting mismatch errors and
8 *Nguyen* discloses determining whether a mismatch error is recoverable or
9 non-recoverable. Therefore, they're not addressing our combination.
10 They're merely focusing on what the similarity is between *Bigbee* and
11 *Nguyen*, which we agree, but they are ignoring the rest of the disclosures in
12 *Bigbee* and *Nguyen*.

13 And just going back to our combination again, Your Honors, as we
14 have seen in the graph shown on the left, as we presented in the petition, the
15 combination starts with a detection of loss of lockstep. And as we have
16 explained earlier, loss of lockstep includes two paths of errors, both of which
17 is detected by *Bigbee*'s FRC logic, which is firmware. It detects the error
18 within the individual processors which is recoverable and detects mismatch
19 errors, but *Bigbee* does not disclose responding -- a response to those
20 mismatch errors.

21 On the other hand, *Nguyen* discloses a determination and responding
22 to those errors. So, the incorporation of *Nguyen*'s determination and
23 response to non-recoverable errors would improve *Bigbee*'s system, making
24 it more robust and complete by addressing both types of errors.

25 Moving on to slide number 34 regarding Patent Owner's second
26 argument. Patent Owner, through Mr. Jones' testimony said, "*Bigbee* has

1 already determined if lockstep is recoverable." That is incorrect. As we
2 have shown and also on this slide on the right *Bigbee* discloses detecting
3 both types of errors. It has a response from (inaudible) to respond to the
4 error as it's recoverable in the individual processors. It does not have a
5 determination whether that response -- whether that error is recoverable or
6 non-recoverable.

7 Moving on to slide number 35 about the third point that Patent
8 Owner made. In an effort to characterize Dr. Brogioli's declaration, on the
9 left it shows Patent Owner's response. Patent Owner argues that the
10 combination allegedly follows the following process: it begins with step 404
11 of *Bigbee* and following the detection. That is not correct. As you have
12 seen in our combination, the combination starts with detection of loss of
13 lockstep. And that loss of lockstep includes two types of errors: a
14 recoverable error, that's error detected in the individual processors, and also
15 non-recoverable errors, that's the mismatch error that's not addressed in
16 *Bigbee*. And Dr. Brogioli explained that *Bigbee* detects non-recoverable
17 errors, but it does not disclose addressing those errors.

18 And during the presentation Dr. Brogioli explained again that the
19 combination is to incorporate *Nguyen's* determination by *Bigbee*, so that
20 *Bigbee* system, the error is detected at *Bigbee* either recoverable or
21 recoverable [sic] will be addressed and for the benefits that come with them.

22 So to summarize, all of Patent Owner's arguments would fail because
23 they do not address our combination, which is to incorporate *Nguyen's*
24 determination of recoverability into *Bigbee*, so that *Bigbee's* system can be
25 improved and to address both types of errors and for the benefit of
26 improving the system's availability.

1 Now, moving on to slide number 37, Patent Owner in its response
2 did have a separate section against claim 8. Claim 8 recites, "if determined
3 that a lockstep mismatch has occurred between the lockstep pair of
4 processors, then determining that loss of lockstep is not recoverable." And
5 as we have shown in *Nguyen*, *Nguyen* discloses when a mismatch error is
6 detected and no error detecting the processor within a time interval, *Nguyen*
7 discloses that error, determining that error is not recoverable, and need to
8 reset the system.

9 Moving on to slide number 38, again Patent Owner relies on the
10 same argument based on the same misconstrued combination about *Bigbee*
11 and *Nguyen*. We argue that the combination starts with detection of a
12 recoverable error and that's it. But that's not our combination. As we have
13 shown again on the right, the combination is detecting loss of lockstep down
14 those two types of errors and incorporating *Nguyen*'s determination so that
15 the *Bigbee* system would be improved to address both types of errors.

16 With that, that concludes our discussion of the first issue and there
17 will be the second issue regarding the firmware. And we discussed this
18 previously a little bit about why do we need motivations to modify *Bigbee* to
19 add its firmware functionality, and the answer is we don't. In fact, *Bigbee*'s
20 firmware, FRC logic firmware, detects both types of errors and those are the
21 functions that's used in *Nguyen*'s determination. But to the extent we need to
22 add motivation, we have presented a motivation in the petition and
23 supported by Dr. Brogioli's declaration, and we'll talk about that in the next
24 few slides.

25 Moving on to slide number 40, again we wanted to highlight a few
26 non-disputed issues. First, Patent Owner does not dispute that *Bigbee*

1 discloses firmware to implement the FRC logic. That is in paragraph 34 of
2 *Bigbee*.

3 Second, Patent Owner does not dispute it was known to use firmware
4 to detect processor errors, determine error severity, and implement recovery
5 routines. That is discussed in the petition and by Dr. Brogioli in his
6 Summary of The State of the Art section.

7 Lastly, Patent Owner's expert, Mr. Jones, also agrees with our expert
8 on the benefit of using firmware. And we'll look at each of them in the next
9 few slides in detail.

10 Moving on to slide number 41, here we show that *Bigbee* discloses
11 the FRC logic can be implemented using executable framework, and this is
12 now disputed by Patent Owner. *Bigbee*, also -- and *Bigbee*'s disclosure has a
13 lot of information. It also uses its firmware for performing all the other
14 functions recited in other claims, which is not the issue disputed here, but we
15 know that *Bigbee* does describe its firmware and can perform various
16 functions.

17 Moving on to slide number 42 regarding the second point that Patent
18 Owner does not dispute. Again, as we have presented in our Statement of
19 Material Facts section, which is now disputed, that section includes facts
20 about firmware. It says -- in one of the facts listed it says firmware could be
21 used for detecting lockstep errors and also firmware could be used for
22 handling processor errors. And those facts are supported by Dr. Brogioli's
23 Summary of The State of the Art section in his declaration, citing to
24 objective evidence, references of record in this case. Those are all the
25 common knowledge of one skilled in the art about handling -- detecting

1 errors and handling errors. And Patent Owner has now disputed to any of
2 those discussions or facts.

3 Lastly, as we have discussed before, we don't need a motivation for
4 modifying *Bigbee* to add firmware function because *Bigbee*'s FRC logic
5 already detects the errors used for the determination. But to the extent we
6 need to, and we have shown that, our expert, Dr. Brogioli, has explained that
7 firmware is more flexible. It can be modified after production, updated and
8 supported quickly and inexpensively as compared to hardware. And Patent
9 Owner's expert, Mr. Jones, said, "I agree with Dr. Brogioli that firmware is
10 more flexible and more easily modified."

11 JUDGE GIANNETTI: Counsel, let me interrupt again. I think this
12 relates to -- this Judge Giannetti again, it relates to a question I had earlier.
13 Is the argument here firmware versus hardware or is it firmware versus some
14 other sort of programming other than firmware programming?

15 MS. ZHANG: It's firmware versus hardware, yes.

16 JUDGE GIANNETTI: Okay. Thank you.

17 MS. ZHANG: Thank you, Your Honor. And in our petition and Dr.
18 Brogioli has explained that firmware and hardware or a combination of
19 firmware and hardware are all suitable options because *Bigbee* discloses it.
20 And Mr. Jones also agreed firmware is a suitable option. He acknowledged
21 the benefit of using firmware, while he also mentioned some potentially
22 disadvantages of using firmware. But the fact that firmware has some
23 disadvantages does not negate the obviousness to use firmware, does not
24 negate motivation to use firmware as a suitable option.

25 In fact, Mr. Jones is not arguing that it would be beyond a person of
26 ordinary skill in art to use firmware. All he's arguing about is there are some

1 disadvantages of it and that does not negate obviousness. As the Court
2 previously has said, the prior art options -- the prior art method does not
3 need to be the best option as long as it's a suitable option, as is disclosed in
4 the prior art.

5 And therefore, to summarize, and going back to our summary slide
6 of the two disputes -- I'm sorry, going back to -- or now going ahead to slide
7 number 45, which shows a summary of the two disputed issues and Patent
8 Owner's response.

9 Your Honor, as we have shown you with respect to the first issue,
10 whether *Bigbee* combined with *Nguyen* would handle recoverable errors
11 differently from non-recoverable errors, Patent Owner's response ignored the
12 whole combination. Yes, *Bigbee* discloses recoverable errors and, yes,
13 *Nguyen* discloses recoverable errors, but that's not a combination. The
14 combination does not start from just mere detection of the recoverable
15 errors. The combination is *Bigbee* does not address non-recoverable errors
16 and one skilled in the art would be motivated to incorporate determination
17 and respond to the non-recoverable errors. Therefore, Patent Owner misses
18 the whole combination.

19 And second, with respect to whether a POSITA would have used
20 *Bigbee*'s firmware for determining lockstep error recoverability, in fact, all
21 the reasons about disadvantages, we don't need to address the motivation to
22 combine, but if we do, Mr. Jones' argument does not negate the obviousness.
23 And in fact, Mr. Jones himself testified in his declaration how you do that.
24 He stated that if you use a firmware, you would do a bit-by-bit comparison.
25 That is using firmware which it's within the ordinary skill in the art. It is

1 merely writing firmware code to achieve a known function that would be
2 within the ordinary skill in art.

3 So, hopefully, as I wrap up the discussion with the prior art and
4 disputed issues, we hope we have persuaded you that we have met our
5 burden to show the claims are unpatentable over the combination of *Bigbee*
6 and *Nguyen*.

7 Moving on to slide number 46. There's another reason today that we
8 would like to present and ask Your Honor the find for Petitioner, and that is
9 about the expert credentials of Mr. Jones. We have -- in slide number 47 we
10 list a number of reasons that -- why you should give Mr. Jones' declaration
11 little or no weight, and we'll focus on his credentials for the presentation.
12 But if you would like to discuss any of the other reasons we presented in our
13 papers, we can circle back to them.

14 And now I'd like to --

15 JUDGE GIANNETTI: Counsel, before you get into this, did you
16 object to Mr. Jones' testimony, file an objection at the appropriate time?

17 MS. ZHANG: No, we did not.

18 JUDGE GIANNETTI: Rule 702?

19 MS. ZHANG: No, we did not.

20 JUDGE GIANNETTI: Did you move to exclude it?

21 MS. ZHANG: No, we did not.

22 JUDGE GIANNETTI: So what's your basis for saying that we should
23 give it no weight?

24 MS. ZHANG: We think Your Honors should have their comparison
25 and consider Mr. Jones' testimony and see how his testimony is lacking

1 basis. And we think Your Honors should have the benefit of considering
2 that as compared to our expert declaration.

3 JUDGE GIANNETTI: Well, isn't no weight the equivalent or
4 functionally the same thing as excluding it? I mean, I can see an argument
5 that we ought to take his background into account in evaluating his
6 testimony. But it seems to me your argument goes a little too far in saying
7 that we should give it no weight, especially, in fact -- in view of the fact that
8 you haven't objected to it and you haven't moved to exclude it.

9 MS. ZHANG: Yes, Your Honor. Our argument is that you should
10 give it little weight or no weight. And then we also argue that to the extent
11 you consider Mr. Jones as an expert, we should give our expert more weight
12 as our expert has recent (inaudible).

13 JUDGE GIANNETTI: That's a different argument, though, isn't it?
14 I'm addressing myself to the -- I agree with your argument that we should
15 certainly consider his qualifications up against your expert's qualifications as
16 one basis for evaluating his testimony. Not the only basis, but one basis for
17 evaluating it. But you've asked us to give it no weight, and I have problems
18 with that argument when you haven't objected to it and haven't moved to
19 exclude it.

20 MS. ZHANG: Thank you, Your Honor. We acknowledge that and
21 we do argue that you should give more weight to our expert's declaration,
22 Dr. Brogioli's declaration.

23 JUDGE GIANNETTI: Okay. Thank you.

24 MS. ZHANG: And now I jump ahead to slide 51. On slide 51 we've
25 shown here is our definition of one skilled in the art. On the left is what we
26 presented in the petition and we said that a person of ordinary skill in the art

1 would have at least a bachelor's degree in computer science, computer
2 engineering, or equivalent, and at least two years of prior experience with
3 computer architecture design, including fault tolerant computer architecture
4 design. The Board adopted this definition in the Institution Decision.

5 In Patent Owner's response, Patent Owner did not dispute about its
6 definition and Patent Owner gave a similar definition. Patent Owner said a
7 person of ordinary skill in the art would have the equivalent of a bachelor's
8 degree in computer science, computer engineering, or related fields, and
9 approximately two years of work experience with computer architecture
10 design.

11 And moving on to slide number 53, and if we look at Patent Owner's
12 expert, Mr. Jones', credentials, he has a -- Mr. Jones has a bachelor's degree
13 in electrical and mechanical engineering from 1983. He does not have the
14 required education of a computer engineer on computer science or
15 equipment. He also mentioned his work experience from 1995.

16 JUDGE GIANNETTI: Counsel, let me interrupt you here. I'm not
17 disputing your definitions here, but in many universities, I don't know
18 whether that's true in the case of Mr. Jones, but in many universities
19 computer courses are taught in the electrical engineering department. So the
20 fact that he majored in electrical engineering rather than computer
21 engineering doesn't mean that he doesn't have a background or training in
22 computer engineering. And I can say from personal experience that in many
23 universities, the electrical engineering department encompasses also
24 computer engineering.

25 MS. ZHANG: Yes, Your Honor, I agree that some universities do
26 offer computer engineering courses to some other majors, like electrical

1 engineering. But that's my point. The point is, one, that Patent Owner has
2 the burden to show that the expert is qualified. Even if they agree with the
3 definition of computer engineering and computer science, they have not
4 shown that their expert's degree is equivalent.

5 And also, as to the second point, the definition requires the education
6 and two years of work experience. And as he has listed here, that work
7 experience, none of those is related to computer architecture design -- two
8 years of work experience with computer architecture design, which they
9 have agreed and does not dispute.

10 JUDGE WHITEHEAD: Counselor, this is Judge Whitehead. Sorry,
11 interrupt to you. (Inaudible).

12 MS. ZHANG: I'm sorry, Your Honor, you cut off a little bit. Can you
13 repeat the question?

14 JUDGE WHITEHEAD: Yes. You have less than five minutes
15 remaining.

16 MS. ZHANG: Okay. Thank you, Your Honor. Yeah, I'm about to
17 finish. I have one last slide to show.

18 And in an effort to try to show that Mr. Jones is qualified, in the sur-
19 reply Patent Owner did list of number of court cases that he has testified.
20 But as we highlighted, as annotated here, none of those experiences relate to
21 computer architecture design. That's the last point I would like to make
22 about Mr. Jones' credentials.

23 And now I would like to -- just one minute, Your Honors, I have
24 something to say. So, we did mention about a case cite about a material fact
25 section, and that is the AVX (phonetic) court and their procedural
26 components. And we have cited that case in our reply.

1 JUDGE SZPONDOWSKI: Counsel, is that a precedential case?

2 MS. ZHANG: It is a PTAB case.

3 JUDGE SZPONDOWSKI: Is it precedential?

4 MS. ZHANG: No, it's not a precedential case.

5 JUDGE SZPONDOWSKI: Okay. Thank you.

6 MS. ZHANG: Yeah. So that case said that because Patent Owner did
7 not dispute about the facts listed in the Statement of Material Facts section,
8 and accordingly, all of the facts listed in the Statement of Material Facts
9 section are considered admitted.

10 And then just to conclude our presentation today, our last slide
11 shows the record of the case. Hopefully, today, Your Honors, we have
12 shown you the entire record shows the challenge claims are unpatentable.
13 We have presented the non-disputed state of the art about recoverable --
14 about lockstep processors and handling the errors of lockstep processors.
15 We have shown you we have admitted no material -- Statement of Material
16 Facts. We also have recent testimony of a qualified expert, and his
17 testimony is supported by 14 additional background references. And
18 hopefully, we have persuaded you that our combination is merely using a
19 known technique to improve a system ready for improvement and show that
20 there is expectation of success for adding that additional solution to the
21 primary reference.

22 And as compared to the record as the evidence we have put into the
23 record, Patent Owner has presented the two things. The first is we have
24 presented an unsupported and conclusionary testimony from an unqualified
25 expert. He has not cited to any objective evidence. And also Patent Owner's
26 two disputes, there are only two disputed issues, both of them are focusing

1 on misconstrued combination and both of them fail because they don't
2 address our combination and they agreed with our motivation to combine.

3 For all these reasons, we ask your Board to find -- Your Honors to
4 find our challenged claims -- the challenged claims unpatentable. And we
5 reserve the rest of the time for rebuttal.

6 JUDGE WHITEHEAD: Counselor, thank you. Can you hear me?
7 Hello?

8 SPEAKER: He said can you hear me?

9 MS. ZHANG: Oh, yes, I can hear you, sir. I'm sorry.

10 JUDGE WHITEHEAD: Thank you. Thank you. Any other
11 questions we have before we go to the Patent Owner?

12 Patent Owner, do you want to reserve any time for rebuttal?

13 MR. AUCHTER: Yes, Your Honor. We'd like to reserve 10 minutes,
14 please.

15 JUDGE WHITEHEAD: Ten minutes?

16 MR. AUCHTER: Yes, Your Honor.

17 JUDGE WHITEHEAD: Thank you. You may begin when you're
18 ready.

19 MR. AUCHTER: Thank you, Your Honor. To begin with, Your
20 Honor, I'd like to address what the Patent Owner's arguments are here. The
21 Patent Owner's arguments are that the combination, so-called the combined
22 system, would not detect recover -- would not be able to distinguish between
23 recoverable and non-recoverable errors. And it is because of that inability to
24 distinguish between recoverable and non-recoverable errors that a person of
25 ordinary skill in the art would not be motivated to make the combination of

1 the *Bigbee* and *Nguyen* references as disclosed in the petition at, for
2 example, pages 28 and 29 of the petition in particular.

3 JUDGE GIANNETTI: Counsel, I think you're combining two
4 arguments there. I was trying to get to that with Ms. Zhang. But I think
5 you're really combining two arguments there. One is the argument that they
6 wouldn't be motivated to make the combination. And then the second
7 argument is even if they were to make the combination, that it wouldn't
8 achieve what is claimed. Is that my -- is my analysis off or -- you seem to be
9 conflating these two things.

10 MR. AUCHTER: It's slightly different than that, Your Honor. It's
11 that they wouldn't -- a person of ordinary skill would not have been
12 motivated to make the combination because the combination would not
13 achieve the objectives that they identified as what would have been desirable
14 or deemed desirable to a person of ordinary skill in the art. In particular, the
15 ability to distinguish between recoverable and non-recoverable errors.

16 JUDGE GIANNETTI: So it wouldn't work. It wouldn't work.

17 MR. AUCHTER: Yes, Your Honor, it would not work.

18 JUDGE GIANNETTI: And a person of ordinary skill would
19 recognize that it wouldn't work. Is that what you're saying? Why would
20 they ever make the combination if they didn't -- if they didn't think it was
21 going to work?

22 MR. AUCHTER: Your Honor, why a person would make a
23 combination that didn't work is something I don't know. What I do know is
24 that the combination's combined system as disclosed in the petition would
25 not work to distinguish between recoverable and non-recoverable errors

1 because the errors that would be detected under *Bigbee* would be the
2 recoverable errors and not the non-recoverable errors.

3 JUDGE GIANNETTI: Well, I'm trying to put your argument in the
4 context of the well-known obviousness cases like Graham against John
5 Deere. It sounds to me like you're -- all right, let me go off a little bit here.
6 It sounds to me like your argument is a reasonable expectation of success.
7 In other words, a person of ordinary skill in the art wouldn't make this
8 combination because they would not reasonably expect it to work. Is that it?
9 I'm trying to fit your argument into the case law here, and I'm not having
10 much success the way you phrased it, so I'm trying to recast it in a way that's
11 more comprehensible to me.

12 MR. AUCHTER: It's my understanding, Your Honor, that a
13 reasonable expectation of success would be considered more generically, if
14 you will, as in whether or not you're in a predictable or unpredictable art of
15 things of that nature. Whereas we are focusing on the specific combination
16 that was proposed by Petitioners in this case as opposed to what would have
17 been possibly within the capability of a person of ordinary skill in the art at
18 the time in 2004.

19 JUDGE GIANNETTI: So you're talking about that diagram that I was
20 questioning your opponent about, the one with the diamond in the middle.
21 And I said, well, maybe that's an oversimplification. Is that what you're
22 basing your argument on?

23 MR. AUCHTER: Yes, Your Honor. It's in the petition on page 28
24 when they say, "The combined system when implementing *Nguyen's* express
25 disclosure of determining whether loss of lockstep is recoverable in *Bigbee's*
26 firmware, FRC logic, is relative to *Bigbee's* detection of loss of lockstep will

1 be as follows." And then they go to page 29, and that is the two diagrams.
2 It's actually the combined two diagrams, one of the figure 3 and then
3 modified with *Nguyen* inserted into the *Bigbee* flowchart.

4 JUDGE GIANNETTI: But don't you think your argument takes that
5 diagram a little too literally?

6 MR. AUCHTER: I think, Your Honor, that our argument takes the
7 Petitioner's arguments as presented and it says, "As presented," the
8 combination proposed would not achieve those goals. And, therefore, a
9 person of ordinary skill in the art would not have made that combination
10 because it wouldn't give you the ability to distinguish between recoverable
11 and non-recoverable errors.

12 JUDGE GIANNETTI: So it wouldn't achieve what's in the claim. Is
13 that what you're saying?

14 MR. AUCHTER: It wouldn't achieve what's in the claim, and it also
15 would not achieve what was identified as the desirable characteristics that a
16 person of ordinary skill in the art would have been seeking to achieve.

17 JUDGE GIANNETTI: But what do you say about the cases that warn
18 against bodily incorporating references? Doesn't that -- it sounds like a
19 bodily incorporation to me. You've taken this diagram and you've said, oh,
20 well, you know, it's really more complicated than that and the person
21 wouldn't do it because it wouldn't work. I guess that's what you're saying,
22 right?

23 MR. AUCHTER: Well, it's my understanding in those cases, Your
24 Honor, that the person or persons challenging the patent validity was not
25 proposing a specific combination and saying this is how it would be done,
26 but was rather saying you could combine the two references. And then they

1 came back and said, well, you can't combine the two references because they
2 won't work together for one reason or another. Whereas in this case, they
3 have presented us with a very specific combination of the petition, saying
4 that this is the combined system and this is what it would be. And we're
5 saying that your proposed combined system is not one that would work for
6 the reasons that we get into it further.

7 JUDGE GIANNETTI: But what if we were to conclude, what if our
8 Panel were to conclude that that diagram that you're basing your argument
9 on was really more conceptual than you're presenting it. You make it sound
10 like that's a schematic diagram for how the thing is going to go together.
11 But your opponent said it's more conceptual. That's my understanding of her
12 answers to my questions. And what if we were to agree to that? What does
13 that do to your argument?

14 MR. AUCHTER: Your Honor, our argument -- our response to that
15 would be that the Board was going beyond the positions set forth in the
16 petition and looking to hypotheticals and expanding arguments that were not
17 fairly presented to the Patent Owner, and the Patent Owner did not have an
18 opportunity to respond to or within the due process confines of the IPR
19 because we are responding to what was in the petition and not what else
20 could have been done or might have been done.

21 JUDGE GIANNETTI: Well, that was just one diagram in probably
22 over a hundred pages of argument, and you focused on that one diagram.
23 And I'm sure that I'm going to hear from you -- from the other side that there
24 was a lot of other description of these issues other than that one diagram. It
25 seems to me that if we don't agree with you that this one diagram is the sum

1 and substance of their argument and they should be held to it, it seems to me
2 your argument may be in trouble.

3 MR. AUCHTER: Well, respectfully, Your Honor, as you say, the
4 diagram is the combined system, and that was the element of the
5 combination of the two prior art references, *Bigbee* and *Nguyen*, that was
6 encapsulated in that one diagram. If one looks at page 28 of the petition, one
7 sees that they're asserting that all the other elements are found in *Bigbee*.
8 And it is only this one additional limitation that is available in the
9 combination of *Bigbee* and *Nguyen*. And that's why we are focusing on that
10 one. It's not just one diagram. It's the basis for their entire invalidity
11 challenge, with all due respect, Your Honor.

12 JUDGE GIANNETTI: All right. Well, I understand your position.
13 I've taken up enough time on this, but you can go ahead with your argument.
14 We'll hear how this develops.

15 MR. AUCHTER: Thank you, Your Honor. So starting with the issue
16 here, we're looking at the claims. The claims are directed to detection of
17 lockstep, or loss of lockstep, rather, more particularly. And the issue is you
18 have *Bigbee*. *Bigbee* is saying that the FRC logic is looking at the two
19 processors and it's going to detect an error in one of the processors. And
20 then it is going to proceed to determine that there is a loss of lockstep
21 because of the error detected in one of the processors. And then it's going to
22 go ahead and initiate the system by which it takes the processor core out of
23 the loop and research it without having to reset the entire system. And that's,
24 for example, in this figure, in figure 4 from *Bigbee*, where they specifically
25 say the hardware detects an error within a first processor core or a plurality
26 of processor cores. That's how *Bigbee* is operating.

1 That's also consistent with the understanding and the explanation of
2 Dr. Brogioli. So, for example, if you look at Petitioner's slide 36, where
3 they discuss Dr. Brogioli's deposition testimony, Dr. Brogioli says, "So here
4 in block 404, figure 4A of *Bigbee* is where *Bigbee*'s hardware detects an
5 error within the first processor core." *Bigbee* is detecting the error within the
6 first processor. Well, detecting an error within the first processor core is a
7 way of detecting a loss of lockstep. And that's what was set forth in the
8 proposed construction by Petitioners. That's also what's described in the
9 '958 patent, and it's also what's described in *Bigbee*.

10 What *Bigbee* doesn't do is detect an error beyond an error in the
11 processor core because *Bigbee* doesn't do that. And that is why, for
12 example, *Bigbee* doesn't handle recoverable versus non-recoverable errors.
13 *Bigbee* is premised on detecting an error in a first processor or multiple
14 processors and calling that a loss of lockstep error, which is also a precursor.
15 And that was consistent with the proposed definition of construction or
16 could also be consistent with how a person of ordinary skill in the art would
17 understand this term in the claim based on a reading of the specification of
18 the '958 patent. For example, column 4, 56, the paragraph there we say
19 detection -- "a detection of an error by either of error detect logic 13A and
20 13B also provides detection of loss of lockstep in the processors 12A and
21 12B"; and to recognize in the '958 patent and in *Bigbee* that's how you
22 would identify a loss of lockstep.

23 We respectfully submit, Your Honor, that as discussed here in Patent
24 Owner's response and in Patent Owner's sur-reply, Patent Owner asserts that
25 page 12 of Patent Owner's response, as *Bigbee* expressly discloses and
26 Petitioners expert acknowledged, the recovery process begins after *Bigbee*

1 has detected an error within a first processor. *Bigbee* is operating by
2 detecting an error within the first processor, not detecting a mismatch error
3 separate and distinct from detecting an error in the first processor.

4 JUDGE GIANNETTI: Counsel, I don't think this is disputed, is it?

5 MR. AUCHTER: Well, with respect, Your Honor, I think it is
6 slightly disputed because it appears from their slides that Petitioner is
7 arguing that *Bigbee* discloses both detecting a mismatch error without an
8 error in a processor and a mismatch error within a processor.

9 JUDGE GIANNETTI: And, oh, they're -- since you referred to their
10 demonstratives, I'll point you to their demonstrative page 16. I'm sure you
11 have that in front of you.

12 MR. AUCHTER: I do (phonetic).

13 JUDGE GIANNETTI: So you disagree with their analysis on that
14 page where they say error within processor, lockstep recovery, lockstep
15 mismatch error, question mark?

16 MR. AUCHTER: Yes, Your Honor. Because they in -- on page 16
17 actually what they're saying there is basically the only focus was on handling
18 recoverable errors detected in the processors.

19 JUDGE GIANNETTI: But I think that's what you were saying, right?

20 MR. AUCHTER: Right. That's what *Bigbee* does. We do not
21 dispute that point.

22 JUDGE GIANNETTI: Okay. What about the second point?
23 Lockstep mismatch error doesn't -- it's not -- it does not respond? It's not
24 covered?

25 MR. AUCHTER: Lockstep mismatch error, if not caused by a
26 processor error, is not covered in *Bigbee*.

1 JUDGE GIANNETTI: So generally, with that caveat you would
2 agree with this slide?

3 MR. AUCHTER: That says *Bigbee* only focuses on handling
4 recoverable errors detected in the processors? Correct.

5 JUDGE GIANNETTI: All right. Thank you.

6 MR. AUCHTER: And at one point you had asked why doesn't *Bigbee*
7 look at non-recoverable errors? I respectfully submit, Your Honor, the
8 reason *Bigbee* does not look at handling non-recoverable errors is because
9 *Bigbee* does not address those. *Bigbee* does not detect those in the FRC
10 logic of *Bigbee*.

11 JUDGE SZPONDOWSKI: But, Counsel, isn't that the point of
12 Petitioner's combination with the *Nguyen* reference to address the non-
13 recoverable errors?

14 MR. AUCHTER: Your Honor, respectfully, the point that the
15 combination of *Nguyen* does is it provides a way for the fact that the *Bigbee*
16 wouldn't -- would already have said it's a recoverable error, to say, look, let's
17 figure out if it's recoverable or non-recoverable error and then determine the
18 appropriate response for the error if it's recoverable or non-recoverable error.
19 And so, in other words, they are talking about what you do to -- what you do
20 after the loss of lockstep, if you detected the loss of lockstep. But then let's
21 determine if it's recoverable or not.

22 So, as in claim 1, for example, using said firmware to determine if
23 lockstep is recoverable further comprises determining if lockstep mismatch
24 has occurred, things of that nature. And that's what *Nguyen* is providing in
25 the combination that was proposed by Petitioners is the ability to determine

1 if lockstep is recoverable or non-recoverable as required by claim 8, for
2 example.

3 JUDGE GIANNETTI: Is it your -- I'm sorry, is it your contention that
4 *Nguyen* doesn't teach that?

5 MR. AUCHTER: No, Your Honor, it's our contention that *Bigbee*-
6 *Nguyen* combination doesn't teach that. The *Bigbee-Nguyen* combination,
7 *Bigbee* has detected an error and determined it to be a recoverable error
8 because *Bigbee* is focusing on an error in a processor rather than the non-
9 recoverable errors.

10 JUDGE GIANNETTI: Well, *Bigbee*, I think in that chart we were just
11 looking at, I think you agreed that at least in certain circumstances, *Bigbee*
12 does determine if lockstep is recoverable. Is that right?

13 MR. AUCHTER: Well, *Bigbee* always assumes lockstep is
14 recoverable, Your Honor.

15 JUDGE GIANNETTI: Okay.

16 MR. AUCHTER: It detects a loss of lockstep without making the
17 determination whether it's a recoverable or non-recoverable loss of lockstep,
18 and it determines -- it detects a loss of lockstep by getting an error signal
19 from one of the processors. So, as, for example, disclosed in the first
20 element of the claim, you know, flowchart, if you will, of figure 4A.

21 JUDGE GIANNETTI: Well, to get back to Judge Szpondowski's
22 question, doesn't that suggest that there's a need -- that *Bigbee* suggests that
23 there's a need to determine if lockstep is recoverable in that circumstance
24 where there's a mismatch? Doesn't that logically follow from that absence of
25 a teaching in *Bigbee*?

1 MR. AUCHTER: Well, respectfully, Your Honor, *Bigbee* wouldn't
2 teach that. *Bigbee* is just assuming that all errors are recoverable and moves
3 on from there without addressing or detecting non-recoverable errors.

4 JUDGE GIANNETTI: I thought we looked at that slide we were just
5 looking at, and I thought it was only certain errors. That error within a
6 processor is recoverable, but it's silent as to whether a mismatch error is
7 recoverable.

8 MR. AUCHTER: Correct, Your Honor, and that's because *Bigbee* is
9 only looking for an error in a processor causing the loss of lockstep.

10 JUDGE GIANNETTI: And your takeaway from that is that that
11 means that mismatch errors are recoverable?

12 MR. AUCHTER: No, Your Honor. Our takeaway from that is that
13 *Bigbee* is not -- *Bigbee* is detecting mismatch errors solely based on whether
14 or not there was an error within a first processor.

15 JUDGE GIANNETTI: I think in some of the papers that's referred to
16 a precursor. Is that what you would call it?

17 MR. AUCHTER: Yes, that would be a precursor, Your Honor. Yes.

18 JUDGE GIANNETTI: So it's detecting precursors, but it's not
19 actually determining the mismatch.

20 MR. AUCHTER: Correct, Your Honor. And that's why it's not
21 determining whether it's recoverable or non-recoverable. Now, detecting a
22 precursor is identified in the '958 patent and was also proposed as a
23 construction by the Petitioners as being a way of detecting loss of lockstep.
24 And certainly, given that it's described as such in the '958 patent, I wouldn't
25 disagree with that. But if one detects loss of lockstep that way, then one is
26 only going to be detecting the recoverable errors.

1 JUDGE GIANNETTI: But doesn't that suggest that there's a need for
2 determining lockstep errors, not precursors, but actual lockstep errors? And
3 isn't that need met by *Nguyen*?

4 MR. AUCHTER: Well, respectfully, Your Honor, it suggests that
5 there isn't a need because that's what *Bigbee* discloses and teaches, and that
6 it would be with the hindsight benefit of the '958 patent, then one would
7 recognize that there was a need to distinguish between recoverable and non-
8 recoverable errors.

9 JUDGE GIANNETTI: Well, it seems to me that you could -- just to
10 use an analogy, one might say that, you know, medically we screen for
11 various diseases, but that doesn't mean we shouldn't also test for them
12 whether we have them or not. Usually the precursor is a test for something
13 that might cause a mismatch without actually testing for a mismatch.
14 *Nguyen* not only tests for precursors, but also tests for actual mismatches.
15 Why isn't that a logical extension of the teachings of *Bigbee*?

16 MR. AUCHTER: Actually, Your Honor, that was not what was
17 proposed by Petitioners. Petitioners proposed adding *Nguyen*'s step of
18 determining if the lockstep is recoverable after *Bigbee* has already detected a
19 loss of lockstep.

20 JUDGE GIANNETTI: Well, no, it's detected a precursor.

21 MR. AUCHTER: *Bigbee* describes it as having detected a loss of
22 lockstep, I believe. But yes, it is a precursor.

23 JUDGE GIANNETTI: Well, so *Bigbee* detects the precursor and
24 doesn't go to the step of actually testing for the disease. And *Nguyen* goes
25 forward and says not only test for the precursor, but also make sure you

1 don't have a mismatch. Why isn't that a logical extension of *Bigbee*? I'm
2 still puzzled by your argument.

3 MR. AUCHTER: Because Petitioner did not propose modifying the
4 detection of lockstep in *Bigbee* to include the detection of lockstep in
5 *Nguyen*. And they just said let's look at the *Nguyen* determination of
6 lockstep aspects without entering into the detection of lockstep, and said that
7 we've already -- as Dr. Brogioli said in his deposition, and that was in our
8 slide 4, but also the -- his answer is in -- their slide 36, here in block 44,
9 figure 4A of *Bigbee* is where *Bigbee*'s hardware detects an error within a
10 first processor core. And this is the step in which I incorporate the
11 determining if the lockstep is recoverable using the portion from the *Bigbee*
12 -- I'm sorry, I misspoke, Your Honor, the *Nguyen* reference.

13 And then further on in line 16 of his deposition transcript, 16 to 21
14 on page 78, I would say it's on incorporating *Nguyen*'s determination of
15 whether these *Bigbee* errors detected by *Bigbee* are recoverable or non-
16 recoverable, and to properly handle the detected errors and the benefits that
17 come with them. The Petitioners' expert, Dr. Brogioli, and Petitioners in the
18 petition proposed modifying with the determination elements of *Nguyen* and
19 not the detecting elements of *Nguyen*. And that's why it's very critical to
20 focus on the combination that was proposed. And that is why the
21 combination would not work because it's only detecting non-recoverable -- I
22 mean, I'm sorry, Your Honor, recoverable errors.

23 JUDGE GIANNETTI: Well, I would say that's a very nuanced
24 argument. But look at their slide 33. They have the diagram that you've
25 pointed out to us. This is detect loss of lockstep. But look at that dotted line
26 which points up to that table that we were just talking about, which really is

1 a table about precursors. Doesn't that suggest to you when they talk about
2 detecting loss of lockstep, they're talking about the step in *Bigbee* where the
3 error is with the precursor step?

4 MR. AUCHTER: Respectfully, Your Honor, that is reading too much
5 into *Bigbee*. *Bigbee* is detecting the precursor step. Yes, that's exactly what
6 it's doing. But *Bigbee* is not teaching going beyond that to detect errors that
7 would not have been detected by the precursor step by the loss of the
8 processor. And that's what's explicitly disclosed in *Bigbee* where it says that
9 it would (inaudible).

10 JUDGE GIANNETTI: But it is disclosed in *Nguyen*. It is disclosed
11 in *Nguyen*, though, isn't it?

12 MR. AUCHTER: *Nguyen* discloses -- yes, *Nguyen* discloses a
13 different system. *Nguyen* has a combination of the FRC checker and the
14 error logic for the detection of lockstep error and they're two separate
15 systems for it. Whereas *Bigbee* as disclosed has a black box that says FRC
16 logic. And then we are -- then from that FRC logic comes the decisions
17 once the firmware has determined there to reboot, et cetera.

18 JUDGE GIANNETTI: All right, I hear your argument. Unless there
19 are more Panel questions, why don't you continue?

20 MR. AUCHTER: Okay. So if one starts with *Bigbee*, as was done in
21 the petition, the point is that *Bigbee* will not just -- will not identify a non-
22 recoverable error. Again, this goes back to whether or not there's a need to
23 do it in a different way as was recognized certainly by the inventors and the
24 '958 patent or is desirable to do that, you can't do that by a -- distinguish
25 between recoverable and non-recoverable errors starting with the *Bigbee*
26 system because *Bigbee* is detecting recoverable errors. And since *Bigbee* is

1 discovering -- is detecting a recoverable error, when you go into the decision
2 block of *Nguyen* that Dr. Brogioli incorporated in, one would always have a
3 yes response that it was a recoverable lockstep error.

4 This is further emphasized, if you will, in claim 8, because since
5 *Bigbee* is only detecting recoverable errors, *Bigbee* does not disclose or
6 teach or suggest the method of determining that the loss of lockstep would
7 not be recoverable. And it does that because it's only identifying
8 recoverable errors and has no way of determining that the loss of lockstep is
9 not recoverable.

10 Let's move on to the -- another issue that Your Honor addressed was
11 the question of is it firmware versus hardware versus software? And
12 perhaps clarification would assist. What Mr. Jones was opining and
13 testifying to is that a person of ordinary skill in the art would not have
14 implemented the detection steps, the step of doing the bit-by-bit comparison
15 in firmware. So it's a distinction between hardware and firmware.

16 For example, in paragraph 32 of Mr. Jones' declaration he asserts
17 that a person of ordinary skill in the art would recognize that implementing
18 *Nguyen's* FRC checker's compare unit and firmware code would be
19 impractical for several reasons. *Nguyen's* FRC checker compare unit is
20 performing a detection, a hardware comparison, as opposed to the firmware
21 logic, your processor abstraction layer, your system abstraction layer, which
22 subsequently determines how I'm going to deal with this, what I'm going to
23 do with it, interprets the ACPI commands, et cetera.

24 This is just the steps of comparing the bits and determining whether
25 or not there's an error looking at it. And in that case, one sees that consistent
26 with what Mr. Jones asserted in paragraph 32 of his declaration, detecting

1 errors by comparing data from both cores using firmware would require a
2 separate processor running approximately 20 times faster than the processor
3 cores being monitored. This would, of course, add complexity and expense.
4 And that relates to the hardware operations, not the software operations.

5 More specifically, his second point, proving by formal methods that
6 firmware configured to perform bit-by-bit error checking is operating
7 correctly is much more difficult than proving the same for a hardware
8 implementation. Again, that would be because the formal verification of
9 operations of logic gate (phonetic) configured a specific way is fairly
10 straightforward, whereas identifying whether or not the software is
11 implementing the same functions, informal verification of software is much
12 more difficult. And that would be something that a person of ordinary skill
13 in the art would certainly have recognized. And that makes it, of course,
14 more difficult to ensure reliability. And that would be the second argument
15 against using firmware for the detection of loss of lockstep. And that again
16 goes to the hardware versus software versus firmware question that Your
17 Honor posed earlier in this hearing.

18 JUDGE GIANNETTI: Counsel, would you address yourself to how
19 much weight we should give Mr. Jones' testimony on what seems to be a
20 rather fine point of computer architecture?

21 MR. AUCHTER: Well, respectfully, Your Honor, Mr. Jones was
22 actually a person of ordinary skill in the art, if not above ordinary skill in the
23 art, in 2004 because he had his degree in 2003. And the points that he is
24 addressing on the use of embedded software and in terms of developing
25 firmware and using firmware and modifications to assist them are precisely
26 in line with his publications and his relative -- relevant industry experience.

1 So, for example, pointing to the rebreather system, who is
2 responsible for system architecture, hardware design and layout, and
3 embedded firmware. And these are all elements of a microprocessor or an
4 embedded processor that's functioning. Otherwise, you wouldn't have
5 embedded firmware in system architecture. So that was an area where he
6 was directly responsible for issues of computer system architecture.

7 In addition, if one looks at his publications at the relevant time
8 period, and he was publishing extensively on embedded programming
9 techniques. Well, embedded programming techniques are programming of
10 embedded processors in dealing with space limitations, what have you. And
11 that would be directly germane to the issues of whether or not you would use
12 a firmware and whether a person of ordinary skill in the art would recognize
13 that firmware would be inappropriate to implement at least the hardware
14 functions.

15 JUDGE GIANNETTI: What did he cite in support-- what did he cite?
16 Did he have any test results?

17 MR. AUCHTER: No, Your Honor. He cited his experience.

18 JUDGE GIANNETTI: I see, but no test results. Any studies on
19 firmware versus hardware?

20 MR. AUCHTER: No, Your Honor.

21 JUDGE GIANNETTI: All right. You know, I mean, there've been a
22 lot of cases about the interchangeability of software and hardware, and I
23 think the computer scientists would tell you that anything you can do in
24 hardware, you can do in software. So how much weight should we give this
25 argument?

1 MR. AUCHTER: The issue is not whether or not you could do it,
2 Your Honor. In fact, as Mr. Jones said, you can do it. It adds complexity
3 and expense, that the formal verification would be much more difficult, not
4 that it couldn't be done; that the person of ordinary skill in the art, on
5 balance, would look at the additional detrimental effects and determine that
6 they would not be motivated to implement it in firmware because of that as
7 opposed to whether or not it could be done. It does not say that it can't be
8 done, just that it wouldn't be done by a person of ordinary skill in the art for
9 the reasons he set forth. And I don't think there's any dispute that firmware
10 is more vulnerable than hardware to malicious attacks simply because
11 firmware can be rewritten. The very flexibility and the ability to modify it is
12 what makes it vulnerable.

13 JUDGE GIANNETTI: But it's also updatable. It can be changed.
14 Once something is cast in hardware, it's very difficult to update it. Whereas
15 firmware updates, my phones and cameras and other electronic devices, I'm
16 getting firmware updates all the time. Isn't that an advantage of firmware
17 over hardware?

18 MR. AUCHTER: Well, as Mr. Jones states, and I quote from
19 paragraph 33 of his declaration, "I agree with Dr. Brogioli that firmware is
20 more flexible and more easily modified," but I do not agree that those
21 (inaudible) is being viewed as desirable in the context of *Nguyen's* error
22 detection hardware.

23 JUDGE GIANNETTI: So isn't this really a design choice, whether
24 you do it in hardware or software? What's the patentable significance of
25 hardware versus software here?

1 MR. AUCHTER: As Your Honor pointed out, there have been
2 numerous cases discussing that very issue, whether or not hardware to
3 software could or could not be done. And I believe that the significance is,
4 on balance, whether or not a person of ordinary skill in the art would have
5 been motivated to implement these changes in firmware when, respectfully,
6 it appears that neither *Bigbee* nor -- implemented the hardware, the
7 comparison, the detection aspects in firmware, but rather implemented them
8 in hardware. And as an example of that, I went directly to the first line of
9 figure 404 and A where it says when it's hardware detects an error in the
10 processor.

11 JUDGE GIANNETTI: Okay, thank you.

12 MR. AUCHTER: And one other point, Your Honor, if I could. Mr.
13 Jones does not have a degree in computer science, computer architecture, but
14 does have a degree in a related field. And he certainly has had over a decade
15 of work experience at the time. And I would argue that in 1983 his degree
16 would have been the equivalent or related degree to the degrees identified as
17 that which would be held by a person of ordinary skill in the art.

18 And then just going back to the -- another point that, as Mr. Jones
19 identified, he said that you would have to have a separate processor running
20 approximately 20 times faster than the processor being monitored or the
21 processor cores being monitored. And that's because in order to do this
22 detection, you would have to have a real-time operation of hardware as
23 opposed to a software execution of firmware, which is going to be slower
24 than a hardware switching by its very nature.

25 Is there any further questions, Your Honor -- or Honors?

26 JUDGE WHITEHEAD: I don't think there any more questions.

1 MR. AUCHTER: Thank you, Your Honors. At this point that we -- I
2 believe I reserved 10 minutes of rebuttal time, so I yield to Counsel. By the
3 way, Counsel, congratulations on your first argument.

4 JUDGE WHITEHEAD: All right. We are ready when you are. You
5 have 12 minutes reserved for rebuttal.

6 MS. ZHANG: Thank you, Your Honor. We have three responses.

7 First, we'd like to go to Patent Owner's slide number 2. As you see
8 on, Your Honors, the title of this slide is "*Bigbee* does not disclose
9 determining if lockstep is recoverable." And we agree with that. We have --
10 sorry, just one second. I'll present this slide. Okay. I'm now showing slide
11 number 2 of Patent Owner's presentation. Is it shared yet? Okay. Coming
12 up. Can you see the Patent Owner's slides, please?

13 Okay. So, we agree with that. As we have presented in our
14 combination, *Bigbee* does not disclose determining if lockstep is
15 recoverable. It does disclose detecting loss of lockstep. And as Patent
16 Owner does not dispute based on the specification of a '958 patent as
17 proposed in our construction, loss of lockstep includes two types of errors:
18 one is the error -- recoverable error detected in individual processors and the
19 second type is the mismatch error. And *Bigbee* detects both types of errors.

20 Now, Counsel for Patent Owner says *Bigbee* does not detect a error
21 beyond the processor core. And I believe Counsel also said *Bigbee* does not
22 detect mismatch error. And that is incorrect. But may I direct Your Honor
23 to *Bigbee* paragraph 33. It says the FRC logic detects the mismatch error.
24 Then they show you paragraph 33 here.

25 At the bottom of paragraph -- on this page, at the bottom, it says FRC
26 logic monitors processor core stored operations, arrest the share cache to

1 detect, and they move up to the top of this page, inconsistencies in the
2 generated result which indicate an FRC mismatch error. That is to say
3 *Bigbee*, as we have cited in our briefs and by Dr. Brogioli, *Bigbee* detects
4 both types of errors. And as Patent Owner's Counsel correctly noticed that
5 *Bigbee* does not address, going back to our combination, *Bigbee* does not
6 address the mismatch error and that is why we are incorporating *Nguyen's*
7 determination and responding to that non-recoverable error. And that is our
8 combination. Patent Owner's argument totally missed the mismatch error
9 that's detected by *Bigbee* and is ignoring the whole combination of
10 incorporating *Nguyen's* determination.

11 And note again that they are now disputing about the benefits of
12 handling these errors differently as we have described in the background
13 section in the petition -- State of the Art section in the petition. So that is
14 our first response.

15 And our second response is about the framework. Sorry, one note
16 with respect to this, we would like to go back to Patent Owner's slide. If you
17 look at slide number 5, they argued -- when they argued that there's -- you
18 wouldn't combine *Nguyen* because *Nguyen* is necessary. They argue that --
19 they said this step, however, is completely unnecessary because *Bigbee* has
20 already determined if lockstep is recoverable. And that's directly contrary to
21 what they have shown in slide number 2 that says *Bigbee* does not determine
22 if lockstep is recoverable.

23 Patent Owner's arguments are inconsistent between their arguments
24 just finding -- to read *Bigbee*, hopefully, to support their position that *Bigbee*
25 either determines or not determines, that they can decide which way it goes,
26 even if they argue *Bigbee* detects -- assumes lockstep is recoverable. But

1 that's not a determination and we agree that *Bigbee* does not determine
2 recoverability. It does detect the different types of errors. That's the first
3 response we like to make.

4 The second response is about firmware. And I may direct you to
5 slide number 3. Here Patent Owner argued that you wouldn't use *Bigbee*'s
6 firmware for incorporating the determination, but *Bigbee* teaches the FRC
7 logic can be implemented by firmware. And the Patent Owner argued that
8 you wouldn't detect those errors with firmware because of some of the
9 alleged disadvantages. But *Bigbee* teaches the FRC logic that detects the
10 errors in individual processors and detects mismatch errors also can be
11 implemented in firmware. This is a small presentation of that, but it is our --
12 also in our presentation. It shows *Bigbee* discloses FRC logic may be
13 implemented in firmware.

14 And, Your Honor, they're also not arguing and disputing about it's
15 beyond ordinary skill to use firmware. The mere disadvantages, that's not
16 obvious in motivation to combine. And again, we want to emphasize that
17 because *Bigbee* teaches using FRC logic as firmware to detect the errors,
18 those are the functions that's used by *Nguyen*'s determination. We're using
19 *Bigbee*. The combination would use *Bigbee*'s FRC firmware logic --
20 firmware FRC logic to implement the determination -- implement the known
21 functions. There's no need to provide a motivation to implement or add
22 firmware to *Bigbee*.

23 And finally, we would like to go to slide number 13 of Patent
24 Owner's slides. So, Patent Owner didn't mention that Mr. Jones published
25 extensively on embedded programming techniques. But as we have shown
26 in our slides about the agreed upon definition that is a bachelor's degree in

1 computer science, computer engineering, or equivalent, and two years of
2 experience with computer architecture design.

3 Now, that's a study of the designs of different computer systems so
4 that they can work together to make sure the computer works effectively,
5 reliably, and sufficiently -- sorry, efficiently. And that's including hardware,
6 software, and firmware. But here, while agreeing Mr. Jones has extensive
7 experience with programming, just writing firmware code is not experience
8 with computer architecture design.

9 And with that we hope, Your Honors, we have persuaded you that
10 we have met our burden showing you the claims are unpatentable over
11 *Bigbee* and *Nguyen*. Thank you, Your Honors.

12 JUDGE WHITEHEAD: Counselor, thank you. We reserved 10
13 minutes for rebuttal. Counsel, when you're ready.

14 MR. AUCHTER: Thank you, Your Honor. If I could address the
15 three points.

16 First off, Your Honor, I'm recognizing *Bigbee*'s discussion in
17 paragraph 33. Respectfully, *Bigbee* is monitoring the outputs of each of the
18 generated results and detecting the errors and that's how it's detecting an
19 FRC mismatch error. We're not disputing that a mismatch error could be
20 detected by looking at individual processor errors.

21 That's what's taught in the '958 patent as well. What Patent Owner is
22 arguing is that *Bigbee* is not teaching detecting them through a comparison,
23 but rather *Bigbee* is detecting them by looking at processor errors. And
24 that's consistent with *Bigbee*'s detailed description beginning at, for example
25 paragraph 35 of *Bigbee*.

1 And also, *Bigbee* doesn't determine whether it's a recoverable or non-
2 recoverable error because *Bigbee* just doesn't care. *Bigbee* is assuming that
3 the errors its detected are recoverable. It's not making a determination one
4 way or another as to whether it's a recoverable or non-recoverable error,
5 simply determining that there was an error and implementing the recovery
6 approach that *Bigbee* has disclosed, taught, and claimed in *Bigbee*'s patents
7 on that one.

8 With respect to whether or not FRC logic is firmware or hardware,
9 the FRC logic block in *Bigbee* incorporates these steps of both detecting and
10 determining how to proceed on that. And that is shown, for example, on
11 paragraph 35 of *Bigbee* where they say that the illustrative process begins
12 block 402 and thereafter hardware, e.g., FRC logic, detects an error within a
13 first processor. And then FRC logic proceeds to generate various exceptions
14 and things like that.

15 So our position would be that FRC logic, that block that's labeled FRC
16 logic in *Bigbee*, includes hardware and firmware, and that a person of
17 ordinary skill in the art would understand that the firmware was referring to
18 the program abstraction layer, the system control, the system abstraction
19 layer, SAL, and things of that nature.

20 And furthermore, Your Honor, as we said before, the computer
21 architecture design and system architecture design, if one looks at the
22 rebreather system and some of the other systems that Mr. Jones discusses in
23 his resume, what would seem those have computer architecture elements,
24 processor, firmware code, and things of that nature. We would argue that
25 that is analogous to and would be understood as being computer
26 architecture.

1 Thank you, Your Honor.

2 JUDGE WHITEHEAD: Thank you. Panel, is there any more
3 questions you have of counsel? (Inaudible) as a no.

4 Well, thank you for appearing today and for answering our questions.
5 We'd like to especially thank our LEAP practitioner for appearing today.
6 We will take this case under advisement. . Practitioners (phonetic) please
7 stay in case the court reporter has any questions. Court is adjourned and we
8 are off the record.

9 (Whereupon, the proceedings at 2:58 p.m. were concluded.)

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