

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WEATHERFORD U.S., L.P.,
Petitioner,

v.

HALLIBURTON ENERGY SERVICES, INC.,
Patent Owner

IPR2024-00990
Patent 11,333,007 B2

Record of Oral Hearing
Held: October 22, 2025

Before FRANCES L. IPPOLITO, ROBERT L. KINDER, and BRENT M.
DOUGAL, *Administrative Patent Judges*.

IPR2024-00990
Patent 11,333,007 B2

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P R O C E E D I N G S

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JUDGE DOUGAL: Good morning and good afternoon. So thank you for being here today. First of all, we want to acknowledge and appreciate your flexibility in having this hearing, especially as we had to move it to Alexandria. We appreciate you being here. So this is the oral hearing for IPR2024-00990 between Petitioner Weatherford U.S., L.P. and Patent Owner Halliburton Energy Services, Incorporated, concerning U.S. Patent 11,333,007. I am Judge Dougal. With me today are Judges Ippolito and Kinder.

So let's start with appearances. Please make sure to use the microphone as you speak. So beginning with Petitioner, who do we have here today?

MR. WILSON: Thank you, Your Honor. Douglas Wilson of Armond Wilson LLP. With me is my associate, Monica Arnold. And also, we have here with us representatives from Weatherford, James Kurka and Greg Koush.

JUDGE DOUGAL: Okay. Thank you. And who do we have for Patent Owner?

MR. WALTERS: Good afternoon, Your Honor. For Patent Owner, you have Chad Walters of Baker Botts. And with me is my colleague, Jacob McDonald.

JUDGE DOUGAL: All right. Thank you. Just for your information, and also for the judges, I can only see the people who are going to be speaking at the podium. So if there's some issue that a party is trying

1 to draw attention to, to me or to the other judges from the tables, Judge
2 Kinder, you want to take care of that? Because I can't see the tables.

3 JUDGE KINDER: Okay. Will do.

4 JUDGE DOUGAL: All right. Before we begin, I'll go over a few
5 brief administrative matters. As you know, we've reviewed and have the
6 entire record before us. When referring to demonstratives, papers, or
7 exhibits, please do so clearly and explicitly by slide or page number. Please
8 also pause for a few seconds to allow us time to find what you're referring
9 to. This helps in preparation of an accurate transcript of the hearing.

10 Please be aware that members of the public may be listening in to
11 this oral hearing. Each party has 70 minutes of total argument time. Judge
12 Kinder will control your time on the clock there in front of you. But at the
13 same time, it's your responsibility to manage your time. All right. Do we
14 have any questions before we begin?

15 MR. WILSON: One just logistical question is can the other
16 judges, who are not here in person, see what we're displaying on the screen?

17 JUDGE DOUGAL: I have a separate screen that will show me
18 your slides, so yes.

19 MR. WILSON: Okay.

20 JUDGE DOUGAL: Again, we have your slides in front of us as
21 well that we can control. Patent Owner, any questions?

22 MR. WALTERS: No, Your Honor.

23 JUDGE DOUGAL: All right. Thank you. So before we begin,
24 Petitioner, would you like to reserve any time for rebuttal?

25 MR. WILSON: I would like to reserve 20 minutes for rebuttal.

26 JUDGE DOUGAL: And Patent Owner, would you like to reserve

1 some time?

2 MR. WALTERS: Yes, Your Honor. I'd like to reserve 20
3 minutes.

4 JUDGE DOUGAL: Okay. Just a comment or two about this
5 actual hearing. We have a lot of issues to cover today, so please use your
6 time wisely. We're looking forward to hearing your arguments to hopefully
7 get some clarity on some of these issues. We really have some questions
8 about -- we believe this -- there's some difficult issues in this case. And
9 obviously, with the revised Motion to Amend, there are a lot of issues.

10 I once had a judge tell me that he felt like about 10 percent of
11 hearings were valuable. I feel like this case might be in one of those 10
12 percent where we might get some good clarity from your arguments today.
13 So we look forward to what you have to say.

14 And Petitioner, whenever you're ready, you may begin.

15 MR. WILSON: Let's jump to Slide 8. Thank you, Your Honors.
16 And echoing what Your Honor, Judge Dougal, said, I would like to ask
17 -- I've got a lot of material in these slides, and I can cover a lot of ground or
18 -- and what I would prefer to do is to focus on the difficult issues or what the
19 Board views as a difficult issue. So if you have questions up front, I'm
20 happy to jump directly to what you feel like are the difficult issues. If not, I
21 can start right here at Claim 1 because I think Claim 1 has a lot of breadth.
22 But I'm happy to jump to wherever the Board feels like something needs to
23 be addressed.

24 JUDGE DOUGAL: I mean, Claim 1 has some difficult issues that
25 we've -- I'd like to hear your thoughts on for sure, you know. So as is
26 common, we see Petitioner is maybe arguing over here, Patent Owner is

1 arguing over here, and Yeh's disclosure is somewhere in the middle. I'd like
2 to hear maybe your thoughts on a little more clearly as to how we get
3 directly from Yeh to two segments with different thicknesses.

4 I understand your arguments about how it's known by those of skill
5 in the art that one would understand that the pressure rating of a pipe is
6 dependent on things like materials, wall thickness. But I'm not sure how we
7 go from that to necessarily saying that one skilled in the art would change
8 the wall thickness of one section versus another section.

9 Patent Owner has some evidence that at least the rectangular
10 transfer tubes were thicker, even though those were downstream, the
11 opposite of what the claim requires. I don't know if you have evidence of
12 the opposite, which is what the claim requires. So yeah, we've got lots of
13 questions that -- in that area that we'd like to hear your thoughts on.

14 MR. WILSON: Sure. I'm happy to start right there. So Claim
15 1[e], as Your Honor just indicated, essentially requires a first sand screen
16 assembly that is an upstream or heel -- closer to the heel sand screen
17 assembly that has a higher-pressure rating or -- actually, in Claim 1[e], it's a
18 thicker tubing wall than a downstream sand screen. So it's pretty simple,
19 you just got to have a thicker tubing wall upstream than you do downstream.

20 And what Yeh discloses, as we can see at the top, and what we
21 relied on in our petition is Yeh's disclosure that -- we understand when we
22 are gravel packing a long horizontal interval, we need a very high pressure at
23 the heel. And in fact, Yeh suggests 6,500 psi differential pressure is
24 expected near the heel when gravel packing a 5,000-foot horizontal
25 completion interval. And Yeh goes on to say, in order to maintain the
26 mechanical integrity that is to stay within the burst pressure rating, within

1 the burst bending and collapse ratings of the secondary flow pass, a certain
2 surrounding wall thickness is required.

3 So we can stop right there and say Yeh tells us at the heel, we need
4 a very high pressure, we need it up to 6,500 psi at the heel, and you need a
5 certain surrounding wall thickness to contain that pressure. So Yeh is telling
6 us, how do you get to that high-burst pressure? Wall thickness. Wall
7 thickness is what you use to achieve that high-burst pressure. So we don't
8 need that wall thickness at the toe where we have a low pressure, we need it
9 at the heel where we have a high pressure. So that's Yeh's explicit teaching.

10 Even if it weren't -- let's go to Slide 9. So looking at Slide 9, even
11 if it weren't, this is equation 14 from API Report 5C3. API is the American
12 Petroleum Institute. This is an industry publication that teaches persons of
13 ordinary skill in the art how to calculate burst pressure. And it tells us, you
14 can see, PiR on the left is burst pressure.

15 On the right, we have a number of correction factors. But then we
16 have the three variables that determine it, one is minimum tensile strength,
17 that's in green; in blue, we have tubing wall thickness; and in purple, we
18 have specified pipe outside diameter. So there are three variables, three
19 handles you can turn when you need a certain burst pressure, okay?

20 JUDGE DOUGAL: Counsel?

21 MR. WILSON: Sure.

22 JUDGE DOUGAL: Can you briefly explain -- so in this Petition, I
23 know this is referred to. But, you know, as I went and looked at the exhibit
24 in more detail, is this equation -- can you give me a little context from this
25 equation and what -- and this paper, what this is referring to? Like, is this
26 referring to transport tubes? Is this referring to the oil tube? Is this referring

1 to any tubes, any pipe used in, you know, wells? Can you just give me a
2 little more background of how this applies to the situation?

3 MR. WILSON: This is referring to any tubing or pipe. This is
4 how you calculate the burst pressure of a round tube. This is specific to
5 round tubes. But other than that, it governs every type of tubing, every type
6 of round tubing, pipe, casing, you name it, this is how you calculate the burst
7 pressure.

8 JUDGE DOUGAL: Okay

9 MR. WILSON: It's equation 14.

10 JUDGE DOUGAL: Okay. So this is limited to identifying the
11 considerations for the burst pressure of a tube. It's not necessarily taking
12 into consideration, you know, constraints of your bore versus the size of
13 your oil tube versus your transport and packing tubes. It's totally limited to
14 discussing your primary considerations when you determine the burst
15 pressure of a pipe.

16 MR. WILSON: That's correct, Your Honor.

17 JUDGE DOUGAL: Okay. Thank you.

18 MR. WILSON: Just like the claims at issue, Claim 1 at issue,
19 which doesn't take into account all the other considerations in the well, it just
20 says got a greater tubing wall thickness at the heel than I do at the toe. This
21 equation does exactly the same thing. It says, you need a higher burst
22 pressure, you can turn one of three things, one of three variables will get you
23 there; or all three if you want to turn all three. So to achieve --

24 JUDGE DOUGAL: Sorry, one more question.

25 MR. WILSON: Oh, sure.

26 JUDGE DOUGAL: Sorry. So one thing that's also sometimes

1 difficult to follow in this case is some references you're relying on because, I
2 believe, they're incorporated by reference into Yeh. And others, I assume,
3 are more based on what one skilled in the art would understand. Is this
4 equation one of those references that is incorporated by reference into Yeh
5 or another reference that it relied on, or is this more background knowledge
6 that one in skill in the art would have?

7 MR. WILSON: This is background knowledge that a person of
8 ordinary skill in the art would have. It is a published equation that is used in
9 the industry to calculate burst pressure of round tubes.

10 JUDGE DOUGAL: Okay.

11 MR. WILSON: So a person of ordinary skill in the art would
12 know that this is reliable. It's published by the American Petroleum
13 Institute. They would know that this is the equation that is used to calculate
14 burst pressure. And let me add to that, we cited this in our petition as Your
15 Honor just acknowledged, you will search in vain through Halliburton's
16 briefing, expert declarations for any mention or reference to this equation.
17 They do not address it at all.

18 Because once you accept that this equation is part of the person of
19 ordinary skill in the art's knowledge, obviousness of tubing wall thicknesses
20 is apparent. It's a given. Turning any one of these three things to achieve a
21 higher burst pressure is obvious as a matter of law. It has to be. Because we
22 know that Yeh teaches a higher burst pressure at the heel than at the toe.
23 How do I get there? Turn any one of these three things or are all three, that
24 has to at least be obvious. Can we jump to Slide 14?

25 JUDGE KINDER: Mr. Wilson, this is Judge Kinder. Could I ask
26 a quick question?

1 MR. WILSON: Sure.

2 JUDGE KINDER: About Yeh's main disclosure I think that you're
3 relying on, you know, Patent Owner's, one of their arguments is that here
4 we're simply referring to the wall thickness of the crossover joints. And Yeh
5 is thus limiting the crossover joint diameter or identifying that as a problem.
6 Could you talk to us a little bit about the language specifically in order to
7 maintain the mechanical integrity of the secondary flow paths, the wall -- a
8 certain wall thickness is required?

9 MR. WILSON: Sure.

10 JUDGE KINDER: Is that just referring to the crossover joint?
11 And what would be the secondary flow path, I guess, is the first question.

12 MR. WILSON: Sure, Your Honor. I'm looking for -- I'm going to
13 jump to a slide that addresses this specifically. So Monica, can you jump to
14 Slide 19?

15 So I want to look at Slide 19, because this addresses your question
16 directly. This is Dr. Durham, this is Patent Owner Halliburton's expert, and
17 this is his deposition testimony when we asked him these questions. You
18 can see on the upper left, he's asked, "Yeh teaches that a certain mechanical
19 integrity is needed to stay within the burst, bending, and collapse ratings of
20 secondary flow paths, which required a certain surrounding wall thickness,
21 correct?" He says yes.

22 He's asked, "A person of ordinary skill in the art understood that
23 the mechanical integrity, including wall thickness Yeh described needing
24 was needed in both the sand screen and crossover joint secondary flow
25 paths, correct?" He says, "Not the same considerations. But in general,
26 there needs to be mechanical integrity of both."

1 On the right of this slide, you can see his testimony, "And a person
2 of ordinary skill in the art understood that the same mechanical integrity is
3 needed to contain that pressure in the secondary flow path, shunt tubes,
4 correct?"

5 "A similar consideration, yes. Maybe not the exact same. But
6 mechanical integrity does have to be maintained." Dr. Durham admits that a
7 person of ordinary skill in the art reading Yeh understood that you must
8 maintain mechanical integrity, including the burst pressure limit, in all of the
9 secondary flow paths, not just the crossover joint, and that includes the shunt
10 tube.

11 It's undisputed, Yeh taught a person of ordinary skill in the art, you
12 need to maintain mechanical integrity in the sand screen shunt tubes. But
13 again, even if it hadn't, equation 14 tells you that you -- when I need a higher
14 burst pressure at the heel that I need at the toe, there are only three handles
15 to turn.

16 And so I want to jump back very quickly to -- let's jump back to
17 Slide 16. Slide 16, this is KSR. KSR tells us one of the ways in which a
18 patent subject matter can be proved obvious is by noting that there existed at
19 the time of invention a known problem for which there was an obvious
20 solution encompassed by the patent's claims. Higher burst pressure at the
21 heel versus at the toe is a known problem.

22 There's no dispute that Yeh discloses that. And we can walk
23 through Patent Owner's admissions in that regard. There's no dispute that
24 Yeh discloses that as a solution to a long interval.

25 So what then are obvious solutions encompassed by the patent's
26 claims? Equation 14 tells you there are only three solutions to that problem:

1 tubing wall thickness; tubing tensile strength, which is Claim 21 by the way;
2 and pipe outside diameter. There are only three. They are all obvious
3 solutions to that problem. It cannot be patentable.

4 If we take a look -- I'm going to jump to Slide 17 here on the left.
5 You can see Patent Owner's response where they say Yeh solved that
6 problem with a concentric screen rated to a higher pressure rather than by
7 reducing friction pressure loss, as in eccentric screens, or modifying shunt
8 tubes wall thickness. They tell you right there, Yeh acknowledged the
9 problem. Yeh understood the problem. Yeh disclosed the same problem as
10 the '007 Patent, higher burst pressure at the heel, low burst pressure at the
11 toe. How is it not obvious to use one of the three variables that equation 14
12 tells us we can use?

13 You even see on the right there Dr. Durham helpfully admitting
14 that the patent was allowed based on the assertion that no prior art disclosed
15 doing something different upstream versus downstream in a set of sand
16 screens. But if you look at line 9 there, "But Yeh does teach changing
17 characteristics of the shunt tube assemblies along the length of a production
18 zone, correct?" Yes, Yeh teaches high burst pressure at the heel, low burst
19 pressure at the toe, manipulating any of those three variables to get there has
20 to be obvious.

21 It's a known problem and a known solution. Not just an obvious
22 solution, we have an equation that tells us exactly, precisely how to calculate
23 it. So it's not even a likelihood of success, it's a certainty. The equation tells
24 us we can get there. Now --

25 JUDGE DOUGAL: So Counsel, here's where I struggle with that.
26 In, you know, kind of my initial reading, that seems to make sense, right?

1 But then I look into the actual details, and I see, well, Yeh, in Figure 4, has
2 the system with six transport tubes, and then it goes down to a system with
3 two transport tubes. If we were doing one transport tube to one transport
4 tube, this argument clearly makes sense, right?

5 If this was just burst pressure and there weren't other
6 considerations, or there weren't -- this wasn't a multipiece system with -- if
7 you make this thing bigger, this other thing has to be smaller. It seems like
8 there's a lot of moving pieces here that this analysis kind of ignores. And
9 that's what I'm struggling with, you know, is it okay to ignore -- kind of
10 ignore the other pieces? Is it a simple just one-to-one consideration because
11 of the breadth of the claims? Help me get there.

12 MR. WILSON: Okay. Sure. I'm going to jump to Slide 22 which
13 is highlighting Halliburton's argument in precisely that regard. Yeh and
14 Yeh² taught away, they use concentric screens with thinner walls upstream.
15 So let's talk about that.

16 So now I'm looking at Slide 23. But before we jump into Slide 23,
17 I want to preface this by saying in our petition, we focused on the fact that
18 Yeh teaches a concentric screen, a high-pressure screen upstream of a low-
19 pressure screen. And it teaches you use tubing wall thickness to get there.
20 That's right in column 28. We just saw where Dr. Durham admits that a
21 person of ordinary skill in the art understood that applies to sand screen,
22 shunt tubes, as well as the crossover joint. So we're there, we got a known
23 problem, we got a known solution. Yeh discloses the solution, okay?

24 Now, what Halliburton has done is come back and said, wait, wait,
25 wait, if we pick out a specific example, if we pick out a nine-tube concentric
26 screen and we pick out a two-by-two eccentric screen with rectangular tubes

1 in which one particular prior art reference, not Yeh, discloses the thickness
2 of that particular example of two-by-two rectangular tubes, then in that
3 scenario the upstream tubing wall thickness would be less, and so you can't
4 have obviousness.

5 Now, refuting only a single example from Yeh does not address
6 obviousness based on Yeh. They must take Yeh for all that it teaches a
7 person of ordinary skill in the art, the entire disclosure, not just the part they
8 like, which is why in Slide 23 we came back and said, you can't say that
9 because Yeh discloses all sorts of examples. Yeh says an eccentric screen
10 can have two or more tubes, a concentric screen can have two or more tubes.
11 They can have exactly the same number of tubes.

12 And in fact, as Dr. Durham admits those points on the right,
13 turning to Slide 23 -- or sorry, Slide 24, we even said in our petition, Yeh
14 discloses an eccentric screen with round tubes. What about that example?
15 They don't say anything about that example. What is the relative thickness
16 of those tubes versus the concentric screen in the particular nine-tube
17 example? We don't know because Yeh doesn't disclose it.

18 What we do know is that Yeh tells us to contain a higher burst
19 pressure, you need tubing wall thickness. Equation 14 tells us to contain a
20 higher burst pressure you need tubing wall thickness. Manipulating tubing
21 wall thickness to accomplish that cannot be patentable.

22 I mean, essentially, they're asking the Board to say, yes, it's -- we
23 can patent Equation 14. That's not the law. And Dr. Durham, again, admits
24 here on the right that Yeh discloses eccentric screens with round tubes. This
25 figure was put in our petition. They didn't address it at all because they don't
26 have the relative thicknesses. What we know is the art teaches us that to

1 contain a higher burst pressure, you need greater tubing wall thickness.

2 JUDGE DOUGAL: Just to clarify a couple issues. So one, you're
3 not limiting yourself to rectangular or circular. You cited both in your
4 petition. And so you -- so we're not limited to the -- or to the geometry of
5 the transport tubes, correct?

6 MR. WILSON: That's correct, Your Honor.

7 JUDGE DOUGAL: And then secondly, Patent Owner argued that
8 this two or more shunt tube is a new argument that wasn't in your petition.
9 Did you ever refer to this in the petition, or do you feel like this is just
10 responsive to the arguments?

11 MR. WILSON: So we did not refer to two or more shunt tubes in
12 a concentric screen and in an eccentric screen in our petition. We did not
13 refer to that. And let me back up and explain why. The reason we didn't is
14 because as I've articulated a few times already, the -- our argument was
15 based on Yeh's explicit teaching to use tubing wall thickness to accomplish a
16 higher burst pressure and in equation 14, those expressed teachings in the
17 art, it was known to use tubing wall thickness to accomplish a higher burst
18 pressure.

19 Halliburton then comes back and says, yes, but in this very narrow
20 example of a nine-tube concentric screen and a two-by-two rectangular tube
21 eccentric screen that has a tubing wall thickness as specified in some other
22 prior art reference, it wouldn't be thicker upstream.

23 Okay. But that doesn't mean it wouldn't ever be thicker upstream
24 or that Yeh doesn't teach that it would be thicker upstream, which is -- has to
25 be their argument. I mean, their argument is we can give you an example
26 where the tubing wall thickness is not thicker upstream, even though you

1 have a higher pressure. And therefore, Yeh doesn't teach that.

2 That's not the law. They have to take the reference for all it
3 teaches. And so if we're going to dive into specific examples, well, here's
4 another example, and by the way, what we cited in our petition is Figure 4a
5 and 4b, a concentric screen. This passage in column 16 is describing the
6 exact same embodiment. And in fact, it says right before this passage that
7 you see on the left saying you can have two tubes in concentric or eccentric
8 screens, it says this screen, this concentric screen in Figures 4a and 4b,
9 which we just used as an example, it can be eccentric if you want, but either
10 way, can have two or more tubes, right?

11 That's what it says here in column 16. We're citing the exact same
12 embodiment we relied on in the petition and we're making the exact same
13 arguments. This simply refutes Halliburton's argument that in a specific
14 case, the upstream tube wouldn't be greater.

15 The question is, do we have a known problem and an obvious
16 solution? We do. The fact that in some specific circumstance that might
17 -- you might not need a higher tubing wall thickness upstream, doesn't take
18 away from the fact that manipulating tubing wall thickness to address the
19 problem of a higher burst pressure is a known solution to a known problem.
20 As KSR tells us, that equates to obviousness.

21 So I'm happy to keep going on that, or we can jump to another
22 issue. So what I'd like to do is jump to Claims 2 and 4 very quickly.
23 Because I think Claims 2 and 4 will address also Claim 24 and the revised
24 Motion to Amend. And Claims 2 and 4, just very quickly, require
25 essentially changing between the upstream sand screen and downstream
26 sand screen, either the cross-sectional area of the nozzles or the number of

1 nozzles, one of those two.

2 Can we jump to Slide 11? Okay. So referring to Slide 11, we have
3 here from Yeh2, Figure 15, which shows the pressure profile in blue along a
4 5,000-foot horizontal well. And you can see that the pressure drops almost
5 linearly, not quite linearly as you go down from heel to toe. As that pressure
6 drops, you lose your driving force, right? So slurry flow becomes a
7 problem.

8 Now, what Hurst teaches is that for a given fluid composition -
9 sorry, I'm on Slide 12 -- and gravel concentration friction, and that's the
10 pressure applied to each zone, can be controlled through the shunt tube
11 dimensions, diameter, and length, as well as the nozzle diameter and
12 frequency. It tells you right there, there's a teaching in the art, you need to
13 adjust slurry flow, you can adjust nozzle diameter or frequency, either one.

14 Can we jump to Slide 35? Now, Slide 35 is where we start
15 addressing Halliburton's counter arguments on this point. And they argue
16 that Yeh and Yeh2 two did not teach to modify nozzle parameters to address
17 declining slurry flow rate, but they did teach declining slurry flow rate was a
18 problem. You can see it right here in Figure 6a at the top, from one screen
19 to the next, slurry flow drops. And even within the -- a single packing tube,
20 as shown in Figure 7, their slurry flow drops as you get toward the end.
21 There's a problem.

22 And Patent Owner admits it here because they say in the Patent
23 Owner response -- they say right there in the Patent Owner's response, Yeh2
24 Figure 7 teaches a person of ordinary skill in the art to address declining
25 flow along a packing tube by using a closed-end tube, not by increasing
26 nozzle size. But that's an acknowledgement that we have a known problem.

1 Declining slurry flow rate is a known problem. And so the question then
2 becomes, under KSR, is it obvious to change nozzle diameter or nozzle
3 frequency? It's that simple. If it is, as Hurst teaches us, then it's obvious.
4 It's not patentable. We just saw, as you can see on Slide 37, that's what
5 Hurst teaches.

6 Jump to Slide 38, you don't have to take our word for it. Their
7 own expert said the same thing. Here on Slide 38, you can see Dr. Durham
8 is asked, "A person of ordinary skill in the art, in 2018, understood from
9 Hurst that slurry flow out of nozzles can be controlled by modifying shunt
10 tube, nozzle diameter, correct?" "Among other things, yes, sir." Next
11 question asks about nozzle frequency. "Yes, among other things." A person
12 of ordinary skill in the art knew this was a handle to turn. If they knew it
13 was a handle to turn, we have a known problem, an obvious solution that
14 falls within the claims, the claims are obvious.

15 Now, I want to jump to Claim 5. And let me add before I jump off
16 of Claims 2 and 4 very quickly, we also argue that Claims 2 and 4 are
17 routine optimization, adjusting nozzle frequency or nozzle size is changing a
18 physical parameter, a size of something, if you will, a proportion without
19 any change in substance or effect, okay?

20 The Supreme Court, *Smith v Nichols* says, a change of form,
21 proportions, or degree will not sustain a patent. Changing ratios of one to
22 the other without any unexpected result or surprising result is not patentable.

23 Okay. I want to jump back to Slide 5 -- or sorry Slide 13, Claim 5.
24 Okay. So we argued the same thing for Claim 5. Claim 5 requires that the
25 cross-sectional flow areas of the passageway in the first and second transport
26 tubes is the same. Again, it's a proportion. Proportions are not patentable,

1 absent some surprising result -- unexpected result. Under Smith v Nichols,
2 this is routine optimization, it is not patentable.

3 Okay. Let's jump to the Slide 39. Now, Halliburton says, once
4 again, if we look at a specific example of this nine-tube configuration versus
5 a two-by-two eccentric screen, they -- you don't have the same cross-
6 sectional area. That does not address whether this is routine optimization,
7 whether or not changes in proportion without a change in substance or effect
8 are patentable. They're not. Smith v Nichols Supreme Court case, they're
9 not patentable.

10 Okay. But let's just push aside that argument to which they have
11 no response. Okay. Again, we have the fact that they must deal with the
12 entirety of Yeh's disclosure, not just the one example they want to cite. Yeh
13 says you can have two tubes in a concentric screen. You can have two tubes
14 in an eccentric screen. And by the way, the tubes in the eccentric screen can
15 be round. This is Dr. Durham admitting all of that. That's Yeh's disclosure
16 that they have to contend with, the entirety of the prior art, not just the points
17 they want to deal with.

18 Okay. Now, any questions at this point? If not, I'm going to jump
19 to the revised Motion to Amend. Okay. Let's jump to Slide 58. Now, I
20 think the single, biggest overarching issue in the revised Motion to Amend is
21 Bonner and whether Bonner discloses a high-pressure screen.

22 So on Slide 59, you can see Claim 28[b] simply requires that the
23 first and second sand screen assemblies be eccentric. So now, instead of
24 having just any screen upstream and any screen downstream, we have to
25 have eccentric high-pressure screen and eccentric low-pressure screen.

26 Now, let me start by pointing out that our argument in response to

1 this claim and why this would have been obvious is you have two types of
2 screens. I mean, you've seen this over and over at this point, there's
3 concentric screens and there are eccentric screens. It would have been
4 obvious to try an eccentric screen as a high-pressure screen.

5 You have two identified predictable alternatives. We have a
6 known problem, I need a high-pressure screen at the heel, trying an eccentric
7 screen would have been obvious. And Halliburton does not respond to that
8 argument at all. So we can stop right there, we can agree that Claims 28
9 through 40 are not patentable on that basis alone.

10 But let's dig a little deeper and let's dig in based on Bonner. Okay.
11 Slide 60, we can see that Bonner discloses the overall testing substantiated
12 the goal rating of 5,000-psi burst pressure. Bonner had a 5,000-psi burst
13 pressure.

14 Now, we will talk about the next sentence, which refers to a 1.33
15 safety factor. Momentarily, let's just assume, for the purposes of these next
16 few slides, that Bonner actually meant what it said when it says it has a goal
17 rating of 5,000-psi burst pressure. In that scenario, it -- Bonner's screen can
18 be used to cover a portion of the high-pressure window that's shown for here
19 -- for example here in Slide 61 in Yeh2. It covers more than a 3,000-psi
20 screen. There's no question about that.

21 So for somewhere between 3,000 psi and the 5,300 or 6,500,
22 depending on whether you believe Yeh2 or Yeh. As far as the pressure
23 requirement of getting that full 5,000 feet, you can get something in
24 between. Okay. So it would have been obvious to use Bonner's screen for
25 this application.

26 Now, looking at Slide 62 we see that both Yeh and Yeh2 actually

1 teach us that you need burst strength to cover that high pressure. So this is
2 Yeh, again, saying got to have mechanical integrity. Yeh2 says burst
3 strength of shunt tubes must be capable of accommodating this high
4 hydraulic pressure. Once again, we have two teachings here, the known
5 problem, high-pressure screen at the heel versus a low-pressure screen at the
6 toe.

7 How do we get there? Yeh teaches tubing wall thickness, right?
8 It's right there. Yeh says, need to maintain mechanical integrity of certain
9 tubing wall thickness is required. So it would have been obvious to modify
10 Bonner's screen to increase its pressure rating to meet the demands of either
11 Yeh or Yeh2, 6,500 or 5,300, whichever one you choose.

12 So what does Halliburton say in response? On Slide 63, Bonner
13 did not disclose a high-pressure screen. So this is the discussion of safety
14 factor. But first, let's stop at Slide 64. In Uber Technologies says using one
15 of two identified, predictable solutions is obvious because it would have
16 been a predictable variation using a technique that was known to one of skill
17 in -- ordinary skill in the art. That's exactly what we have here. We've got
18 using an eccentric screen when it's only one of two choices that cannot be
19 patentable.

20 But now, let's talk about safety factor. So on Slide 65, we have a
21 comparison of Mr. Chambers' testimony versus Dr. Durham's testimony
22 from his first deposition before he needed -- he knew that he needed safety
23 factor to save his case. So let's look at what Mr. Chambers says on the left.
24 He's asked, "Is implementing a safety factor common when rating the
25 pressure characteristics of a shunt tube system?"

26 He says, "You know, every operator treats safety factor different.

1 You know, every company uses a different safety factor at Mobil. Way
2 back, we didn't even use safety factors. We had a system based on
3 probability of failure, where we had went out and measured actual tubulars.
4 So the industry does not agree on that. I would say safety factors."

5 Now, you're going to see Dr. Durham agrees with Mr. Chambers.
6 On the right, he's asked, "How is then mathematically pressure rating related
7 to burst pressure? It's less than. Is it some factor? I don't know that there's
8 any standard of factors for this type of design. I'm not familiar with an API
9 standard that would give a particular number."

10 "Do you know what a typical safety factor would be?" "I believe
11 one of the reference discusses some safety factors. But I think these
12 particular designs, the safety factor probably varies from design to design,
13 manufacturer to manufacturer." So before Dr. Durham understood that he
14 needed to modify his testimony to save Halliburton's case, he agreed with
15 Mr. Chambers.

16 And it gets worse. Slide 66, he's asked, "A person of ordinary skill
17 in the art in the 2018 would also understand from Bonner's disclosures that a
18 rectangular shunt tube system could be fabricated to tolerate pressures of at
19 least 5,000 psi, which was more than the 3,000 psi expected of conventional
20 sand screens, correct?" "I agree with that." That is Halliburton's own expert
21 saying Bonner discloses a 5,000-psi system versus a 3,000-psi system, a
22 conventional screen. No agreement in the industry on safety factors.

23 And turning to Slide 67, Halliburton argues that Bonner didn't
24 touch its shunt tube system. It wasn't trying to achieve any higher pressure
25 than a conventional eccentric screen.

26 Now, let me start by saying Bonner is published in 2014, three

1 years after Yeh was filed. Bonner cannot be a conventional eccentric screen
2 that Yeh was referring to. And Bonner, by the way, is a Halliburton paper.
3 Halliburton in 2014 thought it did something worthy of publishing it in an
4 SPE paper. To say it wasn't trying to improve a conventional eccentric
5 screen is a bit ridiculous. If we look at what Bonner actually says, it says at
6 the top, this paper discusses an improved version of the traditional shunt
7 tube system to enhance sand screens for gravel packing and long production
8 intervals. So they are trying to improve their sand screens for long
9 production intervals.

10 If we look at the bottom paragraph, we can see under reliability,
11 Bonner says this phenomenon leads to uneven seal squeeze and is thought to
12 cause more leaks. Consequently, it was decided early in the development of
13 the new shunt tube system that round tubes would be used at the jumper
14 tubes to connect these -- the tube system across joint connections.

15 Bonner has leaks. What are leaks? Loss of pressure containment.
16 Bonner is trying to improve the pressure containment of its system. The
17 issue was the shunt tubes were not the limiting factor; what was, were the
18 jumper tubes. So Bonner achieved its 5,000-psi rating by improving the
19 jumper tubes of conventional eccentric screens.

20 And in fact, you'll notice that in the '007 Patent, they actually refer
21 to the preferable use of round jumper tubes to hold that pressure. So Bonner
22 did improve its pressure rating.

23 Now, if we turn to Slide 68 --

24 JUDGE DOUGAL: Sorry, remind me real quick how jumper
25 tubes interact with the other -- with the packing tubes and the --

26 MR. WILSON: So when you have a joint of sand screen and

1 connected to another joint of sand screen between -- so there are two flow
2 paths. There's a base pipe, primary bore, and then there are secondary flow
3 paths, the shunt tubes. So the primary bores may screw directly together, so
4 they are connected. But now, we've got these shunt tubes out here that have
5 to be connected.

6 So you add a jumper tube that connects to one shunt tube and
7 another shunt tube on the on the other joint so that you have maintained flow
8 from one shunt tube system to the one in the next sand screen if that makes
9 sense. If not, I can show you the Figure 3 in the '007 Patent, it lays it out
10 very clearly.

11 JUDGE DOUGAL: That's fine.

12 MR. WILSON: Okay. So I want to jump to Slide 68 because this
13 is their next argument. They argue, well, the '476 Patent and Barry both
14 disclose a safety factor of at least 1.5, maybe even higher than that. But
15 we're going to see that the '476 Patent and Barry do not disclose a safety
16 factor at all.

17 These two passages are almost verbatim. So I'll focus on the '476
18 Patent at the top. It says, the test revealed that at four barrels per minute,
19 6,000 psi would be required to pump through the entire 5,000 feet of shunt
20 tubes. Therefore, the pressure integrity of the shunt system must be rated
21 higher than 6,000 psi.

22 So let's break that down. We need an operating pressure of 6,000
23 psi to heel to pump four barrels per minute. How high do we need to rate
24 the shunt tube system to accommodate that 6,000 psi operating pressure?
25 The highlighted passage says the shunt system must be rated higher than
26 6,000 psi. That's it, zero safety factor.

1 Does it need to be 6,050? Does it need to be 6,100? Does it need
2 to be 7,000, 8,000? It doesn't say. It just says higher than 6,000, no safety
3 factor.

4 Now, let's look at the next sentence. It says individual shunt tubes
5 welded to an end ring were designed and pressure tested to 10,000 psi, and
6 that's where Halliburton gets its massive safety factor.

7 But let's look at what the language actually says. Notice in the
8 highlighted passage, it refers to the shunt system must be rated higher than
9 6,000 psi. Yet the next sentence says individual shunt tubes were tested to
10 10,000 psi, not the shunt system. What they were doing is saying we don't
11 want the shunt tubes to be the limiting factor in this system, so we're going
12 to test the shunt tubes to 10,000 psi. They didn't test the system to 10,000
13 psi. The shunt system must be rated higher than 6,000 psi. That's it. That's
14 their only requirement. There is no safety factor disclosed in this passage.

15 Okay. Now, turning to Slide 69, Halliburton argues that Yeh,
16 Yeh2, and Bonner did not teach thickening shunt tube walls but taught away
17 from it. We've already talked about that at length, I think. Yeh did disclose
18 using tubing wall thickness to contain pressure, equation 14 did as well.
19 Known problem, obvious solution, that's obvious. The third argument
20 replacing Yeh's concentric screen and crossover tool with Bonner's eccentric
21 screen ignored Yeh's fundamental principle of operation. So let's talk about
22 that very quickly.

23 So I'm going to look at Slide 72. And actually, let's just skip Slide
24 72 and let me just talk about it. Let's go to Slide 73. As we know from
25 KSR, a person -- one of skill in the art is not an automaton but is a person of
26 ordinary creativity, who, in many cases, will be able to fit the teachings of

1 multiple patents together like pieces of a puzzle.

2 Let's talk about what Yeh taught. We've --

3 JUDGE DOUGAL: Can I ask a more fundamental question?

4 MR. WILSON: Sure.

5 JUDGE DOUGAL: Do we have any case law that has dealt with
6 this head on, this kind of conflict, if you will, between KSR and this line of
7 teachings about inoperable for its intended purpose. Or if you take out the
8 main function of the reference, is it no longer a valid reference? Is there any
9 cases that we can rely on or that we can talk about that give us guidance on
10 how to deal with this situation, where in Patent Owner's argument you're in
11 essence removing the invention from the reference and relying on
12 background teachings or stuff that people knew about in the art?

13 MR. WILSON: So --

14 JUDGE DOUGAL: Can you help there?

15 MR. WILSON: So I would say that, you know, KSR obviously
16 trumps Federal Circuit cases to the extent they're in conflict. It's a Supreme
17 Court case. But I don't know of a more direct case addressing the question
18 Your Honor is raising. But let me point out why I think this is not really an
19 issue in our case.

20 What do we know that Yeh discloses? Yeh discloses using a high-
21 pressure screen, upstream near the heel and a low-pressure screen near the
22 toe. And Yeh discloses that the upstream high-pressure screen is a
23 concentric screen; and the low-pressure screen can be an eccentric screen,
24 and that requires the use of a crossover joint.

25 Now, Yeh also teaches us that that crossover joint causes
26 problems. Because you have an offset base pipe or primary bore, it's hard to

1 get tools down there. So you have to make that tool longer to reduce the rate
2 of curvature so you can force tools around that curve. And Dr. Durham
3 admits all that. And in fact, Yeh teaches -- and he admits that Yeh teaches.
4 It's a problem that has to be overcome. So those are Yeh's teachings.

5 Now, wouldn't it be obvious for a person of ordinary skill in the art
6 to say, I only have two choices here, concentric screen or eccentric screen.
7 If I try an eccentric screen, it does away with this problem that Yeh is telling
8 me I have with this offset, primary flow path. Why wouldn't I do that?
9 What am I -- what teaching in Yeh am I running into conflict with? I'm
10 honoring all of Yeh's teachings. I'm doing exactly what Yeh told me. I'm
11 honoring the fact that I need a high-pressure screen and I'm honoring the fact
12 that Yeh tells me that crossover joint creates a problem.

13 Now, if a person of ordinary skill in the art can't fit those things
14 together, then they don't have any skill. I mean, that just doesn't make sense.
15 So I don't think those things are actually in conflict. If we honor Yeh's
16 teachings exactly as Yeh puts them, a person of ordinary skill in the art
17 would be motivated to use an eccentric screen upstream.

18 JUDGE KINDER: Mr. Wilson, this is Judge Kinder. You're about
19 three minutes in your opening. If you want to go into your rebuttal, you're
20 welcome.

21 MR. WILSON: Okay. So I have three minutes left in my
22 opening?

23 JUDGE KINDER: In your opening, I think.

24 MR. WILSON: Okay. Thank you. So just in the last three
25 minutes, I want to address Claims 26 and 37 of the revised Motion to
26 Amend. And we'll see this, I'm going to start at Slide 84.

1 Okay. And we can see that Claim 26, again, addresses a
2 proportion. We've got to have the same base pipe inside diameter and the
3 same overall tool outside diameter. Now, again, on Slide 85, I'm going to
4 jump into the rationale for that. But here's another situation where we have
5 cited *Smith v Nichols*, *Gardner v TEC*, changing form, proportion, or degree
6 will not sustain a patent. Ratios of dimensions that do nothing surprising or
7 nothing unexpected are not patentable.

8 Now, we made that argument. Halliburton has no response to it.
9 So we can stop right there and agree that these claims are not patentable.

10 Now, the rationale for this is that if I use a certain size casing, I can
11 drill a maximum size open hole. All these tools have to go in the same open
12 hole. They have the same outside constraint, the outside dimension
13 constraint. The same is true if we deal with the base pipe, right? The base
14 pipe, if I string together a bunch of tools and they have inconsistent base
15 pipe sizes, now, when I have to run tools down the tubing string, I've got a
16 problem, right? I may hit a point at which the tools won't go, or they may
17 not come back when I try to pull them out. So it's a problem.

18 We addressed both of those constraints in our opposition.
19 Halliburton says nothing about either one of them. Those are motivations to
20 use the same consistent diameter in both the exterior of the tool and the
21 interior. And Halliburton says you're addressing those points in isolation.
22 But those are constraints on tool design. The base pipe doesn't have to be a
23 certain size. It doesn't have to be some maximum size. It just needs to be
24 consistent. It needs to be the same size so I can run a tool string down.

25 And with that, if there are no questions, I'll save the rest of my
26 time.

1 JUDGE DOUGAL: All right. Thank you.

2 MR. WILSON: Thank you, Your Honor.

3 JUDGE DOUGAL: Patent Owner, you can begin whenever you're
4 ready.

5 MR. WALTERS: Your Honor, I'd like to see my slides on this
6 screen, so I'm going to move my laptop. Can we switch it? I know they
7 were able to switch it earlier.

8 JUDGE DOUGAL: I'm not for sure. Is there any way we can put
9 it on the screen as well?

10 MR. WALTERS: I switched to this one. Okay. Great. I'll switch
11 it back.

12 May it please the Board. I'd like to start with the wall thickness
13 limitation of Claim 1 and specifically at Slide 13. We know that the wall
14 thickness limitation requires that the thickness of the transport tube and the
15 first sand screen assembly be greater than those of the second sand screen
16 assembly. It's clear that Petitioner relies on Yeh's concentric upstream
17 screen as the first assembly and the downstream eccentric screen as the
18 second.

19 Yeh's upstream screen is required to withstand 6,500 psi near the
20 heel of a 5,000-foot wellbore. But only six-by-three concentric screens were
21 able to withstand that pressure at the time.

22 Moving to Slide 15. Petitioner's expert agreed that Yeh's upstream
23 screen was a six-by-three design. And Yeh² makes this clear when it says,
24 to extend alternate path technology to 5,000 feet, it required an increase in
25 the number of shunt tubes.

26 Moving to Slide 16. This slide shows more evidence that Yeh's

1 upstream's concentric screen is a six-by-three. The petition describes Yeh2,
2 which we know describes a six-by-three concentric screen as the same APT
3 system as Yeh for the same 5,000-foot wellbore.

4 Moving to Slide 17. The reason this is important is that the six-by-
5 three concentric screen, we know had thinner walls than the walls in the
6 downstream two-by-two eccentric screen in Yeh. And that's the opposite of
7 what's required by Claim 1.

8 Moving to Slide 18. This is again confirmed by Petitioners expert
9 showing the thickness of rectangular tubes greater than that of the round
10 tubes used on concentric screens.

11 And moving to Slide 19. The two walls of the two-by-two
12 eccentric screen are here shown as thicker than those of the six-by-three
13 concentric screen.

14 Moving to Slide 20. Petitioners only cite in the art about wall
15 thickness is in Yeh, and it refers to the wall thickness of the crossover joint.
16 And it just says that it must be thick enough not to collapse. It does not talk
17 about varying wall thickness to change pressure requirements. And notably,
18 as Your Honor noted in this passage, Yeh identifies limiting the inside
19 diameter of the crossover joint as a problem.

20 In the next paragraph and moving to Slide 21, Yeh states its desire
21 to maximize the inside diameter of the primary flow path.

22 Moving to Slide 22. But if you're going to increase the wall
23 thickness of the upstream screen tubes in Yeh, then you're necessarily going
24 to reduce the diameter of the primary flow path, as we show. And that's
25 what Yeh taught against doing.

26 Moving to Slide 24. Petitioner's Barry reference also confirms that

1 the larger shunt tubes in six-by-three screens are not an option because the
2 screens become too large. So again, it's not an option to increase the
3 thickness of Yeh's upstream concentric tubes.

4 Moving to Slide 25. Now, Petitioner also opines that maybe you
5 don't increase the wall thickness of the upstream tubes, but instead you
6 decrease the -- you make the walls of the downstream eccentric screen
7 thinner in order to meet the claim language. But Yeh teaches to use
8 eccentric screens for their lower cost and more availability. Yeh
9 consistently teaches that you want to use eccentric screens for as long as you
10 can.

11 Moving to Slide 26. If you make the walls of the eccentric screen
12 thinner, then they're not going to be able to pack to 3,000 feet and 3,000 psi.
13 Thinner walls, they're going to be lower pressure rating. And you're actually
14 going to use them less than Yeh. Yeh is going to have to use a concentric
15 screen for even longer, which is not what Yeh wants to do.

16 Moving to Slide 27. Petitioner's art actually does teach why
17 concentric screens in Yeh achieve higher pressure. It's through reduction of
18 tube cross section, changes in tube shape, increase in the number of tubes,
19 and adding manifolds. If it was so obvious to just increase wall thickness for
20 a tube for higher pressure, then why wouldn't Yeh say it somewhere? Why
21 wouldn't any reference say it somewhere?

22 Moving to Slide 29. The Yeh references also identify a number of
23 performance metrics that must be balanced for sand screens, including
24 extending packing length and increasing pressure rating.

25 And on Slide 30, we show a number of parameters actually taught
26 by the art to increase pressure ratings, minimize friction pressure loss, and

1 extend packing length and wall thickness is not identified at all.

2 Moving to Slide 31. Yeh and Yeh2 met the need for packing
3 longer links at higher pressure with an opposite solution. They increased the
4 number of shunt tubes and made the walls thinner.

5 Moving to Slide 32. We noted that Yeh's upstream screen that's in
6 our briefing requires a six-by-three concentric screen. That's Petitioner's
7 initial argument. But after we demonstrated in our Patent Owner response
8 that Yeh's upstream concentric six-by-three screen actually had thinner
9 walls, Petitioner said, oh, well, maybe the upstream screens in Yeh, the
10 concentric were two-by-two, and so maybe there's room to thicken the walls.

11 Again, that's a new argument that's not in the petition. But there's
12 no evidence anywhere in the record that a two-by-two concentric screen
13 could achieve anywhere near the pressure requirements of Yeh, which is
14 6,500 psi. That's why Yeh is using a six-by-three concentric screen. If there
15 was a two-by-two concentric screen out there that could have achieved that,
16 we would have expected to see a cite to it in the record. Petitioner's
17 obviousness theory relies on Yeh's upstream concentric screen, which is six-
18 by-three with intentionally thinner walls than the downstream two-by-two
19 eccentric screen.

20 Moving to Slide 34. Another issue with the two-by-two concentric
21 screens is that they were outperformed by two-by-two eccentric screens
22 because the eccentric screens had more space for its shunt tube. So just
23 think the art is clear that the two-by-two eccentric was better than a two-by-
24 two concentric.

25 And moving to Slide 35. Because the two-by-two eccentric
26 screens outperform the two-by-two concentric screens, there is no reason

1 that the two-by-two concentric screens would have been used upstream of
2 Yeh's two-by-two eccentric screen. They certainly weren't related to
3 -- weren't rated to 6,500 psi as Yeh required.

4 Moving to Slide 36. Again, we know that two-by-two eccentric
5 screens were limited to 3,000 psi and 3,200 feet. So it's simply not the case
6 that Yeh would have used a less performing two-by-two concentric screen
7 upstream of the eccentric screen. And it's the two-by-two concentric screen
8 that Petitioner says would have room to thicken the transport walls. Because
9 we know the walls of that six-by-three concentric screen were actually
10 thinner than those of the downstream eccentric screen.

11 Moving to Slide 38. Petitioner's reply even acknowledges that the
12 art says nothing about wall thickness. Yeh never specifies the wall thickness
13 for any shunt tubes. And Yeh2 says nothing about tubing wall thickness at
14 all.

15 Are there any questions about the wall thickness issue? Okay. I'd
16 like to add -- I'd like to address the Barlow equation that the Petitioners
17 Counsel brought up. Again, as Your Honor noted, it is an equation for a
18 single tube. This was actually in the record in our briefing. Our Patent
19 Owner response at page 35 cited to Durham's declaration, Exhibit 2002, at
20 paragraph 139, where he noted that the Barlow equation for is a single tube
21 and did not consider that there are six transport tubes in the screen at issue.

22 And what it does not account for is that if you change the wall
23 thickness for shunt tubes, you're directly affecting multiple other parameters
24 of the design, the number of tubes that can fit, the geometry of tubes, the
25 spacing for tubes, whether they're open or closed ended, the nozzle size and
26 spacing. It's not just picking one variable to change. And Petitioner does

1 not account for those other implications.

2 Your Honors, I'd like to move to Claims 2 and 4, specifically Slide
3 39. Claims 2 and 4 require using larger nozzles and more nozzles and the
4 downstream sand screen simply.

5 Moving to Slide 40. And Petitioner points to Figure 7 of Yeh2 to
6 show the problem. But what this figure also shows is that Yeh2 addressed
7 the problem with a different solution. Yeh2 addressed the problem using
8 closed ended packing tubes in order to achieve more even flow.

9 Moving to Slide 41. Yeh and Yeh2 also teach away from
10 increasing nozzle size and number. So Yeh uses eccentric screens
11 downstream for lower friction pressure drop and to extend their packable
12 length. If you're going to increase the nozzle size, or the nozzle using more
13 nozzles or increase the nozzle size, you are necessarily going to increase the
14 friction pressure drop and reduce the packable length, which is the opposite
15 of what Yeh and Yeh2 want to do.

16 Moving to Slide 43. Petitioner suggests that increasing the nozzle
17 size or adding more nozzles is merely a result effective variable, subject to
18 routine optimization. But there's numerous design parameters and
19 performance metrics at play. We know friction loss, fluid leak off closed
20 into tubes, nozzle, size, and number are not merely result effective.

21 So to summarize these two claims on Slide 44, Yeh2 does not
22 identify declining flow rate as a problem. But even so, it achieves more
23 even flow rate by a different solution, using a closed ended packing tube.
24 An increasing nozzle size and number of the downstream eccentric tubes
25 works against Yeh's teaching, which is to use eccentric screens for their
26 lower friction and to extend the packable length.

1 Moving to Dependent Claim 5 in Slide 45. The claim requires
2 -- this claim requires cross-sectional flow areas in the first and second
3 transport tubes is the same. And on Slide 45, we show the Petitioner
4 actually compares cross-sectional flow areas of round tubes to round tubes
5 and rectangular tubes to rectangular tubes.

6 Moving to Slide 46. But we know that Yeh and Yeh2 and the
7 downstream eccentric tubes were rectangular, the upstream concentric tubes
8 were round, and the cross-sectional flow area of the rectangular tubes was
9 over two times larger than that of the round tubes.

10 Moving to Slide 48. Petitioner's expert, again, confirms here that
11 the cross-sectional flow area of the six-by-three screen tubes was smaller
12 than that of the eccentric rectangular tubes. Yeah, I'll just say the cross-
13 sectional flow area was less. And again, on Slide 49, he makes a similar
14 admission.

15 Moving to Slide 52. The art is consistent. So this slide addresses
16 the new theory of, well, maybe Yeh is -- uses two-by-two concentric screens
17 upstream. The art is consistent in teaching that transport tubes in two-by-
18 two eccentric screens would have a larger cross-sectional flow area than
19 those in two-by-two concentric screens because there's more space for the
20 tubes.

21 In Slide 53, Petitioner, again, acknowledged that the eccentric
22 screens were used because they provided more space for larger shunt tubes.

23 So moving to Slide 54. Again to summarize, Petitioner initially
24 compares round tubes to round tubes and rectangular tubes to rectangular
25 tubes. But the Yeh reference mapped for Claim 1 actually uses smaller
26 round tubes upstream and larger rectangular tubes downstream, which the art

1 consistently teaches achieves a greater cross-sectional flow area. And even
2 under the new theory that Yeh might use a two-by-two concentric screen
3 upstream, Petitioner's admitted that the eccentric screens were still larger
4 than those of the concentric screens.

5 I'd like to address Independent Claim 14, which requires
6 determining -- and I'm on Slide 56. This requires determining shunt to
7 pressure associated with the distal end of the production zone and selecting a
8 low-pressure shunt tube system based on the distal end pressure.

9 Moving to Slide 57. Petitioner's position relies on the toe being the
10 distal end. But as we show on Slide 58, Petitioner also relies on the pressure
11 determined 3,000 feet from the toe for the determining and selecting steps
12 that contradicts Petitioner's reliance on the toe as the distal end. The art does
13 not teach determining shunt to pressure associated with the distal end in
14 selecting a system based on that determined pressure.

15 Moving to Claim 21 and specifically at Slide 60. This claim
16 recites the first material of the first sand screen assembly has a greater
17 tensile strength than the second material of the second sand screen assembly.

18 Moving to Slide 61. Now, Petitioner argues that using lower
19 tensile strength material in the downstream eccentric screen would save cost.
20 But again, Yeh teaches away from downgrading the eccentric screens. If
21 you're going to use a lower tensile strength material downstream, you are
22 necessarily going to compromise the performance of that eccentric screen.
23 And again, Yeh wants to maximize use of the eccentric screen to extend
24 packable length and achieve 3,000 psi pressure differential.

25 Moving to Slide 62. If you did weaken the eccentric screen by
26 using a lower tensile strength, then you would have to pack more of the

1 interval with a higher cost and less available concentric screen, as Yeh
2 describes.

3 And unless there are any questions, I'd like to move to the revised
4 Motion to Amend. Okay. Moving to Slide 64. As we show on this slide,
5 most of Petitioner's Motion to Amend grounds rely on Bonner's eccentric
6 screen upstream of Yeh's eccentric screen.

7 And Slide 67, 68, and 69 include Claims 29, 31, and 38, which
8 show the independent claims that show that limitation. Moving to Slide 70.
9 So for these claims, Petitioner relies on substituting Bonner's eccentric
10 screen for Yeh's upstream concentric screen.

11 Moving to Slide 71. We know that Yeh's upstream concentric is
12 required to withstand 6,500 psi to pack a 5,000-foot horizontal interval.
13 Moving to Slide 72. Even under Petitioner's reading of Bonner, Bonner's
14 eccentric screen can only withstand 5,000 psi. So in order to substitute
15 Bonner's eccentric screen, it still needs to withstand an additional 1,500 psi
16 to get to 6,500. And Petitioner says, oh, well, you would just thicken the
17 walls to get to 6,500.

18 JUDGE DOUGAL: So you've kind of mentioned this before and
19 into the other argument a minute ago. But why wouldn't one skilled in the
20 art use three types of screens, you know? Why can't you use Bonner in the
21 section that's below 5,000 psi and then, you know, irrelevant to kind of what
22 we're talking about -- it has some other screen that's a higher-rated screen for
23 5,000 and 6,000? As long as you have a screen rated at 5,000 in this section
24 and a lower screen -- lower at 3,000 psi rated screen for the lower section,
25 what's the problem with that?

26 MR. WALTERS: Well, the one issue is that Petitioner's main

1 motivation to make the substitution is to eliminate the crossover tool of Yeh.
2 That's why Petitioner suggested, oh, well, we need to get from 5,000 to
3 6,500, we'll just thicken the walls. Therefore, we still get rid of the
4 crossover tool. Again, as we noted, that completely renders Yeh inoperable
5 for its intended purpose. Yeh completely teaches away from that by
6 focusing its whole invention on the crossover tool between these two
7 screens.

8 JUDGE DOUGAL: So Petitioner didn't have any art to cite or any
9 case law. Do you have any case law, any guidance to help us in this to
10 -- how to deal with KSR and the line of cases dealing with inoperable for its
11 intended purpose? Because, I mean, Yeh has general teachings, right?

12 One skilled in the art could consider general teachings independent
13 of the main focus of Yeh. Is that inappropriate for us to do, to ignore the
14 crossover joint and look at the background and look at the overall teachings
15 of Yeh, independent of the crossover joint, if this exclusion, where they're
16 taking or they're removing it?

17 MR. WALTERS: To answer your question on case law, Your
18 Honor, Slide 82 is the case law that we cited. I'm not aware of any other
19 case law that would go beyond what is told here. And I would just say that
20 one of skilled in the art is taking Yeh. Yeh is describing actual systems. So
21 we talk about Yeh describing a six-by-three concentric screen to get to 6,500
22 psi. These are industry publications.

23 Yeh is citing an actual system, it's an actual six-by-three concentric
24 screen. Yeh references Yeh2, Hecker; Yeh '476, Barry. They all talk about
25 this alternate path technology to extend to 5,000 feet and 6,500 psi as a six-
26 by-three concentric screen. And so to answer the question, one of skilled in

1 the art is looking at Yeh as this actual system.

2 How do I improve on it? It's not looking at Yeh is, oh, well,
3 maybe Yeh actually does mention that some concentric screens could be
4 two-by-two. Those are irrelevant. Because we didn't even know that the
5 two-by-two concentric screens are not near enough quality to withstand the
6 pressures that Yeh is teaching. So I -- when I look at Yeh and I look at all
7 these references that Yeh refers to, I look at Yeh in terms of, wow, this is an
8 actual system in operation. How do we improve it?

9 Moving to Slide 74, Your Honor. Upon reading Bonner, we know
10 that its eccentric screen was not designed to withstand even 5,000 psi in
11 operation. This was a burst pressure under a test. The Bonner reference
12 itself specifically advises one of skilled in the art to use a safety factor of
13 1.33 so it's -- this isn't whether a safety factor was common in the industry.
14 If we're going to look at Bonner, use Bonner screen, it says, use a 1.33 safety
15 factor for a working pressure, which is what we need.

16 Moving to Slide 75. We know that using a safety factor for
17 working pressure was common in the industry. It specifically -- idea is
18 specifically referenced in multiple references, and this is the Barry reference,
19 where we're talking about the 10,000 psi test pressure for 6,500 actual in
20 operation.

21 Moving to Slide 76. The art discussing the conventional eccentric
22 screens that we know were rated to 3,000 psi describes them as having a
23 burst pressure of 5,000 psi, which is what Bonner teaches.

24 Moving to Slide 77. It also describes the same screens as having a
25 working pressure of 3,000 psi, which is consistent with what Yeh states.
26 The point here is that Bonner is not describing some eccentric screen that

1 was any better than conventional at the time and certainly was not describing
2 some eccentric screen with an improved pressure rating of 5,000 psi.

3 The Bonner reference doesn't talk about increasing operational
4 pressure rating over existing screens ever. It actually -- if you look at
5 Bonner on page 1, it's talking about a new seal design to improve sealing
6 capability. It's talking about the seals and the joints. Even at the conclusion
7 of the abstract, the improved pressure sealing, erosion resistance,
8 ruggedness, improved rig assembly times, and system qualification will be
9 presented in the paper. It's not talking about a new screen that somehow
10 could withstand a significantly higher pressure than conventional eccentric
11 screens.

12 JUDGE DOUGAL: Counsel, for reference, that's exhibit 1016,
13 what paragraph are you referring to?

14 MR. WALTERS: The abstract on page 1, Your Honor.

15 JUDGE DOUGAL: Okay. Thank you.

16 MR. WALTERS: Moving to Slide 78. Petitioner's expert even
17 brought up applying a safety factor on his own. He described it as
18 Petroleum Engineering 101. So this is the same -- this question is on the
19 right, we're talking about the Barry reference. And it's the same portion of
20 the Barry reference the Petitioner's counsel just showed you that suggested
21 that there was no safety factor evident.

22 But the Petitioner's expert actually said there was. He says, I
23 mean, this is Petroleum Engineering 101, you know. I mean, all casing, you
24 have a working pressure, you have a test pressure. You commonly want to
25 test it higher than whatever you're going to require. That throws in a safety
26 factor. So he actually says the Bonner right there is describing a safety

1 factor. And on the left, we show that he did not consider a safety factor at
2 all when analyzing Bonner, even though Bonner specifically advises to use
3 it.

4 Now, Slide 79 shows the various relevant pressure ratings given
5 the art. We have Yeh's requirement of 6,500 psi working pressure. We have
6 Bonner's burst pressure eccentric screen, which is -- only gets to 5,000 psi.
7 If you apply the safety factor that Bonner advises, you get to 3,760 psi. And
8 we know that Yeh's downstream eccentric screen is rated to 3,000 psi.

9 And Petitioner's position is to replace or substitute Yeh's
10 conventional screen, concentric screen with Bonner's eccentric screen.
11 Yeh's concentric screen fills this gap of 3,000 to 6,500 psi. Bonner safety
12 factor only gets to 3,760 psi. The fact that you would go from 3,760 to
13 6,500 by just changing the wall thickness, as Petitioner suggests, is pure
14 hindsight.

15 Petitioner makes an argument that it's just an obviousness to try
16 issue that we didn't respond to. That's not the case. Obvious to try requires
17 a finite number of predictable solutions. Well, just replacing Bonner's
18 eccentric screen in Yeh doesn't get you a -- it's not a solution at all. We
19 explained in our briefing why it wouldn't work. You still don't get to Yeh's
20 6,500 psi requirement. So substituting Bonner is not a solution at all.

21 And we also know with -- on the wall thickness issue, that the art
22 actually taught changing a host of other parameters to increase pressure
23 rating, not wall thickness, tubing geometry, tubing size, cross-sectional flow
24 area, geometry of the screens.

25 Moving to Slide 81. Again, the reason Petitioner suggests that you
26 would replace Yeh's upstream concentric screen with Bonner's eccentric

1 screen is to get rid of Yeh's crossover tool. But Yeh's whole purpose is the
2 crossover tool. That's Yeh's invention. If you remove it, you render Yeh
3 inoperable for its intended purpose.

4 Moving to Slide 83. Now, at one point, Petitioner also claims that
5 you would substitute Yeh's concentric screen with Bonner's eccentric screen
6 to make it easier to install. And Bonner does say that it's easier to install.
7 But it's easier to install over existing eccentric screens. Here, you're having
8 to replace a concentric screen with an eccentric screen. And the art is clear,
9 as we show on this slide, that concentric screens were already installed twice
10 as fast as eccentric screens. So there's no benefit there.

11 And again, as I noted on Slide 84, Petitioner argues it would have
12 been obvious to try, it requires a finite number of identifiable, predictable
13 solutions. This is not a solution because you can't get to replacing the Yeh's
14 concentric screen with Bonner's eccentric screen. You cannot get to 6,500
15 psi. You thicken the walls; that's not a finite solution. It's not taught by the
16 art. The art actually teaches modifying a number of other parameters, as I
17 noted, in order to increase the pressure rating of the shunt tube systems.

18 Moving to Claim 24. This claim requires that spacing is different
19 between adjacent nozzles on different shunt tube assemblies.

20 Moving Slide 86. Now, Petitioners argues that decreasing flow
21 motivated decreasing nozzle spacing along a particular packing tube. But
22 the claim actually requires two packing tubes, each with different nozzle
23 spacing.

24 Moving to Slide 87. The references actually teach uniform nozzle
25 size and spacing across packing tubes. And as we've noted earlier, with
26 respect to Claims 2 and 4 on Slide 88, we show that Yeh addresses declining

1 flow rate, which it doesn't identify as a problem, but it addresses declining
2 flow rate with a different solution, and that's closed ended packing tubes.

3 Moving to Claim 26 in Slide 90. So Claim 26 requires the
4 upstream and downstream screens to have the same size base pipes and outer
5 diameters. Because it depends from Claim 1, it also requires that the
6 upstream screen have thicker walls. And Petitioner's position relies on the
7 concentric screen upstream and an eccentric screen downstream because it
8 depends from Claim 1.

9 On Slide 91, we show the Petitioner's opposition addresses base
10 pipe size and outer diameter in isolation without addressing the same size
11 limitations for both concentric and eccentric screens.

12 In Slide 92, Petitioners otherwise argue that eccentric screens
13 permitted larger base pipes than concentric screens. And moving to Slide
14 94. As we discussed earlier, Petitioner's position for Claim 1 requires a six-
15 by-three concentric screen upstream with a thinner shunt tube walls than the
16 downstream two-by-two eccentric screen.

17 And moving to Slide 95. So to meet the limitations of Claim 26
18 under Petitioner's position, one would have to thicken the upstream six-by-
19 three screen, two walls, while maintaining the same base pipe size and outer
20 diameter. There's no explanation from Petitioners to how one of skilled in
21 the art would do this, given the constraints of the system.

22 Moving to Claim 37, Slide 96. This claim also requires upstream
23 and downstream screens to have the same size base pipe and outer
24 diameters. In this case, both the screens are eccentric.

25 And moving to Slide 97. Petitioner relies on its arguments against
26 Claim 26. But we know that for Claim 26, the upstream screen is concentric

1 and the downstream screen is eccentric. So Petitioner has not met its burden
2 of showing same base pipe size and same outer diameter for Claim 37
3 because we're talking about different screens that are required versus Claim
4 26.

5 I'd like to now move to Claims 27, 33, and 40, which require the
6 upstream packing tube interconnected to the downstream junction block.
7 Moving to Slide 99. Petitioner argues that these limitations are met through
8 Yeh's crossover tool and Bonner's box crossover. Both of these are on the
9 upstream end.

10 Moving to Slide 100. The '007 Patent is clear that the
11 interconnection establishes fluid communication to the downstream junction
12 block. So we have here the quote, "They are interconnected using jump
13 tubes to establish fluid communication there between. In particular, the
14 packing tube of an upstream sand screen assembly is interconnected to the
15 shunt tube junction block." So the interconnection establishes fluid
16 communication. And Petitioner's alleged interconnection does not have that
17 fluid communication.

18 Moving to Slide 101. At the bottom, one of -- well, I'll say one of
19 Petitioner's arguments is that the Figure 2 of the '007 Patent doesn't describe
20 the interconnection between the packing tube and the junction block. But
21 this portion of Figure 2 on this slide actually shows that it does. It says -- or
22 the portion of the specification shown on the slide does. It says, each shunt
23 tube assembly described herein, including shunt tube assemblies of Figure 2,
24 generally include a junction block -- a packing tube extending from a
25 junction block. So it's clearly supported.

26 Moving to Slide 103. For Claim 27, Yeh's crossover tool does not

1 even contain a packing tube. It's just a wall, there's no nozzles there.

2 On Slide 104, we show that Petitioner acknowledged it's a
3 transport tube and not a packing tube. Moving to Slide 105. Yeh2 teaches a
4 closed ended packing tube, so there's no interconnection to a downstream
5 junction block.

6 And moving to Slide 106. The same with Bonner, there's no
7 interconnection to a downstream junction block.

8 And finally, Your Honors, Claim 36, Slide 108. This claim recites
9 the downstream low-pressure system allows a larger volume of fluid flow
10 there through than the upstream system.

11 Moving to Slide 109. The patent makes clear that the fluid flow
12 through the system is through the nozzles. The portion of the specification
13 cited here states, it's selected to allow a larger volume of fluid to flow there
14 through than that of the first sand screen assembly by adjusting cross-
15 sectional flow areas location and number of nozzles.

16 Petitioner's theory for the limitation, as we show in Slide 110,
17 would render it indefinite, as Petitioner admitted. But it does not consider
18 the specification. If we look at the specification and when we talk about
19 flow there through, then it's flow through the nozzles. And so when you
20 have two competing constructions, and one would be definite, one indefinite,
21 the Federal Circuit has stated that you construe the claim to be definite. It's
22 clearly supported by the specification.

23 And moving to Slide 111. Petitioner's expert actually
24 acknowledged that the prior art systems, at the time, had not achieved
25 greater fluid flow through the downstream nozzles. So there's no prior art
26 teaching this limitation.

1 And unless there are further questions, I'll like to reserve the rest of
2 my time.

3 JUDGE KINDER: All right. You have about 11 minutes left, we
4 can put that on to your time.

5 MR. WALTERS: Thank you, Your Honor.

6 JUDGE DOUGAL: Petitioner, whenever you're ready for your
7 rebuttal.

8 MR. WILSON: Thank you, Your Honors. We're going to switch
9 to our presentation. We're going to start at Slide 9. Now, I'm going to
10 bounce through a number of issues. But, Your Honors, if the argument
11 raised any specific questions you have you'd like for me to address, please,
12 just ask. I'm happy to jump to whatever Your Honors have questions about.
13 Otherwise, I'll just start bouncing through points.

14 First, Halliburton argues that only six-by-three screens can
15 withstand 6,500 psi. What do they cite for that? They don't cite anything at
16 all. We have an equation here, equation 14, that tells us how to get to any
17 burst pressure we want with a round tubing. Why can't I have two tubes that
18 can hold 6,500 psi? There's no reason. All I have to do is adjust tubing wall
19 thickness. So getting a two-tube concentric screen that can hold 6,500 psi is
20 a certainty. Not a likelihood of success, it's a certainty. We have equation
21 14 that tells us exactly how to do that.

22 Now, I want to jump to -- let's jump to Claim 24, Slide 100. Now,
23 Claim 24 is adjusting nozzle spacing within a given sand screen. And so I'm
24 going to jump to Slide 103. What we argued is that the use of Jones2's
25 packing tubes on a single sand screen meets this claim. Halliburton doesn't
26 contest that. If you have two of Jones2's Figure 3s on a single sand screen, it

1 meets the claim.

2 And you'll see that as we jump to Slide 105, you've got different
3 spacing between the two sets of nozzles there. So if you have two of these
4 on a sand screen, it meets the claim.

5 Now, what they do argue is that Claim 24 requires uniform
6 spacing. So let's go back to Claim 24, Slide 101. And you will not find any
7 language in here that refers to uniform spacing, simply not a limitation of the
8 claim. It says wherein the second sand screen assembly further comprises a
9 second shunt tube assembly in addition to the shunt tube assembly of the
10 second sand screen assembly.

11 And wherein a spacing between adjacent nozzles of the second
12 shunt tube assembly is different than a spacing between adjacent nozzles of
13 the shunt tube assembly of the second sand screen assembly. It just got to
14 have different nozzle spacings between adjacent nozzles. It says absolutely
15 nothing about uniform space.

16 Now, there was an argument against result effective variable that
17 Counsel raised, in which they said -- can you pull up the Gardner, in which
18 they said, well, there's all these factors you have to consider, right? You got
19 to consider, you know, primary bore size, you got to consider borehole size,
20 you got to consider all these various things.

21 But the law actually says something different. If we look at the
22 Gardner case, and this was cited in our opposition to their revised Motion to
23 Amend. And that looks a little hard to read, but I'll read it for you. In the
24 highlighted portion here, the Federal Circuit says, "It is indisputable from
25 the record that a Gardner version of a Vits drier produces some suction at the
26 edge.

1 "It is equally indisputable, however, that pressure profiles are a
2 complex function of nozzle size, nozzle direction, and plenum pressure, to
3 name the few variables referred to by the trial court. Claim 1, however, is
4 not limited to any of these variables. Thus, no unique pressure profile arises
5 from the combination specified therein and any advantage alleged to derive
6 from the existence of such a pressure profile is eliminated from
7 consideration."

8 The court goes on to say, "The trial court would not have been
9 clearly erroneous in concluding that the dimensional limitations did not
10 specify a device which performed and operated any differently from the
11 prior art. Its decision therefore stands."

12 It doesn't matter if there are a host of considerations in optimizing
13 a particular limitation, like tubing wall thickness if those host of
14 considerations aren't in the claim. Why? Because the claim doesn't require
15 you to optimize all those things. It just says have a thicker tubing wall
16 upstream. We know that. Yeh taught us that. Equation 14 taught us that.
17 How can that be patentable? It can't be.

18 Now, let's take a look -- I want to jump back to Claim 14. And
19 let's go back to the presentation if we can at Slide 43. So the issue here is
20 Claim 14[c], which requires determining a shunt tube system operating
21 pressure associated with the distal end of the production zone in selecting a
22 low-pressure shunt tube system based on the distal end determined pressure.

23 Now, what they said is that we didn't select a pressure based on the
24 distal end. We selected a pressure based on 3,000 feet from the distal end.
25 Now, here's our argument. This is it, right here on this slide. Yeh2 says in
26 Figure 15, it gives you the pressure profile from the heel all the way to the

1 toe, that's the blue line, and every point in between. You can see it's 5,300
2 psi at the heel. It goes down to almost zero at the toe.

3 Now, if we jump forward to Slide 44, this is the argument from the
4 petition. It says, "Thus, one of skill would have implemented Yeh's teaching
5 to use eccentric screens toward the toe at any point at which the slurry
6 pressure dropped below the pressure capacity of the eccentric screen shunt
7 tubes, okay? So we have a pressure profile that tells us the pressure down
8 the whole length of the horizontal well."

9 And our petition said, you can use an eccentric screen at any point
10 in which the slurry pressure is below that 3,000 psi limit, that includes the
11 toe. So you have a determined pressure at the toe, which is almost zero.
12 And it's below 3,000, so you can use an eccentric screen. And you don't
13 have to take our word for it.

14 And on Slide 46, Dr. Durham says the same thing. He's asked a
15 person of ordinary skill in the art would understand based on Yeh and
16 Yeh2's teachings, that they could begin using eccentric screens with a 3,000-
17 psi pressure rating at any point past 2,000 feet from the heel, roughly,
18 correct? In a 5,000 foot, well, somewhere in there, right. He agrees that a
19 person of ordinary skill in the art understood that. That's invalidity of Claim
20 14.

21 Now, for Claim 21, Counsel argued that you would not -- a person
22 of ordinary skill in the art would not decrease the tensile strength of the
23 tubes and a conventional eccentric screen because that would lessen the
24 length that you could pack with that eccentric screen. Now, the problem
25 with that is it assumes that the shunt tube itself is the limiting factor.

26 And as we saw from Bonner, that is not the case for conventional

1 eccentric screens. Bonner increased the pressure capacity of the jumper
2 tubes to increase the pressure rating of the screen as a whole. It was not
3 -- the shunt tubes were not the limiting factor. So reducing shunt tube burst
4 pressure would not reduce the usefulness of that screen, the conventional
5 screen.

6 All right. Let's talk about Claims 28 through 40 and the revised
7 Motion to Amend. Okay. The first argument after Your Honor asked a
8 question was that the motivation that we used for substituting Bonner was to
9 eliminate the crossover tool. But in our opposition, Paper 26, at page 8, we
10 listed a host of benefits that you would get from Bonner's screen, which are
11 taken straightly from -- straight from Bonner. So that only addresses one
12 motivation, not all of them.

13 Now, if we look at the Bonner's 1.33 safety factor -- and I covered
14 this earlier, but I'll reiterate it now -- we were told by Counsel that
15 conventional shunt screens had a 5,000 psi -- conventional eccentric screens
16 had a 5,000-psi pressure rating. As we saw from Bonner, that is not true.
17 The tubes were rated to 5,000 psi, not the screens. There were weaknesses
18 in the connections between the joints, as Bonner taught that would not allow
19 those screens to operate at 5,000 psi. So that's simply not true.

20 As far as a predictable solution, Counsel argued that increasing
21 Bonner's pressure rating is not a predictable solution because you still don't
22 get to 6,000 -- 6,500 psi. But the question is, why not?

23 If we go to Slide 33 in our presentation, we will see Dr. Durham
24 conceding. On the lower left, he's asked, "Do you agree that whatever the
25 relationship is between proportional and directly proportional, the pressure
26 containment capacity of a rectangular tube, all other parameters staying

1 equal is in some way proportional to the thickness of the walls of that tube,
2 correct?" "It's in some way related, yeah."

3 On the right, he's asked to -- he's asked about his declaration,
4 where he opines that, "The wall thickness of the eccentric screens is related
5 to the pressure rating, correct?" "Right." And we discussed that.

6 And if we turn to the next slide, Slide 34, here, he actually offers
7 the opinion that reducing the wall thickness in the downstream screens, that's
8 the eccentric screens, would further limit the use of the eccentric screen as it
9 would have reduced the pressure rating of those screens. He literally
10 testifies that it's proportional to pressure rating. So he himself, Halliburton's
11 own expert, is relying on the proportionality between wall thickness and
12 pressure rating.

13 Why isn't it predictable if you can go one way to go the other way?
14 If you can decrease the pressure rating by decreasing the wall thickness, why
15 can't you increase the pressure rating by increasing the wall thickness? The
16 answer is you can.

17 Now, let's jump to Slide 76. And I want to talk about Claims 27,
18 33, and 40. So this is the interconnection the Limitation 27[b] requires the
19 packing tube of the shunt tube assembly of the first sand screen assembly is
20 interconnected to a junction block of the second sand screen assembly. So
21 let's talk about the prior art first, which you can see on this slide. On the left
22 is Yeh. You can see that the packing tube is interconnected to the transport
23 tube, which is interconnected downstream to the next junction block.

24 You can see on the top right is Yeh2, where the same scenario
25 takes place. Packing tube is interconnected to a transport tube is
26 interconnected to a junction block. And Bonner, on the middle right, is the

1 same, same arrangement. All the prior art has this same arrangement.

2 Now, if we turn to Slide 78 and we look at Figure 3 of the '007
3 Patent, guess what? It's the same arrangement. Packing tube is
4 interconnected to a junction block, which is interconnected to a jumper tube,
5 which connects you to the downstream junction block, shown there in
6 purple. It's the same prior art arrangement.

7 Why does this matter? Because Patent Owner told us that Figure 3
8 is written description support for these claims, Claims 27, 33, and 40. If
9 that's the case, the prior art meets this limitation. That's it, full stop.

10 But we can go even farther. If we look at the text here, you can see
11 what the patent actually says. This is from column 7 of the patent, it says, a
12 jumper tube, 240B, interconnecting shunt tube assembly 204 with shunt tube
13 assembly 308. It describes these shunt tube systems as being interconnected.

14 Now, when we jump to the passage that Halliburton talked about
15 earlier, this is in column 10, if we look at the middle of column 10, which is
16 the top portion, it says, turning to Figure 5, a method 500 of installing a
17 completion assembly and a wellbore is generally illustrated.

18 Now, we're going to talk about how to install the apparatuses that
19 we've already talked about, okay? We drop to the bottom of column 10, it
20 says, in this regard, that base pipes of the assemblies are interconnected and
21 likewise, as described above. Where above? Figure 3 that we just looked at,
22 it says adjacent shunt tube assemblies are interconnected, using jump tubes
23 to establish fluid communication there between. That's the passage we just
24 read, talking about Figure 3.

25 It says, in particular, the packing tube of an upstream sand screen
26 assembly is interconnected to the shunt tube junction block of a downstream

1 sand screen assembly. What's it talking about? It's talking about Figure 3,
2 the exact same arrangement we just looked at in all the prior art. There's no
3 way to argue that the '007 Patent discloses a packing tube directly connected
4 to a downstream junction block. It simply doesn't disclose it.

5 Let me jump to the Figure 2 argument on Slide 81. So they assert
6 now -- and Dr. Durham brought this up in his deposition, so this is not
7 covered in any briefing except ours, this Figure 2 embodiment. He brought
8 it up as a brand-new theory at his deposition for disclosure. But let me say,
9 it doesn't matter whether Figure 2 discloses this or not. Figure 3 discloses
10 the prior art arrangement claims have to read on that arrangement. So we're
11 done, the prior art meets the claim.

12 But let's just push that argument aside for a second and let's
13 evaluate Figure 2. Figure 2 does not show a junction block. It doesn't.
14 You've got a shunt tube, a coupling, a jumper tube, and another coupling and
15 another shunt tube. There is no junction block shown in Figure 2. So
16 whatever the arrangement is in Figure 2, it doesn't involve a junction block,
17 as shown in Figure 2.

18 Now, let's talk about the last dying gasp of this argument, which
19 Halliburton used in its demonstratives, where it cites column 6 of the '007
20 Patent, which we don't have on a demonstrative, wasn't argued in any
21 briefing, didn't show up until their demonstratives. But let's address that
22 argument too. They focused on this passage, it's column 6, line 47, of the
23 '007 Patent. It says, each shunt tube assembly described herein and -- by the
24 way, this is in the context of Figure 3 we're talking. It says, each shunt tube
25 assembly described herein, including shunt tube assemblies 220 of Figure 2,
26 generally include a transport tube 310, and a packing tube 312, extending

1 from a junction block 314, so as to be in fluid communication with one
2 another.

3 What did it just describe? It says, I got a packing tube and a
4 transport tube that both extend from a junction block. That is the same
5 arrangement that's shown in Figure 3 and in all of the prior art. There is no
6 description in that passage of a packing tube connecting directly to a
7 downstream junction block. There is no disclosure in the '007 Patent of that
8 at all.

9 Now, I'll finish with Claim 36, so let's jump to Slide 114. Slide
10 114, Claim 36[b] says we're in the low-pressure shunt tube system is
11 disposed to allow a larger volume of fluid to flow there through than the
12 high-pressure shunt tube system is disposed to allow to flow there through.
13 So we're talking about flow through shunt tube systems. Not packing tube
14 nozzles, we're talking about flow through shunt tube systems.

15 Now, next slide, Slide 115, we describe what happens here and the
16 fact that that is not possible. And so we said, Claim 36 is not enabled and
17 has no utility because it's impossible.

18 If you look at Slide 116, you can see Dr. Durham agrees with us. I
19 agree with Mr. Chambers that Flow C could not exceed Flow A. It can't
20 happen, okay?

21 Back to Slide 115. So Halliburton argues that this term should be
22 construed narrowly to preserve its validity. But let's remember -- and they
23 argue that based on athletic alternatives. First problem with that is, let's
24 remember where we are. We're in a Motion to Amend. This is not an issued
25 claim. It has no presumption of validity.

26 So how do we get to construing it to preserve its validity? I don't

1 know. I don't -- how athletic alternatives could possibly apply. The second
2 problem with that is it has to be an equally plausible interpretation of the
3 claim. The claim refers to shunt tube system, not packing tube nozzles.
4 How do you exclude the transport tube from the shunt tube system, which is
5 what they're asking you to do? You can't.

6 Thank you, Your Honors.

7 JUDGE DOUGAL: Thank you, Counsel. And Patent Owner,
8 whenever you're ready, I believe you've got about 31 minutes left.

9 MR. WALTERS: Thank you, Your Honor. I will not need that
10 much time. I'd like Your Honors to just address two issues. One is the wall
11 thickness issue with Claim 1. There's no debate that it was a six-by-three
12 concentric screen that enabled Yeh to get to 6,500 psi. There's no debate
13 that a two-by-two eccentric screen -- excuse me, there's no debate that a two-
14 by-two concentric screen was less performing -- or I'll strike that. There's no
15 debate that a two-by-two concentric screen was less performing than a two-
16 by-two eccentric screen.

17 Yeh used a two-by-two eccentric screen to get to 3,000 psi because
18 a two-by-two concentric screen was less performing. We know it couldn't
19 have even gotten to 3,000 psi. It's the six-by-three concentric screen in Yeh
20 that gets to 6,500 psi.

21 So if we're going to meet Claim 1 limitation, thicker walls in the
22 upstream screen, we need to thicken the walls of the six-by-three concentric
23 screen. And as we show on Slide 22, that's virtually impossible, particularly
24 given Yeh's teaching that you want to maximize the primary flow path. I'll
25 note that -- and as I noted in my initial presentation, Petitioner has a theory
26 that you could thin the walls of the eccentric screen.

1 But it seems to me that Petitioner's whole obviousness theory relies
2 on this Barlow equation. And as Petitioner's expert, Mr. Chambers, said in
3 his declaration at its Exhibit 1003, at paragraph 230, and I think Petitioner's
4 counsel actually said this earlier today, the Barlow equation is for round
5 tubing only and does not apply to rectangular cross-section tubing. We
6 know that the downstream screen -- eccentric screen in Yeh is a rectangular
7 tube. So the Barlow equation doesn't even apply to that with respect to
8 thinning the tube walls in order to meet the claim limitation.

9 As we've noted, the Yeh, Yeh2 combination rated to 6,500 psi
10 actually taught thinner walls. And if Petitioner's logic was right that a higher
11 pressure necessitated thicker walls, then why did the art go in an opposite
12 direction? The art didn't thicken the walls. It thinned the walls and used a
13 larger number of smaller, round tubes.

14 I'd like to move to Slide 79 and address the Bonner issue. So
15 we've talked about Yeh requiring 6,500 psi. Yeh's eccentric screen can only
16 get to 3,000. Bonner can get to perhaps 3,760 or 5,000, but we know that's a
17 testing burst pressure. If Bonner was such an improved screen over
18 eccentric screens and it's rated to 3,700 or even 5,000, then why not just use
19 Bonner's eccentric screen in place of Yeh's eccentric downstream eccentric
20 screen? That would make the most sense given the prior art disclosures.

21 But the reason that's not what Petitioner proposed is because that
22 would not meet the claim language. You would still have a concentric
23 screen upstream and an eccentric screen downstream. And I'd like to note
24 the Sonosonics case from the Federal Circuit, this is a 1996 case. It's not cited
25 in our briefing, but it is Federal Circuit precedent. The cite is 81 F.3d 1566.

26 The Federal Circuit stated to draw a hindsight knowledge of the

1 patented invention when the prior art does not contain or suggest that
2 knowledge is to use the invention as a template for its own recognition, an
3 illogical and inappropriate process by which to determine patentability. The
4 invention must be viewed not after the blueprint has been drawn by the
5 inventor, but as it would have been perceived in the state of the art that has
6 existed at the time the invention was made.

7 And here, the state of the art was that no reference shows changing
8 wall thickness to achieve higher pressure. It actually shows the opposite,
9 thinner wall thickness in Yeh's upstream higher pressure screen. And there's
10 no reference showing an eccentric screen that can be substituted in Yeh to
11 achieve the requirements of Yeh as Petitioner requires. Petitioner says, oh,
12 you can just remove the crossover joint and make the walls thicker. But
13 that's the essence of what the Federal Circuit has said is improper using the
14 invention as a template for its own recognition.

15 Unless there are further questions, Your Honor, I yield the rest of
16 my time.

17 JUDGE DOUGAL: All right. Seeing none. Thank you for your
18 arguments. This concludes our hearing. Again, thank you both for your
19 time and preparations and your presentations today. They've been very
20 helpful for us as we decide how to handle this case. The cases are now
21 submitted. We request the parties to please stay and answer any questions
22 the court reporter may have. And this hearing is now adjourned.

23 (Whereupon, the above-entitled matter went off the record at 3:11
24 p.m.)

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