UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

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OPEN SESSIONS

Pages: 1 through 254 (with excerpts)

Place: Washington, D.C.

Date: March 18, 2024

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Shoals Technologies Group, LLC
EXHIBIT 2003
Voltage, LLC v.
Shoals Technologies Group, LLC
PGR2024-00022

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

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International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Monday, March 18, 2024

Volume I

The parties met pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

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*** Index appears at end of transcript ***

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: Good morning, everyone. Please be seated.

We're here for the evidentiary hearing in Certain Photovoltaic Connectors and Components Thereof, investigation number 337-TA-1365.

We're on the public record. Counsel, could you please enter your appearances.

MR. BARQUIST: Good morning, Your Honor. Charles Barquist from Maschoff Brennan representing Shoals Technologies Group. With me this morning from my firm are Christina Trinh, Kirk Harris in the first row, in the second row Rex Sears, Eric Maschoff and Parrish Freeman. In the third row Jake Israelsen.

Also, from the Sterne Kessler firm Daniel Yonan and Josephine Kim.

Also, here from Shoals are Dominic Bardos, the chief financial officer of Shoals, who is our company representative at the hearing, Your Honor, and also Mehgan Peetz, who is the chief legal officer of Shoals is here.

Thank you.

JUDGE BHATTACHARYYA: Thank you. Good morning.

MR. COYLE: Good morning, Your Honor. Jordan Coyle from White & Case on behalf of the Voltage

Respondents. I'm joined this morning by Yar Chaikovsky, Phil Ou, Bruce Yen, Javi Vasquez, Daniel Trevino, Dave Brooks, Brady Schoenlein, Yolanda Xu, and Sojung Yun.

We are also joined by a number of our client representatives who Mr. Chaikovsky will introduce during his opening statement.

JUDGE BHATTACHARYYA: Very well. Thank you.

MR. SHIN: Good morning, Your Honor. I'm John Shin for the Staff, and with me is David Lloyd and Michael Kachmarik, who is an intern at OUII.

JUDGE BHATTACHARYYA: Thank you. Good morning.

Before we begin, I want to discuss a couple of things. First, regarding the schedule, as you are aware, I have an unexpected issue and I need to conclude the hearing on Wednesday a little bit early, at 2:45. You received an email about adjustments that might be made. I'm not going to go into them now because we just proposed another possible adjustment, but please respond to the emails from my attorney advisor, Ms. Ames. We will not be going extra time today.

Also, there was an objection raised at the pre-hearing conference regarding certain use of deposition designations. As the parties have been advised, that objection is overruled based on Commission Rule 210.28(h)(2), which provides that the deposition of a party

may be used by an adverse party for any purpose.

(Clarification requested by the court reporter.)

JUDGE BHATTACHARYYA: The ruling is also based on my Ground Rule 10.2.1, which contemplates that deposition designations may be used if they fall within the provisions of Commission Rule 210.28(h), and the ruling is also based on the timing of the objection, which was made weeks after deposition designations and counter-designations were exchanged, one business day before the evidentiary hearing, and without sufficient justification with prejudice to Voltage.

Are there any other housekeeping measures to take care of before we begin?

MR. CHAIKOVSKY: No, Your Honor.

MR. BARQUIST: No, Your Honor.

JUDGE BHATTACHARYYA: Then we can start with opening statements.

OPENING STATEMENT

MR. HARRIS: Good morning, Your Honor. My name is Kirk Harris, from the law firm Maschoff Brennan, representing Complainant Shoals Technologies.

It is my pleasure to speak for a few minutes this morning about the evidence that's going to be presented during the hearing this week and why Shoals submits that an exclusionary order should be entered in this investigation

preventing Voltage from importing into the United States its infringing LYNX Trunk Bus products.

But I want to start by introducing Shoals for a few minutes. Shoals is an American success story. Shoals was founded in 1996 by Dean Solon. Dean Solon was a college dropout. Dropped out twice, actually, from college. Didn't have the finances to continue his studies, but as a self-proclaimed gearhead, has a mind for invention.

Shoals was founded in Muscle Shoals, Alabama, and when Shoals was founded, its primary business was to manufacture auto components for the auto industry. And as Shoals began its business in the auto industry, a company approached Shoals called First Solar.

First Solar is a solar module manufacturer, and First Solar asked Mr. Solon if Shoals would manufacture components for solar in the solar industry.

And that conversation and the agreement of Shoals to do that changed the trajectory of Shoals from the auto industry to the solar industry. With that, Shoals, over the years, diminished its manufacturing of auto parts and components and moved to the utility-scale solar industry.

Shoals continued to grow and eventually moved its headquarters to a little town called Portland, Tennessee. Portland is about 40 miles north of Nashville, Tennessee, in kind of a rural farming community. And you can see, the

Google pin that's on top of that building on the bottom is Shoals' current headquarters. That's a building that's about 100,000 square feet of manufacturing and office space.

And recently Shoals has announced that it will be moving its headquarters across the street to the building on the top of the screen, which is a 638,000-square-foot building, which will house offices and manufacturing space.

And Shoals has also announced that in Portland it, over the next five years, expects to increase the employees that are working there by about 500, to take the total amount of employees working in Portland to about 1,400 employees.

Let's take a minute and talk about what piece of the solar industry Shoals moved to. So here we see a photovoltaic system, and just the general structure of a photovoltaic power plant, you have obviously the sun that shines on solar panels. The solar panels convert the energy from the sun into electricity. That electricity gets transported from the solar panels. It gets combined together from various solar panels into a feeder cable. That feeder cable inputs into an inverter.

So everything from the solar panel energy to the inverter is direct current. So that's DC electricity that's being fed into the inverter.

The inverter converts the DC electricity into AC

power or electricity, and that AC electricity then gets fed onto the grid and distributed to us as consumers for homes and businesses, et cetera.

Now there are a few components of a photovoltaic system, and in this case this week we'll be talking about utility-scale power systems, power plants. So we have obviously the solar panels as one element. Shoals does not manufacture solar panels. That's not Shoals' business. That's not the industry that Shoals is in.

Then we have what the solar panels sit on, racking systems. The racking systems are what's commonly referred to as structural balance of system, the SBOS system. Shoals does not manufacture racking systems.

Then what we have is the wiring and componentry to take the electricity from the solar panel to the inverter. So there's wiring that goes on the back of those solar panels. In the industry sometimes that's referred to as the back of the glass, and that is called the EBOS portion of a utility power plant or electrical balance of systems, and that is Shoals' bread and butter. That's Shoals' is there any right there, that EBOS system.

Then, finally, we have the inverter, which, as I've mentioned, converts DC power to AC power. Shoals is not in the inverter business either. Shoals does not manufacture or sell inverters.

So we're really focused in this investigation on this EBOS portion of a utility-scale solar power plant.

So this is Shoals' landing page at its website. Shoals is about inventing simple. Shoals takes great pride and emphasizes in its business developing technological solutions to make power and the generation of clean power faster, safer, and more reliable. In fact, that is Shoals' mission statement, to develop installations faster, safer, and more reliable to reduce the overall cost of electricity.

So when Mr. Solon came into the EBOS world from the automotive world, with his gearhead mind, he saw the current state of how EBOS was constructed and implemented in a solar power plant.

So let's look at that. It's disclosed in the 153 patent. And you'll see here Fig. 1 describes the prior art. This is the state of how EBOS existed.

And so we have our solar panels up here, and you would have a cable or a wire that would collect the electricity from this row of solar modules, and it would transfer that electricity to a combiner box.

Now this is called a home run system, because the wiring is running home to the combiner box. So each wire is running back home to the combiner box.

And what you have here is you would have a wire for each row of solar modules to collect the power and then

run it back to the combiner box. In the combiner box you would open up the combiner box, and you have all these wires coming into the combiner box, and the combiner box would, in simple terms, combine all of the electricity from all of those cables and then output it to a DC feeder cable.

Now there's a lot more that happens in a combiner box with fuses, bus bars, and we'll get into that a little bit more in a minute, but, in a nutshell, you're combining the electricity from all of those home run cables, putting it into a DC feeder cable, and then that DC feeder cable feeds the inverter. That's a home run system.

So what we have in a utility-scale solar power plant, if you were to take, for example, a 100 megawatt power plant, that would sit on 450 to 500 acres of land. So you can imagine if all the solar panels on 450-ish acres of land have a wire coming out of each row, you're going to have approximately 18,000 wires, home run wires, running into a combiner box for that size of a power plant.

And at the time this was all -- all had to be done by licensed electricians. So labor was very expensive, because they had to cut wire, strip wire, connect it, deal with the combiner box.

So Mr. Solon saw this and, unfortunately, Mr. Solon can't be with us during the hearing this week, so we'll have his testimony. He has since, after Shoals went

public, left Shoals to pursue other endeavors and is no longer with Shoals, but his deposition was taken in this investigation.

And he was asked the question, when you saw how they were wiring the solar fields, did you tell them that you thought the way they were doing it was not appropriate?

Yeah, it was cumbersome, it was expensive.

Did you tell First Solar electric that?

Yes, yeah I did, because how they were doing it made no sense to me. When you have a cable that's capable of running 20 amps and you're running 1, it's a waste of money.

So Mr. Solon re-envisioned how to wire a solar field. And one of those inventions that he came up with is expressed in U.S. Patent 8,604,342. Obviously the '342 patent is not at issue in this investigation, but it is listed in the '153 patent as prior art.

And the '342 patent discloses a wire harness system. And the wire harness system, like I say, is disclosed in the background section of the specification, and it's also described in Fig. 2 of the '153 patent. So Fig. 2 is a wire harness 34 that connects to multiple solar panels in each array, the array of solar panels is each block, 32A, 32B, and 32C, so that each array has a single input via a wire harness into the combiner box.

So now what Mr. Solon has done is he has combined the home runs into a single input that can be run to the combiner box instead of individual inputs into the combiner box.

Now, you still need a combiner box in this wire harness configuration, and you still have the DC feeder cable coming out of the combiner box and feeding the inverter.

Of course, disclosing the '342 patent into the '153 background was disclosed, it was a reference cited by the Examiner, it was considered, and the '153 patent issued over the wire harness prior art.

Now that helped the solar industry tremendously by reducing wire, and a lot of wire. But Mr. Solon wasn't done. Re-imagining, as to Shoals' mission statements, a faster, safer, more reliable, cheaper pay to wire, get the electricity from the panel to the inverter.

So let's see what Mr. Solon said about that. He said, prior to the BLA, now the BLA is the commercial embodiment, Shoals' commercial embodiment of the '153 patent. So that's Shoals' product.

So prior to the BLA, you ran DC feeders to a combiner box. And from a combiner box you ran copper wiring to all the strings and brought those strings back to the combiner box using copper.

So my idea was to take the DC feeder and extend it through that solar field in aluminum and doing all the combining of all those strings on the harness itself -- on the BLA itself, versus copper wires, bringing it, taking it to a combiner box, combining it in a bus bar or other fashion within a combiner box, taking it to a fuse, then taking it to a switch, then bringing it out to another bus bar, and then switching to aluminum cabling to get it to the inverter stations.

So in the combiner box, that's all happening, and it was cumbersome, and it was expensive, and you had to have licensed electricians doing it.

The change was this BLA assembly was made in factory under controls and processes and then delivered as a completed unit to just be installed without licensed electricians, but with just general labor, to make it cheaper, faster, safer, more reliable.

So the '153 patent talks about this. The problem to be solved or one of the problems to be solved by the '153 patent was elimination of the combiner box. The combiner box is still a necessary component in known solar power installations. It was in the home run system. It was in the wire harness system. It still is in the home run system and still is in the wire harness system. Those are still systems that are used today, because the energy coming from

solar arrays must be combined going to the inverter.

But as can be seen, there's need for a device that renders a combiner box unnecessary.

So let's go to Fig. 3 of the '153 patent and talk about how Mr. Solon re-imagined, his next reimaging, of getting the electricity from the panel to the inverter.

So, as he said in his testimony, instead of taking the DC feeder cable from the combiner box to the inverter, now you take that DC feeder cable and you bring it back all the way to where the harness is, when the harness is close to the solar panels. So you're bringing that feeder cable to eliminate the combiner box, eliminate all the issues that go with the combiner box.

So you have a harness with the wire that connects into the, in the commercial embodiment, this BLA product, in Shoals' -- you'll hear this week, as the evidence comes in, that this connection is a mold drop.

So on the BLA product you have a mold drop that connects to a wire harness or multiple wire harnesses, and then you have a DC feeder cable that has other mold drops on it to collect the electricity from other arrays. And then you have the DC feeder cable that runs either all the way to the inverter or to a disconnect box, which you'll hear is different than a combiner box, that eliminates all the cumbersome, expensive issues related to a combiner box.

So what does Voltage think about this? Well, Voltage agrees, yeah, a Trunk Bus, which is a generic name for the products encompassed by the '153 patent, the Trunk Bus can eliminate the combiner box. How does it eliminate the combiner box? Well, in our design the Trunk Bus can go up to a thousand MCM. MCM is the size, the circumference of the cable that DC feeder cable, okay.

So it can go up to a thousand MCM, which can carry more than 400 amps of the current. So usually combiner boxes can handle 400 amps. So with that Trunk Bus to be utilized in the solar industry there is really no need for the combiner box anymore. Voltage agrees.

So what happened next? After Mr. Solon re-imagined the EBOS industry and how to get the electricity to the inverter, Shoals was having great success. In fact, Shoals, as I briefly mentioned earlier, went public in January of 2021. Shoals began selling its BLA product in 2016. And with that great success that Shoals was experiencing, often comes knockoffs, and that's what Shoals has experienced with Voltage.

So Voltage is headquartered in Ningbo, China, and it has an office in North Carolina here in the United States, but, really everything happens in Ningbo. The products are designed in Ningbo. They are manufactured in Ningbo. They are exported in Ningbo. Even priced, I

mean, their director of sales, Gary Joseph, when asked, well, how does Voltage determine the price that it charges for LYNX Trunk Bus? He is not involved in the pricing. Who is? Well, a team of people put together the proposals and those people are the design team in Ningbo.

So Voltage is really the opposite of Shoals, Shoals being an American-based company, Ningbo a Chinese-based company that imports its products into the United States.

Now, Your Honor, my next slide contains some CBI, so I would ask that we go on the confidential record for this next slide.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving back to the public record.

MR. HARRIS: And not too long after Voltage imported its first product, excuse me, LYNX Trunk Bus product into the United States, it filed for its own patent on the Trunk Bus. In fact, it filed its application in July of 2022 to try to cover its product, and, interestingly, it filed an IDS shortly after the application. The only reference cited on the IDS was Shoals' '254 patent.

So what does this tell us? It tells us, one, Voltage also believes that there's inventive concepts with the Trunk Bus, two, Voltage knew about Shoals and Shoals' BLA product, because it knew about Shoals' patent, at least at the time of the filing of this application. And so what we have here are, in this investigation, you'll hear from the Respondent Voltage that, well, you shouldn't even have a patent. Shoals' patent is invalid, shouldn't even exist.

Well, Voltage obviously thought this was an inventive concept, they filed their own patent application on it, one, and, two, they knew about us.

So let's now move to is Shoals entitled to relief and, if so, what relief. The two questions that need to be answered in this investigation.

And we can break down, of course, that first

question into some subparts. Voltage's products practice the '153 patent, are the claims that Voltage practices valid, and does Shoals have a patent-practicing domestic industry.

So we'll take those one by one. First, with the first question of do Voltage's products practice the '153 patent. So let's use as an example claim 1 of the '153 patent. You'll hear from Shoals' expert, Bill Brooks, later this week about all of the asserted claims. We'll run through claim 1 as an example here.

So claim 1, a lead assembly for use in a solar energy installation. A drop line terminating at a drop line connector. Let's talk about that for a minute, a drop line terminating in a drop line connector.

So here we have a portion of the specification of the '153 patent that identifies each drop line 12 highlighted there in yellow, terminates in a drop line connector 13, and that drop line connector connects to a wire harness 35.

So you have, again, what Shoals calls as a mold drop on its BLA product, several mold drops on the entire BLA product, and then coming out of each mold drop you have a drop line and a connector and each connector connects to a wire harness.

The '153 patent also talks about those drop

lines, how does it talk about them. So the joint, the mold drop 17 there of lead assembly 10 may include a single drop line, which is shown in Fig. 30, over here, or dual drop lines, as shown in Fig. 29, corresponding with connecting to a single wire harness or two wire harnesses respectively.

So we know that in the two drop line embodiment, this drop line is one, and it goes and connects to a wire harness, this drop line is a second one, two drop lines, 1 and 2, this goes and connects to a different wire harness. The wire harness that was discussed in the '342 patent that's prior art.

So let's look at the claim again. So we have Voltage's LYNX Trunk Bus product where we have a feeder cable shown here that passes horizontally through the mold drop, and we have drop lines. Each drop line terminates in a connector. I don't think there's any dispute about the drop lines terminating in connectors in this investigation.

And then, Your Honor, with my next few slides, again, we'll reveal CBI, so could we go on the confidential record, please.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving to the public record.

MR. HARRIS: Thank you, Your Honor.

Let's move and talk about the other attack on the validity of the '153 patent. Let's first deal with the Shao reference. The Shao reference is not analogous art. So, as we know, to rely on a reference for obviousness the art must be analogous. So it has to be in the same field or endeavor and it has to -- or I should say -- or it has to be pertinent to the problem faced by the inventor.

So let's deal with, is it the same field of endeavor. So Voltage's own alleged invalidity expert, Dr. Kenny, says the field of endeavor of electrical systems for solar power generation is the field that we're dealing with.

Well, we've discussed it, the '153 patent deals with the EBOS section. Shao has nothing to do with solar. In fact, if you read the Shao reference, it doesn't mention solar once in the entire reference. It's not even in the same field.

So, one, it's not in solar; two, what Shao deals with is the distribution of power in buildings. So we're talking about taking power and distributing it to a building.

What does the '153 patent deal with? Well, we've talked about it. It deals with aggregating power, combining power without the use of a combiner box.

So, two, it's not analogous for that reason, because it's a different field of endeavor, and, three, Shao focuses on AC power, and we know that the '153 patent is dealing with DC power. The Shao patent, there's no reason that anyone who is skilled in the art would combine the Shao patent with the Yamawaki. Once you get rid of the Shao patent, because it's a different -- it's not analogous art, but before I get to that, I'll address that it's talking about a different problem as well.

So the Shao patent, again, is using a branch cable system for power distribution, whereas the '153 patent, the problem is connecting a solar panel array to inverters without the need of a combiner box. It's two different problems to be solved here.

So that's nonanalogous art. And once you get rid of Shao, the obviousness argument goes away because Yamawaki can't stand on its own.

That being said, let's look at Yamawaki and see what it discloses. I think we've seen this before. Yamawaki discloses nothing more than a wire harness. It discloses joints, green dots, a trunk, and branches to distribute that power. We're using a wire harness to

collect power, but Yamawaki or, yeah, Yamawaki has the same functional structure as the prior art that we've already -- we've already addressed that in the patent.

So the obviousness argument and the anticipation arguments should not stand in this investigation. That being said, we have more.

We have objective indicia of non-obviousness. If they -- if somehow Shao and Yamawaki could pass the clear and convincing test and the analogous art test, well, the BLA product has been life changing and industry changing for these solar power plants and how they are installed and the money that it saves and the time that it saves and the labor that it saves and the safety that is introduced by using what Mr. Solon invented.

In fact, Shoals even was awarded by PV Magazine, which issues awards every year to the top products in the solar industry, an award for its BLA product, because it was revolutionary and is revolutionary. And you'll hear more about that this week.

So having shown, as Shoals submits, that the patents -- that Voltage infringes the patent and the patented claims, that the claims are valid, does Shoals have a practicing domestic industry.

Well, we don't need to take a lot of time here. The same argument that Voltage is using to say that Voltage

doesn't infringe is the same argument that Voltage is using to say that Shoals doesn't practice the partially -- the aperture extending partially through the undermold argument. We've already dealt with that. I won't rehash that issue.

Technical domestic industry is met in this case. Let's move to economic domestic industry.

The Respondents agree that no one disputes that Shoals is an American-based company that manufactures products in the United States. Shoals, as a matter of fact, doesn't manufacture any products outside of the United States. And it only manufactures its BLA product in Portland, Tennessee.

So Shoals has invested and the evidence -- the evidence that comes in this week is going to show that Shoals has invested significant amount of money in plants, equipment, labor, capital in manufacturing, developing the BLA product.

So Shoals submits that the domestic industry requirements have been met in this investigation.

So now we can talk about the relief. Let's talk about, should an exclusion order issue in this case, what Respondents Voltage has asked for.

Voltage has asked that the effective date of any exclusion order should be delayed to permit Respondents to deliver products to customers under contracts entered into

prior to the target date.

Shoals posits that this cannot and should not happen. Because what happens on these projects is, you can enter a contract, and then the project, the solar project, can get delayed, it can get -- it can get pushed, you know, it's three years down the road, and what Voltage is asking is, look, if I can hurry and run out and sign a bunch of contracts, because the business plan is you sign a contract, there isn't inventory for these things -- you'll hear through the evidence that each project is custom. Everything is custom-made.

So you enter a contract. You start -- you send it back to Ningbo, China, the product gets made, and then it gets shipped. I mean, that could happen six months, a year, 18 months, two years in the future. They should not, because of their business plan, be able to, should an exclusionary order issue in this case, delay the repercussions of the exclusionary order by continuing to import products for contracts signed at the target date. We'll address that fully in the briefing but wanted to mention it here so that Your Honor was aware of the issue.

Bonding. Shoals is going to ask for 100 percent bond in this investigation. As you can see from Voltage's testimony, and as I mentioned before, these projects are custom. How do you price them? Well, it's all custom, and

so there's no uniformity. Our own witnesses have testified the same thing. It varies. The price of these products varies. Again, the product is not just the drop. The product is a whole line, the feeder cable line with many drops on the line. And as you design these utility solar plants, depending on how the panels are laid out, each product is going to be a little bit different.

And so there is no uniformity on pricing. It is custom. And, with that, Shoals will seek a 100 percent bond in this investigation.

Finally, I just want to introduce the witnesses that you'll hear from Shoals' side. First, you'll hear from Ben Macias, Shoals' chief revenue officer. You'll then hear from Jeff Tolnar, Shoals' president. Then we'll -- I'll introduce a couple of our experts here. You'll hear from William Brooks or Bill Brooks, and he will be testifying about infringement and tech DI. We also have an expert Josh Weiner, who -- both Mr. Brooks and Mr. Weiner are industry experts, and Mr. Weiner will address validity issues.

You'll hear from Shoals' corporate representative also, Dominic Bardos, the chief financial officer for Shoals, and Clarke Nelson, Shoals' economic DI expert this week. Those are the witnesses that you'll hear from.

In sum, Your Honor, this investigation, from Shoals' perspective, is actually quite simple. I think what

you'll hear from Voltage is trying to confuse issues, trying to muddy the water, but I think, as the evidence comes in this week, you'll be able to see that the investigation is pretty simple. The infringement case is simple and straightforward. The validity case is simple and straightforward. The domestic industry case is simple and straightforward.

And, with that, Shoals submits that an exclusionary order should be issued in this investigation.

Thank you.

JUDGE BHATTACHARYYA: Thank you.

OPENING STATEMENT

MR. CHAIKOVSKY: Good morning, Your Honor. Yar Chaikovsky from White & Case. It's an honor and privilege to be before you as well as to represent my client Voltage in this investigation.

Your Honor may recall back in the Markman hearing in December that we introduced our clients, but I will introduce them again here. In the audience we have Li Wang, if you can stand up. Thank you. We have Ruiyan Ge, also stand up. They are the founders of Voltage, Your Honor. You will hear from Ms. Ge later this week. She will be our corporate representative.

We also have Jurgen Krehnke, president of Voltage. And we finally have Michelle Pang, in-house

counsel.

And, Your Honor, I'm proud to represent Voltage in this investigation. And you've heard we have various members of our team here in addition.

One thing before I begin my opening statement that I've prepared, I just want to focus Your Honor on the crux of the dispute as you listen to my opening statement this morning, or at least the crux of one issue as what I heard.

And I think it's really pertinent. What I heard from counsel and what I saw on slide 35 is their argument, right, their infringement theory, their technical domestic industry theory, which has been a moving target in this investigation, just like the other two patents that are no longer here, equates to one of their arguments is that the number of drop lines equals the number of apertures, Your Honor.

We know that can't be so. That's wrong. The key here is that the claims from the prosecution, from the provisional application in 2014 until issuance of this '153 patent just in 2023, when it was added to the amended complaint, had the words added by the Examiner, then carried forward, that the apertures must extend completely through or partially through. And those words must have meaning. This is patent law.

If you were to believe what you just heard from Shoals, that is drops and feeder cables in the solar industry, that they exist and that they necessarily meet these claims because they only need to show that there's drop lines and there's two drop lines, Shoals' position devolves into those structures necessarily are completely through via feeder cable or partially through if I have a drop line. As a matter of law, that's wrong. Words in a claim must have meaning. Completely through or partially through have meaning. All I ask is we just consider that as we go through this opening statement.

Your Honor, Shoals is headquartered in North Carolina. Ms. Ge and Mr. Wang founded Voltage -- sorry -- Voltage, I apologize -- Voltage over eight years ago. Ms. Ge began her career in the U.S. solar market working for a large solar panel manufacturer. Mr. Wang had significant experience working with cable assemblies in various industries, not just solar.

In forming Voltage, they combined their experience with a vision to do their part and to help create a clean and energy future.

As you can see, Your Honor, for example, one of their slogans you will see on the internet, connecting today to power a better tomorrow. Voltage does this by customizing and manufacturing wire harness solutions used in

solar installations, often utility-scale obviously.

What do these solutions include? They include cables, Your Honor, as you can see here, and those could be big and small, made of aluminum or copper, conductors used to carry electrical current generated from solar panels.

And they have connectors, what we're hearing a lot about today, for example, the Voltage LYNX. We called them assemblies, harnesses, joints, junctions, Your Honor. In the end, we're talking about taking two or more conductors and connecting them to the electrical current combined together. There's nothing unique about that electrical connection in the solar industry versus any other industry.

In fact, as we see here, we have an animation, like water from two streams flowing together. They flow into a larger stream. Or you could have three larger streams flowing into a river. Similarly, these are basic electrical components that have been known and used ubiquitously in industry and applications for decades.

As us can see on the right, solar panels connecting together to deliver energy. It's just connections. It doesn't matter whether those connections are residential. By the way, the claims don't have utility-scale in them.

So what's the differentiator? The Voltage way

provides customers with a full service, customized approach to every solar site project. That's the difference. And engineering team dedicated to working with customers to design the best solution for every project. Every solar site is different. Every project is different. You have to do 3D renderings of projects in order to deliver them. That's not patented. We have to leverage virtual reality as we deliver and train people on site to familiarize themselves with installations.

It's that personal approach that Voltage takes for each project that carries over into all facets of their business.

In fact, as we see here in the lower left, in 2022 Voltage won an award from Solar Power World, you can see down below, and it was a leadership in solar energy for components. Voltage is proud of this award.

And on the right-hand side, Your Honor, you can see Voltage actually, the data from the 2022 projects, 57 projects, and delivering over 7 gigawatts of clean energy.

Now this is in 2022. Why is that relevant? It's this success that's contradictable what's happening at Shoals at the same time. We have to then consider what's the purpose of this investigation.

As Your Honor will hear from Shoals in this hearing, Voltage's rise and success did not bode well for

Shoals. Shoals had gone public in 2021. Its CEO and founder, as we just heard, will not be here, Dean Solon, who is the inventor on almost every Shoals' patent, including the '153, and its parent, the '254, no longer in this investigation.

He retired and cashed out. He won't be here.

Well, again, given that success that you saw on the last slide, all right, Shoals needed to take action. Ben Macias, Shoals' chief revenue officer, and who will take the stand later this morning, or today, convinced a common customer to give him this Voltage product that I'm holding in my hands, Your Honor.

He analyzed it, CPX-40. He cut it open. He made the determination that Shoals, that Voltage, excuse me, had copied Shoals' BLA product. It was infringing its patents, plural.

Now Shoals' then-interim CEO at the time and current president Jeff Tolnar will also testify in this investigation. He explained during his deposition, as you can see, we chose to file because we believed there was infringement on our patents. More importantly, given what we saw with the success of Voltage in 2022, Your Honor, we were being commercially hurt in the marketplace and also ongoing from a price standpoint.

And so, Your Honor, at this moment what you saw,

if you were to look, for example, in the financials of Shoals, they filed this investigation, their stock price went up for a moment and it's dropped down. That's been the impact. They are not performing well. And that's why they filed this investigation. They got a boost after they filed this investigation, but, after they got that boost, it's gone way down. Some suggest it's because this investigation isn't going so well for them.

Well, Your Honor, they filed this complaint at the ITC, and you can see where Shoals, in May 2023, they filed it with respect to three patents -- well, two patents, excuse me -- the '739 patent was filed against Voltage in-line fuse and string harness products, that's the second one, Your Honor, right here. And the '254 patent, also on the right, that was filed against Voltage's LYNX Trunk Bus products. Both those patents are gone. Shoals overreached on the '739. That's going to be important, Your Honor. They believed it covered zero connector in-line fuse assemblies.

But that wasn't so. They petitioned for review of Your Honor's Markman decision and motion for -- order on the summary determination last week. We'll let the Commission deal with that now, but that's important, because, just like we heard, two drop lines necessarily equals infringement. That's not true. Just like this

patent didn't cover zero connectors.

Shoals overreached on the '254 patent, Your Honor. They believe that apertures could be parallel by just looking at any little sliver of an aperture in the mold. That was their position. It's what they allege in the complaint and argued to Your Honor at the Markman. After the Markman order, not so.

So what happens? They stipulate to dismissal of the '254 patent.

And so this is still relevant, Your Honor, this week, because you'll see and hear how Shoals overreached, and it's this misperception about the scope of its patents and its infected domestic industry claim, regardless of the determinations Your Honor and the Commission make about infringement, there can be no violation because they have overreached even on domestic industry, both technical and economic.

I'll preview that further before I sit down.

Now because those two patents disappeared, we're left with what, the amended complaint, filed in May of 2023, and the '153 patent. Note on the '153 it was filed in 2021. It issued in June of 2023.

And so it was added late into the case, actually, so that's the filing date, sorry, May was the filing date of the original complaint, but it issued and after that they

added the patent to this investigation.

For Shoals, while some of their BLA configurations may practice the '153, they have overreached and they said all their BLAs practice. They do not. Thus, they cannot meet their burden on domestic industry. They have already admitted they counted investments in nonpracticing products. And by Commission precedent, there cannot be domestic industry.

In fact, as we see here, Your Honor, on the left-hand side in the Shoals' motion for summary determination, they took the position over here, Your Honor, that the -- we focus on the one and two drop products, simple arithmetic suggests one drop, which can't be covered, because we need two drops in the claim, account for less than 20 percent or likely much less. So even if it were reduced by 20 percent, it's still substantial.

Okay. Later in their pre-hearing brief, all attorney argument here, there's no citation, right, don't see any support for this, just make up a number, 20 percent. Okay. Pre-hearing brief, may be slightly different. But I don't know that it is different. They argue that Shoals' calculations include investments in BLAs that have with us one drop. They admit that. This is true. It may be true -- it is true. We know it's true.

And now they say it's immaterial. Well, I don't

know. Is 20 percent or less, attorney argument, it's immaterial, attorney argument, no citation. All right. Why is that? It's a problem. Certain Subsea Telecommunications, a Commission Opinion, Xtera proffered an allocation in that case between products that practiced the patent and products that didn't, just like here, and that lacked the support of substantial evidence as it consists of solely attorney argument, just like here, no evidence, just like here, no evidence. It's immaterial.

And so, as a result, Your Honor, despite U.S.-based manufacturing, they can't establish domestic industry for the '153 patent in this investigation. That should end this investigation.

Your Honor, I'm going to introduce you briefly to the rest of Voltage's witnesses along the way. First, addressing noninfringement and the technical prong for domestic industry, you'll hear from Dr. Kimberly Cameron. If she can please stand up. Dr. Cameron.

Dr. Cameron, as you can see here, Your Honor, is a licensed professional engineer and a principal at ESI or Engineering Systems Inc.

Dr. Cameron received her BSEE in mechanical and aerospace engineering from Princeton and both her masters in mechanical engineering and Ph.D. in mechanical engineering from Stanford University. Unlike Shoals' technical experts,

Dr. Cameron actually analyzed the claim construction briefing and record in this investigation in forming her opinions. She focused on the claim terms that matter, as I started my statement.

And, Your Honor, I want to take you back to the Markman hearing, because it's a critical issue that could streamline the issues, just as I started. Dr. Cameron will discuss this in more detail.

Now this actually, Your Honor, you'll see an excerpt from your Markman order, which hones in on a key dispute: How to determine where drop line apertures terminate. In particular, this may be relevant to scenarios, you'll recall, where multiple drop lines apparently are comprised of a single cable.

And that's obviously important for mold structures with an aperture that extends partially or completely through a mold. Got to keep our minds on those terms.

And so as this was being discussed, both at the Markman hearing and mentioned in your Markman order, Your Honor, you may recall that Staff explained his test for determining whether an assembly has a mold. Remember, the claim is to a mold with three apertures. It's not to drop lines, it's not to feeder cable. It's a mold comprising. And a mold comprises these apertures that extend partially

through and completely through. It's not two drop lines and we win.

So Staff explains this test as focusing for determining whether an assembly has a mold with aperture structures that extend completely or partially through the undermold. And, in fact, we see here, Staff would consider the path of the drop lines as it continues under the compression lug, and if it continues even past the lug, out the other end, to create a second drop line, then Staff would consider the entire cable, the entire cable pathway to be a second aperture pathway.

In fact, we see that in Staff's amended proposed constructions, entire pathway when viewed -- I guess I'd like to note this because this is part of your construction which Shoals didn't show during their opening statement -- when viewed as if the drop line wire or drop line were removed.

All right. We didn't see that. And Your Honor agreed with Staff that the proper construction here, when we're looking at apertures that are continuously or partially through, they should be considered as the entire pathway. And in this demonstrative figure is what we're talking about.

At the bottom we have one cable, the big one, the feeder cable, creates in the mold structure a first aperture

that extends completely through. This happens in a mold structure in orange or whatever color you want to say this is. Obviously, and here is a compression lug or some form of, you know, electrical connection inside the nexus. And then even at the top you have -- it could be a feeder cable, Your Honor. Sorry. Excuse me. A drop line, Your Honor. And the mold structure's second aperture that extends completely through. In both instances, when we look at this, those apertures, when we remove the cables, extend completely through. Seems very clear.

And, again, this was discussed at the Markman hearing. We had various figures we placed up. Well, what did Shoals have to say about that at the hearing?

Your Honor, we heard from Shoals' counsel -- by the way, Shoals' counsel is also the counsel that prosecuted the '153 patent, not the '254, but the '153 -- different lawyers perhaps but the same firm -- we've heard from Shoals' counsel mischief. Fig. 7 is mischief. Don't look at Fig. 7. In fact, it's not a blueprint. It's not a diagram. It's not a manufacturing specification.

In fact, there are lines being drawn hither and yon. Ignore Fig. 7.

Well, that's kind of interesting, because the only cross-sections in the patent that actually show you the inside of the mold structure of what is partially through

and completely through, either done by the Examiner of the '254 or eventually the Examiner that's carried over in the '153, Fig. 7 in detail, and, frankly, Fig. 6, which has a lot of small ones together, none of those figures shown by counsel for Shoals will show you the inside of the mold structure. You can't tell from the description or the six prongs whether the mold is partially through, completely through. You have no idea.

So, Your Honor, Dr. Cameron will show you, because she analyzed the file history and considered everything from the provisional to issuance as well as the arguments made in the Markman and addressed them in her report, there's no mischief. She walks through Fig. 7 and she will walk through it in her testimony, and what it means for a feeder cable to be completely through and a drop line to be partially through, as we see here in Fig. 7, because, again, this is the only detailed cross-section. We also have it in Fig. 6, you can take a look, but this is the detail.

And you know what's interesting, what wasn't shown by Shoals at the Markman hearing and not shown today is they said -- we just heard mischief, not a diagram. It's not a schematic. What do I have here?

Your Honor, this is the provisional application for the '254 and '153 patents, RX-96. I have a hard time

with this pointer.

And in this provisional application are the record, what does Shoals show you -- Shoals. It's actually their document. They submitted it as a provisional, stamped all over, I've got it right here in my hand, Shoals on almost every page. Typical joint detail. Remember, I told you, this is about joints, connectors, typical joint detail.

And I blew it up right here on the right. Looks like Fig. 7? Sure does. Not mischief. It's actually Shoals' structure. And we have a feeder cable completely through, drop line partially through. And that's even part of the intrinsic record, Your Honor.

I've got it right here. We'll talk about it later. It's all Shoals' documentation sitting here in RX-96, which is part of the file history. Now there I can actually see a cross-section, and I can see, unlike those figures that were shown to you by counsel for Shoals.

And it's not just that, Your Honor. Your Honor, Dr. Cameron will also show you these internal design drawings from Shoals that were evidence that Shoals relied on for conception or reduction to practice in this investigation. So this isn't part of the file history, but they did rely on these for conception and reduction to practice for both patents, including the '153.

And in relying on this RX-279C document, what

does it look like again? It looks like Fig. 7. It looks like the provisional application. In fact, it might be almost identical to the provisional application. It makes sense they would rely on it for conception or reduction to practice.

But they did. So Fig. 7 can't be ignored. It's not mischief. It's part of the Shoals' overreach. Just like the other two patents no longer in this investigation.

But, Your Honor, it's more than just Fig. 7. As you recall, you asked Shoals about the Staff's entire cable test during the Markman hearing and the scenario where a single cable forms an entire pathway in the mold that goes all the way through.

We see here in the Markman transcript on page 208, lines 9 through 25, Your Honor asked Shoals to explain how their approach differs from Staff's. That's your question.

And Shoals explained that -- right here -- Staff is requiring that the pathway start at the outer surface of the undermold. We disagree with that. We think it starts at the nexus or the compression lug. So it starts in the middle.

But, importantly, they said the concept of a pathway is very useful. It's a pathway for the cable through the mold. It's as simple as that. I agree. A

pathway for the cable.

It seemed like Your Honor wondered, isn't that Staff's test, right. Your Honor responded: Right. That's how Mr. Shin was looking at partially or continuous. He was saying let's look at the cable. Does the cable stop in the middle or does it go all the way through? That seemed to be his test.

What is Shoals' explanation? The cable, when it's at the compression lug, it essentially ends before it's crimped at the feeder cable. So there is really no longer a physical pathway at this point.

So now we have the disappearing pathway test, crimping and it goes away, effectively, as a physical matter, there is no longer a pathway. The drop lines, which are crimped up against it or compressed up against it and effectively no longer exist as a physical pathway.

Your Honor followed up. Do they exist as a physical cable or not? What did Shoals say at that time? Whether it's two wires coming in and meeting more or less in the same area or not or whether it's one wire that's compressed -- we know it's not two wires -- either way, again, in reality, the wire no longer has a physical pathway. It is compressed right up against the feeder cable to make the connection.

That's what they argued at the Markman hearing.

I didn't hear any of that today.

So we had the disappearing pathway test at the Markman hearing from Shoals. We'll see what we hear in this investigation. But this theory may not be there. That's going to be important too.

Your Honor, with this next slide, actually we should go on the confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving to the public record.

MR. CHAIKOVSKY: Your Honor, as this claim language was proposed and added by the Examiner to put the '245 patent claims into allowance, these 113 words, magic words. The claim mold. The added apertures, extending partially or completely through. These structural characteristics of the mold were required to get over the prior art. The claims wouldn't have been allowed.

This is April of 2020, COVID time, right. Remember, provisional was filed in 2014, six years of prosecution and rejection and rejection and rejection. And the Examiner finally, again, with the only cross-sections he's got, Fig. 7, Fig. 6, the provisional with Shoals' documentation, adds these 113 words to put the claims in allowance. They can't be meaningless.

By the way, Shoals then carried over this language, their choice, of partially through and completely through into the '153. And that was actually counsel sitting at this table in terms of the same firm. Sorry. Apologies there, Your Honor.

And so, Your Honor, we showed this demonstrative Markman, right. That Examiner -- it's important -- right, the claims existed much in the way that I think they would

envision them today, right, which is drop lines and feeder cables. This is, again, the '254. And in order to get the claim their prosecution counsel at the time amended it and included everything that the Examiner proposed.

So this 113 words were added to the mold structure, right, the claimed undermold in the '254, it was part of the file history. Claims were allowed and the '254 patent issued. Now these claims do have this parallel limitation that was part of the Markman, and there could be no infringement based on that, and Your Honor's construction. The '254 was dropped, but this is all part of the file history that's relevant to the '153.

So what happened next? Again, this is really important, Your Honor. We have the '254, and it issues here in April of 2021. Just prior to issuance, of course, they file a continuation claim, right, a couple weeks before, April, 8, 2021, of the '153.

And so that's claim 1. Again, we have an undermold structure, that fully encases the nexus, this is a different limitation, the undermold comprises. We have this mold like I'm holding here in RPX-52. And what they tried to get, right, two apertures. The first aperture goes completely through, the second aperture partially through. You don't see a third aperture. But, importantly, you also see these limitations of completely through and partially

through. They didn't just claim drop lines. They didn't just claim feeder cables. Two drop lines isn't sufficient. Two drops isn't sufficient. We can get into that also.

So after they attempted to get this broad claim, this they don't get, as we know, the claims don't exist in this fashion, on the right-hand side of slide 27, what was happening? Well, 14 dependent claims in this set off of claim 1. One of those, by chance, Your Honor, had a third aperture extending partially through the undermold and having a third diameter different than the first diameter. That's carried forward also from the '254.

That's dependent claim 10. Again, why is that relevant? It goes to the explanation that they keep saying, hey, let's go look at Fig. 32, 29. They're trying to get claim 1. Claim 1 is Fig. 7. Claim 1 is the prosecution -- sorry -- the provisional application, Shoals. Claim 1 is their internal schematics that they rely on for conception and reduction to practice -- not mischief. It's actually what they are trying to patent. We want further breadth. It's only until I get to claim 10 that they add a third aperture.

So some prosecutor actually thought about a third aperture. Do I know what supports this? I don't know what supports this. Recall, we have a specification that's six columns long, and that's being generous. It uses the word

aperture once. But that's for disclosing zip lines, and that's not helpful. There is no definitive evidence as to what the Examiner had in mind when proposing his amendment for aperture extending partially through.

And the third aperture extending partially through could have taken this exposed wire, for example, that you have in Shoals' own documentation from the provisional application. And the product application, and it could have, for example, added a second drop line, I guess, because that's a cross-section, just like we have the zero connector not disclosed in the embodiment of the '739. I have to envision how I have the second drop line extend partially through because there is no image of the undermold other than Fig. 7 and Fig. 6 in this patent and also the provisional application.

The intrinsic record doesn't tell us more. We don't know more.

So, Your Honor, ultimately, again, kind of what I saw during opening is ultimately important, right. I don't have a cross-section of this device. I have no idea whether these extend partially through, completely through this mold structure. Is this undermold-overmold? Nor on their slides, do I have anything here that tells me, here's the inner mold, how is that made? I don't know. There's no disclosure. They didn't point to any.

And I thought it was interesting that they didn't point to any cross-sections. They didn't point to Fig. 7. They didn't point you to anything. Attorney argument consistent with what we've had throughout this investigation.

We do know, Your Honor, to determine whether we have a mold structure with and aperture that extends completely or partially through we need to look at the entire pathway of the cable. Dr. Cameron did that. Mr. Brooks did not. There's no infringement.

And so, again, the key here, as I started my opening statement. Is that these words apertures extending completely through and partially through must have meaning. You can't read them out of existence. Words in a claim have meaning. Their interpretation as a matter of law is incorrect, because here's the issued claims of the '153. We have the mold, first aperture, second aperture, three apertures. These products have two apertures at best, as we can understand aperture. And, frankly, they can't show that any extend partially through. Can't inherently be there. Otherwise, the claims wouldn't have all those limitations, Your Honor.

Now, Your Honor, we'll go back to the domestic industry. There's no domestic industry. Some of Shoals' BLA products, as I said, may practice the '153, but

certainly none that Mr. Brooks analyzed. Shoals' lawyers gave him a single BLA product to analyze and cut open, quad-drop BLA. That quad drop has one big cable, two small cables. Each small cable forming two drops that extend parallel to the feeder cable. No disappearing pathway. No partially through. They don't practice. Other BLA configurations may.

Here's a -- this is obviously the feeder cable, Your Honor, and here's, you know, you have the one cable goes all the way through, the other cable goes all the way through, as I already showed you earlier. And so you have a four-drop product with two cables for the feeder cables. No dispute. Cables go all the way through. No disappearing pathway. No apertures partially through. No ending hole. They don't practice.

In fact, Mr. Nelson, Shoals' economic DI expert, countered all of Shoals' investments, as we noted, related to BLA without actually allocating for ones that practice or not, even including one-drop BLA, which you can't practice. They clearly don't have three apertures. Indeed, Mr. Brooks didn't even discuss with Mr. Nelson whether certain BLA configurations practice or not. Mr. Nelson just assumed. He assumed wrong.

Now listen closely today and perhaps tomorrow, given Mr. Brooks' failure, I assume that Shoals may try to

expand on its 30(b)(6) testimony in order to save their case. Neither Mr. Macias or Mr. Tolnar should be allowed to do so as there is no evidentiary support for this.

Your Honor, you will also hear from our rebuttal expert on economic DI, Mr. Andrew Clarke. He will come on, I think, right after Dr. Cameron.

Mr. Clarke, will you stand up? Thank you.

And he will testify on their deficiencies and why Shoals cannot meet its burden on economic domestic industry.

Mr. Clarke, as you can see, Your Honor, his qualifications and pointing out that he has been involved in over 40 ITC investigations addressing domestic industry, and even in the past year has testified twice before Chief ALJ Cheney.

Finally, Your Honor, you will also hear from our expert Dr. Thomas Kenny.

If you could stand up, Dr. Kenny.

He will be testifying on the invalidity. Dr. Kenny has been a professor in the department of mechanical engineering at Stanford for over 30 years. He received his Ph.D. in physics from Cal Berkeley. He may have torn allegiances across the Bay.

Your Honor, as you're aware from Shoals' Daubert challenge of Dr. Kenny, by a motion in limine, Shoals challenges Dr. Kenny qualifies as a person of ordinary

skill. They want to leverage the Kyocera decision where the Federal Circuit found that the ALJ abused his discretion by allowing Kyocera's expert to testify when he did not have the skill of ordinary -- one of ordinary skill.

We will proffer Dr. Kenny as an expert based on his education and experience, as you see. Shoals is attempting to craft an overly narrow definition of one of ordinary skill in the art, similar to that adopted in Kyocera, which required a combination of degree in mechanical engineering and, depending on the degree, a minimum number of experience, years of experience, in power design. Kyocera chose not to contest that definition. Very different in this situation. And its expert admitted he had no experience. The circumstances here are very different.

The evidence here will show that Dr. Kenny meets that of ordinary skill and Shoals is overreaching as well as its argument about what is analogous art. You'll recall back at the Markman hearing the parties just said there was no dispute with respect to claim construction. We'll be hearing this week there is on the issues of invalidity.

To streamline the presentation, Voltage has narrowed its prior art invalidity grounds to two. We heard about this earlier this morning. We'll also have some 112 arguments, but focusing the prior art on two.

There will be the 2012 Shoals wire harness,

commercial embodiment. Dr. Kenny will explain, and you can see here obviously, this being available, predates the filing of the patents. He will explain that under Shoals' broad infringement read, you just heard it, two drops necessarily have two apertures, Your Honor. That's their view of the world.

Well, if any drop necessarily has an aperture that extends partially through, that's no different than Shoals' wire harness that it sold for years before its BLA, or the priority date of the '153 patent. Shoals refers to its BLA as a lead assembly. Just bigger. Even its provisional application, if you'll recall, we showed during the Markman, and you'll see it later in the specification, it just says, it's a wire harness on a larger scale. We actually saw the figures from the patent. You just take these joints, right, and make them larger and connect. It's the same notion, basic connectors.

I thought it was kind of interesting. We were hearing some issues about, you know, this is photovoltaic, you know, analysis. We got to the focus on the solar industry, Your Honor. The Examiner sure didn't do that. The Examiner looked at art in all sorts of fields with respect to the cited references. Not limited to solar. The Examiner has got art that's in various fields.

In fact, as I was sitting there and listening to

the opening statement, two classifications for this patent have nothing to do -- there's one that does -- but the second and third classification of this patent have nothing to do with PV, solar. You know what those two are? This is what I wrote. Electrically conductive connections, generic, of any kind. That's how the U.S. Patent Office has classified this patent, electrical connectors. Yet they want to claim Dr. Kenny is not of ordinary skill. He is beyond one of ordinary skill, Your Honor.

In the end, this patent, again, is about connecting cables or wires and protecting them with molds. It's been done for decades in different fields and it was done in utility-scale PV installations for years by Shoals itself before the '153.

Finally, Dr. Kenny will opine on the combination of Yamawaki and Shao. Yamawaki, no one is going to dispute, PV, it's in the title, photovoltaic. It's a solar installation reference.

The file history actually shows that Yamawaki was considered by the Examiner. That's one reference that was considered and the claims were allowed over Yamawaki. Remember, Your Honor, though I showed you the claims, right. Claim 1 of the '153, we had dependent claim 10. Well, one of the main reasons they didn't get that broad claim without the third aperture, Yamawaki. They had to accept claim 10

with the third aperture extending partially through to overcome the art, including Yamawaki.

And so the claims were allowed, because the applicant relocated the claim limitation involving that third aperture extending partially through from the dependent claims to the independent claim, following the Examiner's suggestion, again, just kind of like they did in the '254. They didn't have to follow the Examiner's suggestion in that patent or this patent. They did.

So Yamawaki was only overcome for the limitation of a third aperture that limits to a second drop line. Okay. I think that's important. So Yamawaki has got everything in the claims, anticipates everything, except for that third aperture. That's what makes Shao important. I just showed you the classifications of this patent, the electrical connectors. Shao is an electrical connector.

You can see over here, the figure, and we have a timeline here. I won't -- I'm running a little short on time, but you can see the Shao file is granted, clearly prior art, way before we get to the patents through here. I have the history of the amendment, right, the amendment that's important, the 113 words. And then eventually the issue date, and the filing approximately of the '153, and then they file the ITC complaint and the '153 is issued. Again, they are accepting all these words.

In fact, during the Office Action you can see, I told you, magic claim 10. Again, there's 17 also, so focus on claim 10. I showed you that already, third aperture, right. Dealing with extending partially through.

Oh, by the way, 17, which also becomes in one of the independent claims, that same notion, third aperture.

So, Your Honor, these were added to independent claims to include this third aperture. And only after that did we get the notice of allowance. And that's going to make Shao all the more important, because the Examiner didn't have this. The record is going to show that. He didn't consider Shao despite classifying the patent and electrical connectors.

The figure speaks for itself in some ways, but we also have the text right below it. Shao argues -- Shoals argues, sorry, very similar words -- Shoals argues that Shao is not analogous art. Kind of like their Dr. Kenny argument, clearly. Just look at the field of the patent's classification and the field of search by the Examiner and also the art cited by the Examiner.

So, I mean, it will be interesting to hear their invalidity expert, rebuttal expert, Mr. Weiner, take these positions in light of the face of the patent.

The claims are directed to a molded structure that connects electrical connectors. It doesn't say

utility-PV scale patents in the claims. It's exactly what Shao shows. An electrical connector.

Your Honor can see there's going to be a big cable, feeder cable, going through, completely through. There will be no dispute about that. It's got two small cables, right. So in this patent there are two small cables. Guess what? In this one they actually go partially through. Two branch line conductors are symmetrically overlapped and crimped. This one, they are actually crimped, kind of like what they said at the Markman, by means of the K-shaped branch connector. This is what you have, 5, there's a crimping to form one joint, got the joint here, like a nexus, in two branch line conductor out-leads.

So here you actually have, especially how they are reading the patent, no doubt it's invalid. But even here, Your Honor, you actually do have a crimping. Notably, so Shao discloses these two separate cables form two apertures that only extend partially through consistent with the entire cable test. It's not a single cable creating an aperture that extends through the mold.

So, with that, Your Honor, especially under their construction, can't be valid.

So, Your Honor, I want to conclude my opening statement with this context. Voltage respects IP. It's filed for its own patents, both here in the U.S. and in

China. Independently developed its products before Shoals' '254 patent even issued. And, Your Honor, we have seen the disclosures in the patent family, the years of rejection, the 113-word amendment, and the carryover of those words into the '153.

Shoals has done great things for the solar industry and continues to do so, we don't doubt that. It's a unique aspect of the solar industry. There's a common goal of making the world safer, better, with clean energy. Everybody wants that. But this investigation is not about protecting innovation. Shoals is overreaching, whether it's the two patents that no longer exist, or it's the overreach we have here in various disclosures here. Part of that might be because of the performance of the company and the fact that we see in the market they're not performing well. Its share price is plummeting.

And they now have a law firm that is steering both litigation and patent prosecution strategy to craft claims to continue to sue Voltage and intimidate customers with threat of an exclusion order. Because that's happened. How do we know? Well, Your Honor, we'll perhaps hear later today how we know, and I'll leave it at that. But they are issuing messages to the market. Their IP should stop Voltage from selling its products and the customer shouldn't buy from Voltage in light of the exclusion order that they

will achieve, and if not from the exclusion order, they are going to continue to sue in district court. That's what they're telling the market.

On behalf of Voltage, I want to thank Your Honor and your staff for your thoroughness and taking in the evidence in this investigation, and, with that, I will hand it off. Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you. Let's take a 15-minute break before we proceed.

(The proceedings recessed at 11:35 a.m.)

(In session at 11:50 a.m.)

JUDGE BHATTACHARYYA: We're on the public record.

MR. SHIN: Good morning, Your Honor. I'll be presenting Staff's opening statement using Staff's demonstrative exhibit marked as SDX-1C.

May I approach with copies of the slides, Your Honor?

Your Honor, the private parties have done a good job detailing the disputed issues and their arguments supporting their respective positions. I would like to summarize the Staff's positions and to direct a few of the key issues from the Staff's perspective.

Your Honor, the only patent at issue now is the '153 patent, as you know the scope of the hearing has been narrowed. The '254 patent has been withdrawn by Shoals and

the '739 patent is no longer part of the investigation based on the ALJ's Order No. 20.

And so the Hikam Respondents are not participating in the hearing because they were only accused of infringing the '739 patent.

However, going forward, we still need to be aware of the parent '254 patent and its file history because the '153 is a continuation of the '254 patent, and the asserted claims carry over many of the same claim elements.

And the Staff expects Shoals' witnesses, when referring to the company's combine-as-you-go and plug-and-play EBOS system, to also reference various in-line fuses in other Shoals' patents and documents, including the '739 patent.

Here I've shown the schematic of Fig. 7 that we have seen previously from the Markman hearing and as well counsel earlier showed this diagram. The evidence is expected to show that it is in fact a working embodiment where there is still an electrical connection between the drop line and the feeder cable through the compression lug, even though the two wires are not directly touching each other.

Figs. 45 and 39 also show a more realistic one-drop line embodiment. However, these one-drop line embodiments similar to the zero connector assemblies in the

'739 patent are not technically covered by the issued claims, as each independent claim requires a first and a second drop line.

A two-drop line embodiment is disclosed, for example, in Fig. 29, but there are other nuances that might make Fig. 29 and other two-drop line BLA figures still fall outside the scope of the claims.

For example, depending on whether there is a third aperture or not, and I will address this issue again in a later slide.

Here the title of the '153 patent focuses on a lead assembly for connecting solar panel arrays to an inverter and the abstract emphasizes in the last line, quote, a system of the present invention doesn't require a combiner box, which is conventionally employed directly upstream of the inverter.

So we are really focusing on a larger solar power system and a lead assembly as a component of such a system.

That is ultimately why Shoals had to drop its newer EV or electric vehicle BLAs as domestic industry products, because they are not a part of solar power system.

Next slide.

Your Honor, here on slide 3 is an overview of the Staff's positions on each of the substantive issues that will be presented during the course of this hearing.

Overall, given the proper claim constructions, as ordered by the ALJ, the evidence is expected to show that there will not be a violation of Section 337. The Staff expects the evidence to demonstrate that the asserted claims of the '153 patent are not infringed by any of the accused Voltage Trunk Bus products, including its redesigns.

The Staff expects the evidence to also show that Shoals' alleged domestic industry Big Lead Assembly or BLA products do not practice any claim of the '153 patent.

Once the ALJ's Claim Construction Order came out in Order No. 16, the application of the ALJ's construction of aperture and partially through claim terms to Shoals' alleged BLA products is clear to the Staff, and Shoals' BLA products will not be shown to satisfy the technical prong.

Indeed, Shoals' technical expert, Mr. William Brooks, did not even present an infringement opinion based on the Staff's and Respondents' similar proposed constructions for the aperture and partially through claim terms. He did not present a literal infringement opinion on that construction and he did not present a doctrine of equivalent infringement opinion on that construction. He merely presented an opinion based on Shoals' later modified proposal that aperture should mean, quote, all or part of a pathway for the drop line or feeder cable within the undermold or primary mold, end quote.

However, Shoals' modified proposal was rejected in Order No. 16 and Shoals did not seek to supplement Mr. Brooks' report.

Ultimately, it is axiomatic that if Shoals' BLA products cannot satisfy the technical prong, then Shoals cannot then satisfy the economic prong either. The evidence is, thus, expected to show that Shoals has not satisfied the domestic industry requirement.

However, the Staff expects the evidence will demonstrate that the asserted claims are not invalid as anticipated by or obvious over the asserted prior art relied upon by the Voltage Respondents, and they are also not invalid based on indefiniteness.

Next slide.

I mentioned that the '254 patent is now no longer part of the investigation; however, it is still relevant to the '153 patent as its parent application and because many, but not all, of the claim elements from the '254 claims carried over to the '153 claims.

The specifically claimed elements in the '153 patent originated in amendments to the parent '254 patent application, as counsel earlier highlighted, where the Examiner proposed a 113-word amendment that Shoals accepted without dispute. Voltage's counsel showed the entire amendment in one of his slides. This lengthy amendment was

critical to Shoals obtaining a notice of allowance for the amended claims of the '254 patent. The Examiner's proposed amendment introduced new concepts, such as aperture within the undermold and extending partially through versus continuously through the undermold, among other limitations.

In the Staff's view, the '153 continuation patent as well as any other continuation applications are attempts by Shoals to undo and fix the very specific and narrow design of the lead assemblies claimed in the '254 patent.

So it would be helpful to understand the similarities and differences in the claim scopes, for example, of each patent's independent claim 1. Both of these claims are directed to a lead assembly for use in a solar energy installation, and it appears that many of the claim limitations in claim 1 of the '254 patent that I've emphasized in yellow highlighting and red font are no longer required in claim 1 of the '153 patent.

For example, the concentric requirements did not carry over to the '153 patent's independent claims, and the requirement that the second aperture be parallel to said first aperture is no longer required in the '153 patent 's independent claims either.

This would appear to make claim 1 of the '153 patent broader than claim 1 of the '254 patent, but after closer inspection we can see that claim 1 of the '153 patent

requires, not only a second drop line, but also a new third aperture extending partially through the undermold, which I have emphasized with blue highlighting.

So in one sense claim 1 of the '153 patent is not necessarily broader, because this new third aperture structure must, arguably, be separate and in addition to the second aperture.

And I think this issue was perhaps less emphasized during discovery, but it is clear from the plain and ordinary meaning in the context of at least claim 1 that a second aperture and third aperture are separate structural requirements. In other words, the claim's second aperture structure cannot also be the claimed third aperture structure, just as the claimed first drop line cannot also be the claimed second drop line.

At this point it is not as clear how this issue will be developed during the course of the hearing, but in the Staff's view this may have a major impact on how the evidence is analyzed for the issues of infringement, technical prong, as well as invalidity.

I would also like to mention that the originally proposed claims of the '153 patent application attempted to start with the one drop line lead assembly as counsel showed earlier, but Shoals eventually amended the claims to include a third aperture, which necessarily corresponds to the

claimed second drop line, such as by adding a new drop line wire to the one drop line figure in Fig. 7 and Fig. 39 embodiments.

Next slide.

In slide 5 I'm comparing independent claim 1 of the '153 patent with independent claim 21 of the '153 patent. At a high level, we see that the preambles are different. Claim 1 is directed to a lead assembly while claim 21 is directed to a larger solar power system, which includes, not only a similar lead assembly from claim 1, but now also a plurality of solar panels.

And there are many other subtle differences between these two claims, as shown here with my yellow highlighting and red font, which indicates limitations that do not carry over, and my blue highlighting, which indicates new limitations in claim 21.

Next slide.

Here on slide 6 we have the same type of comparison that is done between independent claim 21 of the '153 patent and independent claim 24. Here there are fewer differences between these two independent claims, as shown again using my yellow highlighting to emphasize what is no longer in claim 24 and blue highlighting to emphasize new claim limitations in claim 24.

Next slide.

Your Honor, this slide is a summary of the relevant claim constructions in Order No. 16 for the '153 patent. Based on the ALJ's construction of aperture and the other related terms, the evidence is expected to show that at least the two aperture-related elements shown in the final row of this table will not be satisfied by the accused Voltage products or by Shoals' BLA products. The evidence is, thus, not expected to demonstrate infringement or satisfaction of the technical prong for either set of the products at issue.

Next slide.

Here on slide 8 I have provided a demonstrative of the Staff's cable test. As discussed during the Markman hearing, the Staff modified its proposed construction for the aperture term to, quote, entire pathway of the feeder cable or drop line wire within the undermold or primary mold when viewed as if the feeder cable or drop line wire were removed.

Your Honor referred to the Staff's proposal as the cable test during the Markman hearing and appears to have adopted a construction that is largely consistent with the Staff's proposal.

The Staff's cable test is illustrated here in the top two figures where one cable forms two drop lines, similar to actual products in this investigation. The

smaller cable is where the pathway -- the smaller cable where the pathway to the mold is outlined in blue, and that is the second aperture used by and connecting both drop lines.

The second aperture extends completely through the mold and through the compression lug, just like the first aperture of the larger feeder cable below it, where the pathway that it forms through the mold is outlined in green. And it also extends completely through the mold and through the compression lug.

Now the next question is whether this also shows a third aperture corresponding to a second drop line. The Staff submits that the third aperture must necessarily have a different and separate structure from the second aperture and, thus, the second and third apertures cannot be the same overlapping structure.

Here, in order for there to be a third aperture, one must first add a new additional drop line, which would then be referred to as the claimed second drop line and not just a generic third drop line, if that makes sense.

In other words, the Staff views the claims as more focused on the apertures within the confines of the undermold or primary mold and less focused on the structures of each particular drop line.

So, in summary, the Staff views the top left

schematic as demonstrating a first aperture and a second aperture, but there is no third aperture because the other drop line does not correspond with a different structural drop line pathway. And this embodiment would appear to be outside the scope of the claims.

In contrast, the bottom right schematic demonstrates three separate apertures for two separate drop lines and a third aperture for the feeder cable. And this embodiment would appear to be within the scope of the claims.

But, alternatively, even if the second and third apertures could somehow overlap, the apertures would still be found to extend completely through the undermold and not partially through.

Let's look at the products at issue for the infringement analysis and technical analysis, but, out of caution, we first need to go on to the confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

MR. SHIN: Your Honor, next we have invalidity as shown on slide 18. As indicated by Voltage's counsel, the Solon '741 reference is no longer being presented as a prior art reference based on the ALJ's earlier ruling sustaining Shoals' HPO on this issue.

Furthermore, Voltage is no longer asserting Amphenol in the combination of Shao and Tamura. That leaves Voltage with two remaining prior art defenses and possibly a lingering 112 indefiniteness defense for aperture as well.

For anticipation, Dr. Kenny is expected to testify that the 2012 Shoals wire harness anticipates claim 21, but, given the many structural requirements in claim 21, his anticipation opinion is not expected to be persuasive.

For obviousness, Dr. Kenny is left with one prior art combination of Yamawaki and Shao, but, for this combination, the evidence is also expected to fall short to show invalidity, as Shoals' counsel explained in greater detail during his presentation.

In the Staff's view, Respondents are not expected to present evidence of a clear and convincing nature to prove that any asserted claim of the '153 patent is invalid for being anticipated or rendered obvious by the asserted

prior art or shown to be indefinite.

Next slide.

Your Honor, in conclusion, by the end of the hearing the evidence is expected to show that the Voltage Respondents have not violated Section 337.

Subject to any questions you may have, this concludes my presentation. Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

We're going to take the lunch break a bit early so we can make sure that LiveNote is up and running. Thank you everyone. We'll be back in one hour.

(The hearing recessed at 12:33 p.m.)

A F T E R N O O N S E S S I O N

(In session at 1:33 p.m.)

JUDGE BHATTACHARYYA: Good afternoon, everyone. Please be seated.

We're on the public record. Regarding the schedule, thank you, I appreciate the email to chambers regarding the parties' agreement. Pursuant to the agreement, we will conclude at 5:30 tomorrow, on Tuesday, on Wednesday we'll begin at 9 a.m. and conclude at 2:45 p.m., and on Thursday we'll conclude at 6 p.m.

Are we ready to proceed with our first witness?

MR. OU: Your Honor, before we do that, one housekeeping question for Your Honor, if I may.

JUDGE BHATTACHARYYA: Yes.

MR. OU: It's unclear if Mr. Brooks is going to take the stand today. There's a few witnesses in front of him. But we did do disclosures of his slides yesterday, and the parties have met and conferred, and there's still a large number of objections that we're still trying to work through.

One proposal that Voltage would like to -- obviously your guidance on, Your Honor -- a lot of them fall within Order No. 28, which Your Honor has already addressed, and the problem with potential waiting until this evening for another round of updated slides is we really don't know

what is going to be the scope of Mr. Brooks direct and what they're planning to elicit. Currently the slides are like 160 slides, and we have 40-plus objections. So, Your Honor, we were proposing, if Your Honor would indulgence, perhaps if we could take that up before the day ends so the parties have a clear picture as to how to address that issue before tomorrow's day starts.

JUDGE BHATTACHARYYA: Are you suggesting that we conclude, say, ten minutes early, and then argue or do preliminary argument?

MR. OU: Yes, Your Honor, if that would be appropriate, I think guidance from Your Honor would help the parties narrow the issues or resolve them if we're able to do that.

JUDGE BHATTACHARYYA: Why don't we plan on -- Mr. Brooks is going to start today, though, right?

MR. BARQUIST: It seems unlikely that Mr. Brooks will start given we have two witnesses plus some video.

MR. OU: That's right, Your Honor.

JUDGE BHATTACHARYYA: If Mr. Brooks doesn't begin, we'll conclude ten minutes early in order to discuss the objections. If he does begin, maybe before his testimony we'll discuss the objection.

MR. BARQUIST: Also, Your Honor, we could do the first 15 to 30 minutes, which is mostly qualifications and

setting the groundwork. Whatever works given the timing.

JUDGE BHATTACHARYYA: Okay.

MR. OU: Thank you, Your Honor.

MR. HARRIS: Shoals will call as its first witness Ben Macias.

JUDGE BHATTACHARYYA: Good afternoon, Mr. Macias.

BEN MACIAS,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

MR. HARRIS: Your Honor, may I approach the witness with a binder? Thank you.

DIRECT EXAMINATION

BY MR. HARRIS:

Q. Good afternoon, Mr. Macias. Thank you for being here today.

Are you currently employed by Shoals?

A. Yes.

Q. And what is your title?

A. Chief Revenue Officer.

Q. And when did you start working for Shoals?

A. I started working for Shoals in May of 2010 up until August of 2014, and then I came back in December of 2017.

Q. And you've been with Shoals ever since 2017; is that correct?

A. Yes.
Q. What was your job title during your first stint at Shoals?
A. Various roles, but the last role that I had was vice president of global sales.
Q. And what titles have you had since returning to Shoals in December of 2017?
A. Came back as vice president of sales, then senior vice president of sales and marketing, and then chief revenue officer.
Q. Mr. Macias, are you an engineer?
A. No.
Q. Do you know when Shoals was founded?
A. Shoals was founded in 1996.
Q. And do you know what Shoals' business was in 1996?
A. We made automotive parts.
Q. Is Shoals still in the automotive parts industry?
A. No.
Q. What is Shoals' business today?
A. We make electrical balance systems components.
Q. What do you mean by electrical balance systems?
A. There's an acronym for it, it's called EBOS, one way we refer to it, but it's effectively the electrical componentry that is needed to take the power from the solar

panels to the inverter, we carry the power in between.

Q. Where is Shoals headquartered?

A. In Portland, Tennessee.

Q. And does Shoals manufacture products?

A. Yes.

Q. And where does Shoals manufacture products?

A. We manufacture products in Tennessee, Alabama, and California.

Q. So how many manufacturing plants does Shoals have?

A. Five.

Q. And how many of those are located in Portland, Tennessee?

A. Three.

Q. And how many in Alabama?

A. One.

Q. Does Shoals manufacture products outside of the United States?

A. No.

Q. Has Shoals ever manufactured any products outside of the United States?

A. No.

Q. Now do you understand that Shoals BLA product is at issue in this investigation?

A. Yes.

Q. And where does Shoals manufacture its BLA product?

A. At our facilities in Portland, Tennessee.

Q. Does Shoals manufacture its BLA product at any other factory?

A. No.

Q. I'd like to show you what's been marked as Exhibit 115.

Can you identify what this is?

A. This is our headquarters plant 1.

Q. And does BLA get manufactured in this plant?

A. Yes.

Q. Approximately how many square feet is this plant?

A. Approximately 100,000 square feet.

Q. And are there other plants in Portland that manufacture the BLA product?

A. Yes.

Q. What plant is that?

A. We refer to that plant as plant 4.

Q. I'd like to show you Exhibit CX-259.

Can you identify what that is?

A. This is a picture of plant 4.

Q. How far away from plant 1 is plant 4?

A. I believe it's approximately six miles away.

Q. And approximately how many square feet is in

plant 4?

A. Approximately 220,000 square feet.

Q. I'd like to show you a demonstrative, Exhibit CDX-9, and specifically 9.2.

Do you recognize what this is?

A. Yes.

Q. And what is this?

A. These are our BLA molding machines.

Q. And in what plant is this picture taken?

A. This appears to be plant 4.

Q. Okay. And is that typical of the BLA or the machines, excuse me, that manufacture the BLA product?

A. Yes.

Q. Okay. Does Shoals sell inverters?

A. No.

Q. Does Shoals sell solar panels?

A. No.

Q. So, at a high level, what is it that Shoals provides to its customers between the solar panel and the inverter?

A. Shoals provides the electrical componentry that's needed to take the power from the back of the solar panel to the inverter, all the cabling and closures in between.

Q. Okay. Now are there different wiring architectures used in EBOS to get the power from the solar

panel to the inverter?

A. Yes.

Q. Okay. I'd like to show you what's been marked as Exhibit CX-167.

Can you identify what that document is?

A. Yes. This is a marketing document.

Q. And what is the purpose for this marketing document?

A. The purpose would be to explain the three different configurations that you can set up solar fields today.

Q. Okay. Do these three different configurations have any particular nomenclature associated with them?

A. The first one on the top would be what we refer to as the home run architecture. The second one in the middle, that is our wire harness with home run, an in-line fuse architecture back to a combiner box, and the one on the bottom is our BLA system that has the wire harnesses that plug into the BLA and terminate into a disconnect box.

Q. Okay. Thank you. I want to focus on each of these three different architectures for a minute.

So if you wouldn't mind focusing on that top architecture, can you explain for the Judge what happens in the home run architecture?

A. Yeah, no problem. So with the home run

architecture, we have individual home runs that plug into the end of the solar panels, and then they run all the way back to this combiner box here that's in the center of this picture.

Q. Can you describe for us what a combiner box is?

A. Yes. So a combiner box is used to aggregate many individual home runs together, and the wire-runs back are fused typically on the positive side. They are fused in fuses and fuse holders, and then it has a switch. And then from there it gets combined into bigger DC feeder cables back to the inverter.

Q. So what's the purpose of the fuse that you mentioned as contained within the combiner box?

A. The purpose of the fuse would be to protect the cable from any overcurrent or overvoltage that may occur within that string.

Q. And what does an inverter do?

A. An inverter converts electricity or power from DC current to AC current.

Q. What --

A. AC is what we use for our houses.

Q. Thank you. Let's focus now on the second architecture that's identified in that exhibit.

Can you tell us about the architecture with the component harness, and I think you said home runs?

A. Yeah. So this would be an example of what a combiner box installation with in-line fuse would look like with our wire harnesses also referred to as component harnesses. From those -- those collect multiple solar panels together, and then they plug into a home run here. You can see, compare this to the first one, a lot less home runs in this example because of the fact that the wire harnesses are paralleling them together, so there's less home runs, and then those go back to the combiner box.

Q. Okay. When you say paralleling them together, what do you mean by that?

A. So we're taking multiple solar panels together and putting them on a trunk.

Q. Okay. Now does the component harness architecture still require a combiner box?

A. Yes.

Q. Why is that?

A. Well, with the wire harnesses we are reducing the number of home runs that are required, but you still need to protect the cabling that's coming into the combiner box with a fuse.

Just a little bit bigger of a fuse inside the combiner box, and then the branches that you see there, those require in-line fuses as well.

Q. When you say the branches that you see there,

what are you referring to, if you can describe that?

A. Use this pointer?

Q. Sure.

A. May I?

These guys right here.

Q. So you're pointing to the callout of component harness and the wires that are pointing vertical and down, up and down?

A. Correct.

Q. Okay. Now let's talk for a minute about the third architecture that's shown in this document.

Can you tell us what that is?

A. That is an example of the BLA installation with component harnesses.

Q. So how does this third architecture differ from the second architecture?

A. Yeah. So still need to utilize component harnesses or wire harnesses, so we're collecting multiple solar panels together on a wire harness. From there it gets picked up with the BLA. This is basically an extension of the DC feeder cable that goes to the -- then to the disconnect box, and then from the disconnect box it goes to the inverter.

Q. Okay. You mentioned a disconnect box.

Can you identify what the disconnect box is

there?

A. This one here in the middle (indicating).

Q. Okay. And what is a disconnect box? What's the function of a disconnect box?

A. So the function of the disconnect box is to isolate the subarray, so if you need to do O and M maintenance on this particular box or the subarray, you can flip the switch, it's kind of like a light switch, it's on or off, and you can perform a service.

Q. So is it a safety mechanism?

A. Yes.

Q. Okay. Now does a disconnect box contain fuses?

A. No.

Q. Does a disconnect box combine electricity from several cables?

A. Not several cables.

Q. Okay. I'd like to now show you what's been marked as Exhibit CX-144.

Can you identify what that document is for us?

A. This is our interconnect system with the BLA marketing presentation.

Q. How is this document used at Shoals?

A. We use this to communicate the features and benefits and advantages of the BLA system to our clients.

Q. And I'll direct your attention to page 3 of this

exhibit.

Can you identify or tell us what those pictures are showing on page 3?

A. This is a lot of wire. This is for our home run application.

Q. Okay. So of the three architectures that we identified, would this be the first architecture?

A. Yes, the one on the top.

Q. Okay. And tell us about why there are, you know, you said this is a lot of wire, why there are so many wires running there?

A. Each one of those wires is going individually from the solar panels to back to the combiner box.

Q. Okay. Now I want to show you page 4 of this exhibit, 144, CX-144.

Can you tell us what we're seeing here?

A. A mess. This is trenching that is typically done with the home run solution.

Q. And why is trenching typically done with the home run solution?

A. Typically the cables go underground from the solar panels to -- back to the combiner box.

Q. Okay. And then let's go to page 5 of CX-144.

Can you describe for us what's shown on this page of the exhibit?

A. This is an example of the positive and negative BLA running through the array of solar panels, and then terminating into a DC disconnect switch.

Q. Okay. Can you compare what's shown here on this page with the page 3 that showed the home run wiring?

A. The big difference is the amount of wire that's utilized in the -- on page 3 -- as it compares to what we're seeing here on page 5. It's just a lot more wire. The BLA cables significantly reduce the amount of wire that's needed, eliminating all the home runs that are required.

Q. Okay. And in the BLA architecture is trenching required?

A. No.

Q. Why not?

A. That's one of the benefits of the BLA system, is that we're able to take these cables from -- that were conventionally done underground and bring them above ground where they are suspended in free air, as you see here, by a messenger wire, and, because of that, one of the main advantages of the system is that we're able to utilize Freer D rig cables so we can use smaller cables and we can use a lot less of them.

Q. Thank you. I'd like to now show you what's been marked as Exhibit JX-114.

After you've had a chance to find that exhibit,

can you please identify it for us?

A. This is our Q3 2022 Investor Presentation.

Q. And how is this document used at Shoals?

A. We use this presentation to communicate to the advantages and the features and benefits to our shareholders as well as quarterly updates of our financial performance to our shareholders.

Q. Okay. I'd like to first direct your attention to page 18 of JX-114.

Can you tell us what's being conveyed by page 18?

A. So this is another example showing the individual home run that we saw on the top of the comparison of the three, just a little bit more called out.

Q. And does this -- what are you trying to communicate to your investors by displaying this or showing them this page?

A. We're trying to communicate that in a conventional home run system there's thousands of individual wire runs that need to run back to a combiner box, which tends to lead to more connections or potential failure points and a lot more cable.

Q. Okay. Now let's turn to page 21 of JX-114.

And what is this page intended to describe to your investors?

A. This page we use to communicate the six

advantages of the BLA system.

Q. Okay. Why don't we talk through each of these six. Can you explain the first, the first benefit?

A. Yes. So the first benefit is that it can be installed by anyone. The reason being is that these are prefabricated, precut to length. They are pre-terminated with plug-and-play push connectors. And, for that reason, we don't need to utilize licensed electricians and we can utilize general laborers on site, which in turn would result in lower labor rates and fewer labor hours needed.

Q. Okay. Let's talk about, if you wouldn't mind, the second advantage there.

A. So similar to earlier, the next one here is that it enables an aboveground installation. So we saw the cables in the prior example. Those were being suspended in free air by a messenger wire. Because we're able to do that, no trenching or conduits are required. And, as a result, we don't need to excavate on site.

Q. Okay. Let's -- if you wouldn't mind describing the third advantage.

A. This goes -- that picture that I showed you a little bit earlier with the home runs and the BLA, with the BLA it significantly reduces the wire runs that are on site, and then, as a result of that, there are fewer string runs and there are fewer inverter runs, which results in fewer

labor hours and less material that's required on site.

Q. Okay. And then would you tell us the advantages that are conveyed on point 4?

A. Yeah. This is a big one. So the conventional systems utilize combiner boxes with fuses inside of them. There's a big problem that has been around in the industry for a long time, is just fuses prematurely failing, and that's a big O and M thing.

So with the BLA system, we remove the fuses and fuse holders that were in the combiner box and put them out into free air where they perform better, quite frankly, and molded those in-line on the outputs of those component harnesses.

So, as a result of that, same story here. Lower labor rates, fewer labor hours that are required.

Q. Now you've mentioned O and M a couple of times.

Can you just tell us what O and M means?

A. Operations and maintenance.

Q. And how is that -- how does that come into play in a solar field?

A. So once these solar projects are turned on, there tends to be some electrical components, there tends to be some structural moving components that need to be serviced and maintained. So that's why you would have to incorporate O and M or operations and maintenance into your strategy.

Q. Okay. Thank you.

Now if you wouldn't mind telling us about the advantage number 5 from this slide.

A. Yeah. So the fifth advantage here is with the -- increases safety and reliability on the site, pretty significantly, and that's largely due to the fact that it is pre-terminated in a factory-controlled environment with plug-and-play push connectors so that, effectively, when you get it on site all you got to do is push the cables in together and they're connectorized. So a lot less potential failure points as a result of that.

Q. And then, finally, could you describe advantage number 6 for us?

A. Yes. So I think I just touched on this, but significantly reduces maintenance requirements, everything is aboveground, to the extent that you can have some cables aboveground rather than underground, a lot easier to service them if you have any troubles with the cables that are underground.

So, as a result of that, along with the reductions of the connection points that are needed, in a conventional system, and the number of -- number of torque points in a disconnect box that we see are a lot less than a combiner box. So that tends to lead to a lot fewer potential failure points, which can lower O and M costs.

Q. Thank you. Now does Shoals ever sell its BLA product without a wire harness?

A. No.

Q. Why not?

A. You need the wire harnesses to collect all the solar panels together, and then, from there, the solar panels, those wire harnesses, they plug into the BLA's DC feeder cable, and then from there it goes back to the DC disconnect box, and then from there to the inverter. So you need all of the components to create a system.

Q. Okay. When did Shoals first sell its BLA product?

A. In 2016.

Q. I want to now show you what's been marked as Exhibit CX-235.

Can you identify what this is for us?

A. This is a data sheet for our Big Lead Assembly or also referred to, as an acronym, our BLA.

Q. How is this document used at Shoals?

A. We use this to communicate the features and benefits, the options and technical specifications of the BLA to our clients.

Q. Okay. I want to focus on the pictures on the right-hand side of this document. I want to have you focus on that second picture for a second.

Can you tell us what that depicts?

A. That is our BLA product.

Q. And when you say "our BLA product," what does Shoals sell as its BLA product?

A. We sell a prefabricated, pre-terminated, 100 percent customized to that particular project. So it's very specific as a pre-done solution to our clients.

Q. Okay. And if you'll notice, it looks like there are six different, I don't know, what would you call those six different things that are sitting there on that picture?

A. I refer to them as mold drops.

Q. Okay. So we have six mold drops, and what is the wire that they're connected to there?

A. That is a drop line.

Q. Okay. And when you say a drop line, can you take the pointer that you have and identify what the drop line is?

A. (Indicating).

Q. Okay. And on the picture above that's circled in red, can you identify the drop lines there?

A. (Indicating).

Q. I guess that's not a circle, that's a square.

A. Here and here.

Q. And then the big cable, can you identify what that is?

A. That is the DC feeder cable.
Q. Okay. And how many mold drops are typically on a BLA product that Shoals sells?
A. It depends on the project.
Q. Okay. Would Shoals ever sell a BLA product with one mold drop and no other mold drops?
A. Probably not.
Q. Okay. Now let's take a look at the bottom. So can you identify what the difference is between those pictures there at the bottom?
A. The main difference is that is the number of drop lines.
Q. Okay. And can you identify the drop line configurations of those mold drops there?
A. Sure. This is one drop line.
Q. And you're pointing to the figure, the top figure on the left?
A. Yes.
Q. Okay.
A. This is two drop line.
Q. And that's the top middle?
A. Yes.
Q. Okay.
A. Three drop line.
Q. Top right.

A. Yes. Four drop line.
Q. Bottom left.
A. Yep. Six drop line.
Q. Middle bottom.
A. And eight drop line.
Q. That's the bottom right. Okay.
Does Shoals sell any mold drops with a different number of drop lines than that shown on this exhibit?
A. Yes.
Q. And what would those be?
A. There could be a five-input mold drop and there could be a seven-input mold drop.
Q. Okay. Now let's -- I'm going to show you what's been marked as CPX-36.
Your Honor, may I approach to hand the witness the exhibit?
JUDGE BHATTACHARYYA: Yes.
Q. Can you identify for us what exhibit CPX-36 is?
A. This is an example of a four-input mold drop -- one, two, three, four, those are the drop lines -- and then this is the DC feeder cable.
Q. Okay. So you've identified the four drop lines and the DC feeder cable; is that right?
A. Yes.
Q. Okay. And then what is your hand on?

A. This? This is the mold drop.
Q. That's the mold drop, okay. And what is at the end of each drop line?
A. These are connectors.
Q. Okay. And what do those connectors attach to?
A. These connect to the wire harnesses.
Q. And then what does the DC feeder cable connect to?
A. The DC feeder cable would connect to the disconnect box.
Q. And what do the wire harnesses connect to?
A. The wire harnesses on the input side, they connect to the solar panels, and on the output side they plug into these push connectors here.
Q. Okay. I'm now going to hand you what's been marked as CPX-36.1.
Your Honor, may I approach again? Thank you.
JUDGE BHATTACHARYYA: Yes.
Q. Mr. Macias, can you ask us -- excuse me -- can you tell us -- I'll ask -- can you tell us what that is?
A. This is an example of a BLA mold drop that's been cut in half.
Q. Okay. And can you identify for us the different parts, the internal parts, that can be shown by the cut-in-half mold drop?

A. Yeah. So the first one is the DC feeder cable, so that's this one right here (indicating).

Q. Okay. And that's the horizontal cable traveling through the mold drop?

A. DC feeder cable, yes.

Q. Okay. And then what else?

A. The next ones would be the drop lines. These are the copper drop lines here (indicating).

Q. Okay. And can you identify -- how many drop lines are in that?

A. Yeah, there are four drop lines -- one, two, on the left side, and then three and four on the right side.

Q. Okay. And what's the metal square there that I'm seeing in the middle?

A. This would be the compression lug that is required to connect the DC feeder cable to the drop lines right here.

Q. Okay. And how are the drop lines connected, I mean, how does the compression lug affect that connection, if you wouldn't mind telling us?

A. Sure. The compression lug attaches the drop lines to the DC feeder cable to create an electrical connection.

Q. Okay. And are the drop lines -- so I think you identified drop line one, two, three, and four --

A. One, two, three, four.
Q. So the way that you've labeled those drop lines, drop line 1 and 3, would that be the same wire?
A. Yes.
Q. Now if it's the same wire, why don't you identify them as a single drop line?
A. It can handle the electrical current on the first and second, and they also are separate -- they plug into separate wire harnesses.
Q. Okay. Now how does Shoals manufacture the mold drop?
A. With molding machines.
Q. And are those what we looked at earlier?
A. Yes.
Q. Okay. And how many different manufacturing molds are there for the Shoals BLA mold drops?
A. We tried to be as efficient as possible, so we typically use one, and, you know, if it's more efficient to use one or just swap out a tool, we use a different tool.
Q. Okay. And when you say if it's more efficient to swap out a tool, can you explain that process for us?
A. I'm going to bring this one back up.
So on the -- on this example there are two more spots here on the left side and the other side, the right side (indicating).

And what we'll do is we'll either open them and put new drop lines in there to make more drop lines or close them off if we don't need all of them.

Q. Okay. And you said something about switching out a tool if it's more efficient.

What does that look like?

A. So it's just a different tool, so if we had a different wire, it might make more sense with changing out the tool, because it might have less material utilized in that one.

Q. The same machine gets used for all -- for the BLA mold drops regardless of how many drop lines get used?

A. Yes.

Q. Does anything about the feeder cable change depending on the number of drop lines?

A. No.

Q. Does anything about the body of the mold drop change depending on the number of drop lines?

A. No.

Q. Does anything vary in the drop lines depending on how many the mold drop has?

A. No.

Q. So I want to bring back up CX-235 and focus on those six mold drops that we looked at before.

Structurally, how are these mold drops different,

if they are in any way?

A. The only main difference between all of them is the number of drop lines.

Q. Okay. Do all of the mold drops at the bottom of this page, do they all operate in the same way?

A. Yes, they all function the same way.

Q. And do all the configurations include a feeder cable?

A. Yes.

Q. Do all the configurations include drop lines?

A. Yes.

Q. Do all these configurations have an undermold?

A. Yes.

Q. Do all of these configurations have an overmold?

A. Yes.

Q. Okay. I want to -- I want you to go back to CPX-36.1, the one that's cut in half there, yeah.

Does that have an undermold?

A. Yes.

Q. Can you identify that for us?

A. So this is the undermold here (indicating).

Q. And if you wouldn't mind showing the Judge what you're pointing to.

A. Right here. So there's a slight color difference, the undermold is the lighter color right there.

Q. And does CPX-36.1 have an overmold?
A. Yes.
Q. Can you identify that for us, please?
A. That is the darker molding on the outside right there and it goes around the edges (indicating).
Q. Okay. I want to ask you, going back to our exhibit that's on the screen, Exhibit CX-235, I want to ask about the mold drop with the single drop line. Circled this time there.
How often is this configuration, the mold drop with the single drop line, used by Shoals?
A. Rarely.
Q. Okay.
MR. HARRIS: Your Honor, I've concluded with the physical exhibits. Would you like to see them?
JUDGE BHATTACHARYYA: Not at this time.
MR. HARRIS: Okay.
Q. So, Mr. Macias, can you tell us what is the market for the BLA product?
A. The market for the BLA product would be utility-scale solar farms.
Q. And can you describe for us what a utility-scale solar farm is?
A. There are a couple different sources on what constitute actually utility-scale solar farm, but typically

greater than 1 megawatt or one million watts.

Q. And how big would a utility-scale solar farm get?

A. A 1 megawatt project would probably be around four to five acres, and utility-scale projects that are far greater than that would likely be in the hundreds or thousands of acres and square miles, to give you some perspective.

Q. Okay. And who are Shoals' customers?

A. Direct customers, EPCs.

Q. When you say EPC, what does that mean?

A. It's an acronym, another acronym for us. It's referred to as engineering, procurement and construction.

Q. What do -- what's the role of an EPC in a utility-scale solar farm?

A. The role of an EPC is to engineer the project particulars, procure all of the material that's needed to construct it, and then ultimately construct it and connect it together.

Q. Does Shoals have any other customers besides EPCs?

A. Yes.

Q. And who would that be?

A. Those would be the end owners or utilities of projects.

Q. Okay. And what has been the reception in the

marketplace of the BLA product?

A. It's been phenomenal.

Q. From your experience why do you say that?

A. Where do I start? It's revolutionized the way that we think about or -- think about how we install conventional solar plants and reimagine it in a way that is a lot simpler to install.

Q. Okay. I want to take you back to JX-114 that we've previously talked about, and direct your attention to page 22 of that exhibit.

A. One second.

Q. I'll wait for you to get there.

A. That was --

Q. JX-114.

A. 114, okay. Yep.

Q. And we're on page 22.

Can you tell us what the purpose of this slide is?

A. The purpose of this slide was to communicate to our shareholders and investors what the industry says about us as it pertains to our BLA system solution.

Q. And what have been those comments?

A. They have been overwhelming.

Q. In what way?

A. We can see it here in a few examples, but it's

just revolutionized the way that we've come to think about utility-scale installations and how they are put together.

Q. Okay. And in your experience has any customer purchased the BLA product and complained about it?

A. No.

Q. Has Shoals won any awards for its BLA product?

A. Yes.

Q. I'd like to direct your attention to Exhibit CX-256.

Can you identify for us what this is?

A. This is PV Magazine's Annual Awards.

Q. Okay. And I'll direct your attention to page 10 of this exhibit.

Can you identify what this is?

A. This is the balance of systems category that we won the 2019 PV Magazine award for balance of systems.

Q. Okay. And if you wouldn't mind reading for us the last paragraph that shows up on that page?

A. "The jurors named this entry from Shoals Technologies as the winner, thanks to its proven potential for speeding up installation times and bringing down component costs by eliminating combiner boxes and simplifying this aspect of installation. It was also seen as a cost-competitive product."

Q. As the chief revenue officer for Shoals, would

you describe the BLA as a successful product?

A. Yeah.

Q. How so?

A. Since we've introduced it, our revenues have gone up every year. It has, as I mentioned previously, reimagined the way we think about how we install utility-scale fields today from conventional to now BLA. When we came up with this idea, a lot of folks thought that we were going to cannibalize our conventional home runs with combiner boxes and our other solution we talked about earlier, our wire harnesses, with our home runs back to a combiner box. And it's done anything but that.

Q. Thank you.

MR. HARRIS: Your Honor, we're now going to enter into a section of confidential information. This is Shoals' confidential information.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving back to the public record.

BY MR. HARRIS:

Q. Mr. Macias, are you familiar with the Respondent in this action, Voltage?

A. Yes.

Q. And do you consider Voltage to be a competitor to Shoals?

A. Yes.

Q. Does Voltage sell a competing product to Shoals' BLA product?

A. Yes.

Q. Do you know the name of the competing product that Voltage sells?

A. Yes.

Q. And what is that?

A. The LYNX.

Q. And when did you become aware that Voltage was selling the LYNX product in competition with Shoals?

A. Approximately 2021.

Q. And how did you become aware of the LYNX product in 2021?

A. I think first we started losing some projects, and then we went to their website, and we saw the LYNX

product.

Q. When you first became aware of the LYNX product in the market, what were your thoughts about it?

A. It looked like a mirror image. It looked identical.

Q. To what?

A. The BLA.

Q. Okay. And have you seen any harm to Shoals' business by Voltage's sale of the LYNX Trunk Bus?

A. Yes.

Q. How so? Can you describe that?

A. I mentioned previously we're losing projects. We're being undercut significantly on price. Upon information and belief that I have, they are manufacturing in China and dumping the LYNX system into the United States.

Q. Have you seen any other harm?

A. Price, our price has come down significantly, and as a result our prices, our margins, upwards of 50 percent is kind of the difference, and I would say, lastly, you know, reputational harm.

Q. What do you mean by reputational harm?

A. Folks have known Shoals for quality products for a long time, especially with BLA, and any product that comes short of that is a potential for the customer to question technology that we have.

Q. Okay. And how has Shoals responded to the harm that it felt?

A. We hired you guys. We hired our -- we went to our attorneys and said, hey, we're being harmed, we're being undercut, looks identical, and we need to do something about it.

Q. Okay.

MR. HARRIS: Thank you, Mr. Macias.

Just for the record I may have said Exhibit 144 at one point. Exhibit JX-114 was the exhibit we were looking at.

With that, I have no further questions for this witness at this point.

JUDGE BHATTACHARYYA: Thank you.

MR. OU: Good afternoon, Your Honor. Philip Ou for Voltage.

CROSS-EXAMINATION

BY MR. OU:

Q. Good afternoon, Mr. Macias.

A. Good afternoon.

Q. I took your deposition a few months ago back in December.

Do you recall that?

A. Yes.

Q. And when I took your deposition, you were --

A. Excuse me. If I could have another water?

MR. OU: Sure.

May I approach?

THE WITNESS: Thanks, man.

Q. Mr. Macias, when I took your deposition back in December of last year, do you remember you were testifying under oath?

A. Yes.

Q. And do you remember you were also designated as a corporate representative on behalf of Shoals on certain topics?

A. Yes.

Q. So, in other words, you were to tell the truth based on what you know in your individual capacity and also you needed to tell the truth with respect to topics where you were the corporate spokesperson for Shoals.

Does that make sense?

A. Sure.

Q. And in order to testify on behalf of Shoals, you were speaking on behalf of the company.

Do you understand that?

A. Yes.

Q. And with respect to your testimony on behalf of the company, you testified truthfully?

A. Yes.

Q. Do you remember in the deposition after every break you'd go talk to your attorneys, we'd come back on the record, and I said, Mr. Macias, I'm giving you an opportunity, is there anything you want to supplement on the record or correct, sometimes you make mistakes.

Do you remember we did that pretty much after every break?

A. Yes.

Q. Okay. And since you took -- since your deposition was taken back in December, have you had a chance to review your deposition testimony from that time?

A. Yes.

Q. And did you review it in preparing for testimony today?

A. Yes.

Q. Is there anything about your testimony from back in December that in that review you came across and said, you know, I said X but actually it really should be Y? Is there anything like that that you want to tell me before we begin further questioning?

A. No.

Q. Let me start where your counsel left off.

I think you said that you first learned about Voltage's LYNX product in 2021; is that right?

A. Yes, approximately 2021.

Q. And you went to their website, right?
A. Yes.
Q. And you saw their product, and I believe your testimony was that it looked identical to the BLA.
That's what you said, right?
A. Yes.
Q. And then I think after that you said time passed, you hired Maschoff Brennan, you thought you were getting harmed in the market, and then this lawsuit happened, right?
A. Yes.
Q. Shoals believes that the BLA revolutionized the industry, right? I think you said that. Is that right?
A. Yes.
Q. And part of that is removing combiner boxes; is that right?
A. Yes.
Q. The BLA is a wire harness, you would agree, right?
A. The BLA is a DC feeder cable.
Q. Is the BLA a wire harness?
A. No.
Q. So the BLA -- what makes the BLA a DC feeder cable and not a wire harness?
A. So, as we discussed earlier, the wire harness that we utilize, they plug into the solar panels, and then

depending upon the system architecture, they either plug into a home run that runs all the way back to a combiner box, or they plug into the BLA cable.

Q. Is it fair to say, then, that internally at Shoals, Shoals refers to the BLA as a DC feeder and doesn't refer to it as a wire harness?

A. We mainly refer to it as BLA.

Q. Okay. And the BLA, I think you said the main cable or DC feeder cable, that's also a trunk cable, right?

A. Some can refer to it as a trunk cable, yes.

Q. And Shoals refers to it as a trunk, right?

A. It can be referred to -- different acronyms or different ways of calling it, either a trunk or a DC feeder cable.

Q. Okay. And today when your counsel asked you questions, I heard very often referring to the smaller cables or inputs that are coming into the BLA mold drop as drop lines.

We heard that, right?

A. Yes.

Q. Now do you call those drop lines in your ordinary work at Shoals?

A. I call them input leads or drop lines.

Q. You call them inputs leads or drop lines?

A. Input leads or drop lines.

Q. Input leads or drop lines. Okay.

And does Shoals call them drop lines in the ordinary course of their business, like if we were to look at their marketing documents, their internal documents, would they say drop lines?

A. I believe so.

Q. And you call them either input leads or drop lines, that's your testimony?

A. Yes.

Q. Okay. Does Shoals also refer to them as branches?

A. You could refer to them as branches. Some people do.

Q. I'm not asking if I could. I'm asking does Shoals refer to the inputs, input leads that you just said, as branches in its documentation?

A. I don't recall off the top of my head, but I refer to them as input leads.

Q. Sitting here today, as a corporate representative, you've been at Shoals for I guess, in the aggregate, about a decade; is that right?

A. A little bit more, yeah.

Q. Okay. You were there from 2010 to 2014, you left, you came back in 2017, and then you've been there since, right?

A. Yes.
Q. And so over this time period, over the last decade, is it your testimony that since BLA has been around Shoals calls those input leads, either input leads or drop lines?
A. Yes.
Q. Okay. It doesn't call them branches.
A. I don't believe so.
Q. And so, for example, if we were to go through your documentation, your emails, your communications, when you're communicating with customers, when you're communicating internally, it's your testimony that you refer to those as either input leads or drop lines. Do I have that right?
A. Yes.
Q. Okay. Now did that change over time or has that always been the case for Shoals?
A. Always referred to them as input leads or drop lines.
Q. Now you talked earlier about wire harnesses. I think you called them wire harnesses or component harnesses; is that right?
A. Yes.
Q. Okay. And I understand that, from your testimony, a wire harness, as one example, could be, let's

say it's a cross-joint? Okay? Are you familiar with a cross-joint?

A. Yes.

Q. A cross-joint would have four inputs, right?

A. Not always.

Q. Not always. When would it not have four inputs?

A. Four across could have one output and three inputs (demonstrating). If it had two inputs, three inputs -- I'm sorry -- three inputs and one output, it will never be the first example that you said.

Q. I think I understand. It kind of depends on the flow of current. You might have -- there is four holes either going in or out of an area that you would call an interconnect point, right?

A. In or out.

Q. You can call that an interconnection or a joint, these are all terms that you've used and Shoals uses, right?

A. Yes.

Q. So let's take the situation where you have a cross-joint, similar to what your counsel showed, I'm going to try to stay on the public record right now so I don't want to put up the document, but earlier you were testifying, I believe you called it a 14-string negative wire harness; is that right?

A. Yes.

Q. Okay. And that's actually the document we were looking at, we talked about in your deposition, but that's generally -- it's one example of a wire harness that Shoals sold in the U.S. market in the 2010-2012, 2013 time period, fair?

A. Similar.

Q. Right. You could have more strings, you could have less strings, right?

A. Yes.

Q. I think what you showed, and those have branches, right?

A. Yes.

Q. The branches can come in different sizes, 8, 10, 12, AWG, right?

A. Yes.

Q. Okay. And the trunk, the trunk cable, could also come in different sizes, right?

A. Yes.

Q. And you would refer to those as wire harnesses, right?

A. Yeah.

Q. Okay. And it's a wire harness because it's taking electric current from two or more places and combining them together, would you agree?

A. From two or more places is what you said?

Q. There's two or more inputs of current and combining them together.

A. Yes.

Q. That's a characteristic of a wire harness, right?

A. Yes.

Q. Okay. And the BLA does the same thing, you would agree? You could have current coming from two or more inputs into the mold drop and combining them together, you'd agree, right?

A. You would need to use a wire harness for that as well.

Q. You're saying that for the BLA the two inputs would come from two wire harnesses.

A. If you have two inputs, yes.

Q. And then they would go into the BLA and the current would combine together there, right?

A. Yes.

Q. So in both instances your wire harness or your component wire harness and your BLA have two or more inputs of current being combined together in an interconnect point, and then into a larger cable.

Would you agree?

A. They both -- I think they're two separate functions.

Q. I'm just -- sorry. Go ahead.

A. Two separate functions.

Q. Okay. Just talking about the basic function of current flowing and combining together at an interconnect point and then into a larger cable, kind of like two streams of water flowing into a larger stream or river.

Would you agree that both the component harness and Shoals' BLA both do that for current generated from solar panels?

A. In the example that we showed, it had all 10-gauge wire on it on the wire harness.

Q. That's not what I'm asking you. Just focus on the question, right?

I'm just asking you, okay, your component harness or your component harness could have two or more branches, right, and a trunk, and you would take current from solar panels coming down into an interconnect point and into the trunk.

You would agree, right?

A. Yes.

Q. And it's combining current, the current is combined to the interconnect point and then on to another cable, right?

A. Yes.

Q. And the same thing happens with the BLA, right? The BLA has two or more cables, it's taking energy/current

generated from solar panels and then combining it together in the mold drop where there's also an interconnect point and then on to another cable, right?

A. We have the compression lug, yes.

Q. Sure. You have the compression lug holding together and helping the electrical connection, right?

A. Yes.

Q. You also have something that's helping the electrical connection in the joint, in the wire harness that we just talked about, right?

A. I would say it's not helping it, but we are securing the internal with a resistance.

Q. Okay. Either way, you're doing something so that the electrical connection between the conductors in the wire harness, the component wire harness, and the conductors in the BLA, they are coming into electrical contact together, right, so that the current, when it combines together, it combines and then goes along the path of the current into wherever it's going next.

Would you agree?

A. Yep.

Q. Okay. But it's your testimony that because of where the interconnection device or joint -- you'd agree that they are both joints, right?

A. They are points of connecting two cables together

or more, yes.

Q. Okay. Both the BLA and the component wire harness are joints, right?

A. Yeah.

Q. Okay. And they are both joints that will take current from branches and then combine them into trunks, right?

A. The wire harness has branches. The BLA has the drop lines or inputs leads.

Q. Okay. And you differentiate the BLA from the wire harness because the BLA does not -- does not go to a combiner box, right?

A. I differentiate the two because the BLA needs wire harnesses to interface with the DC feeder cable of the BLA via the input drop lines, input leads or drop lines, and then from there that DC feeder cable continues to the DC disconnect box.

Q. The BLA goes straight to the disconnect box and then to the inverter, right?

A. Yes.

Q. It doesn't go to the combiner box. You don't need one, right?

A. No.

Q. A wire harness can also go directly to an inverter, you would agree, right?

A. A wire harness could go to a string inverter.

Q. Okay. So a wire harness could go to a string inverter.

Does a string inverter also just convert the DC into AC in the same way that an inverter does?

A. You do need a home run on that, by the way, but a string inverter does convert DC to AC on a much smaller scale.

Q. Putting smaller scale aside, you can also use a wire harness and connect directly to an inverter without a combiner box.

You would agree, right?

A. You need a home run, but yes.

Q. And a home run is just a cable, right?

A. Yes.

Q. So you need a cable in both -- so if you have your BLA and then you have your disconnect box, there's a cable that's connecting the mold drop to the disconnect box, right?

A. There's a compression lug that is connecting the input leads or drop lines to the DC feeder and then to the disconnect box, yes.

Q. Okay. And so there's a cable that's taking the current, again, into the inverter, just like the current from a wire harness will go to a string inverter in that

application, right?

A. I'm sorry. I'm not following you.

Q. I'll come back to it.

A. Okay.

Q. Are all of your wire harnesses made with the same branch diameter and the same trunk diameter?

A. Are all of the wire harnesses made with the same trunk diameter and same --

Q. Branch diameter.

A. Typically, yes.

Q. Typically yes. There's three options, I guess, three scenarios. Your branch diameter and your trunk diameter could be the same or the branch could be greater or the trunk could be greater; is that right?

A. The branch would be -- would never be greater, but --

Q. Okay.

A. Yeah.

Q. Then two scenarios. Either your trunk diameter is greater than your branch diameter or your trunk diameter is the same as your branch diameter.

You'd agree?

A. Yes.

Q. I want to go back to -- there was a document that you had up that had the opportunities for BLA, right? It

had a specific code for opportunities for the BLA. It was on your purchase order.

Do you remember that?

A. It was a quotation.

Q. The quotation, okay.

Does Shoals do that also with its component wire harnesses?

A. Does Shoals use the -- I'm sorry, what was the --

Q. Yeah, the same tracking system, right, where you assign a number to the quotation for the opportunity, does Shoals do that for the component harnesses as well?

A. It has a different prefix, same six-digit code.

Q. And since you've been at Shoals the whole time period, right, since you were gone for a period of time, approximately how many opportunities has Shoals had for those to sell component harnesses?

A. Thousands.

Q. Ten thousand? Five thousand?

A. I'd be speculating on a number. Thousands.

Q. Is it more or less than -- is it closer to ten thousand or five thousand, just ballpark for me?

A. Total on the history of Shoals, just wire harnesses.

Q. Since you've been there, since 2010.

A. I would say over five thousand.

Q. Okay. And then per year, are we talking about, then, several hundred, close to a thousand opportunities?
A. I'd say in the thousands for opportunities.
Q. Every year.
A. Yeah.
Q. Okay. Now let's focus in on the 2010 to 2014 time period. Okay?
In that time period, about how many opportunities were coming by Shoals to sell component wire harnesses?
A. I don't recall off the top of my head.
Q. Can you just ballpark for me? You said thousands over the whole time of your career. You've got to have a sense of how much you were selling now versus then, your best guess.
A. I don't want to speculate for you. The market has grown tremendously over the last decade, so --
Q. More than a thousand?
A. I don't know for certain.
Q. More than five hundred?
A. I don't know that number off the top of my head. I'm sorry.
Q. Best guess.
A. I don't know that number.
Q. Would it be like less than a hundred?
A. I'm not sure.

Q. You really have no idea.
A. (Shaking head from side to side.)
Q. Okay. Are there records within Shoals that would be able to tell you how many opportunities Shoals has had to sell component harnesses during that 2010 to 2014 time period?
A. I don't believe so.
Q. You don't believe so. No records exist?
A. I don't believe so.
Q. Have you checked?
A. Not me personally.
Q. Okay. From the time of your deposition to now, was there any further research that you did on, for example, the topics that you testified about to prepare for today's deposition or today's testimony?
A. No.
Q. No. Okay.
I believe Mr. Harris asked you during your direct whether or not Shoals had sold a wire harness in the 2010 to 2014 time period that had two molds, and you said it had not, right?
A. I believe you said one mold.
Q. I'm sorry. Said one mold and you said they have.
A. For BLA. I believe you said has Shoals ever sold a BLA with one mold on it.

Q. We'll check your testimony in a minute.

Let's talk about the wire harness, okay? Your wire harness in the 2010 to 2014 time period, did that have one mold or two molds?

A. On the wire harness?

Q. Yes.

A. It depends on the application.

Q. Maybe you're confusing me. So I'm referring to your products have an undermold and an overmold, right?

A. Oh, I'm sorry. Okay. Yes.

Q. That's what I'm talking about. So if you think about undermold and overmold, if I use a term double-molded, does that help?

A. Undermold and overmold, I understand that.

Q. Okay. At some point in time Shoals started selling wire harnesses or joints, the cross-joint, the T-joint, with double-molded, right?

A. Yes.

Q. And at some point before that it only had one mold, you can call it an overmold maybe, for those joints; is that right?

A. Yes.

Q. Okay. And I thought your counsel asked you whether or not before 2014 had Shoals ever sold a joint that was double-molded and you said no.

Did I mishear that?

A. I said that in the time frame of 2010 to 2014 we used one mold.

Q. You used one mold.

A. Yes.

Q. Meaning there was not an undermold and an overmold, there was just one mold.

A. Correct.

Q. And at some point after 2014 you just don't know when Shoals then went to undermold-overmold manufacturing process; is that right?

A. Correct. I was gone by then.

Q. And so you don't know when that happened, but you're confident now that that happened after 2014, right?

A. Yes.

Q. And that's not based on any further research, further analysis, further looking at documents since we last were together at your deposition?

A. No.

Q. Can we pull up the deposition, Mr. Brooks? Let's go to page 121.

Do you see, Mr. Macias, in your deposition I asked you:

Sounds like you don't know, which is fine, when is it that Shoals began using an undermold and overmold in

its interconnect joints?

That's what I asked you, right?

A. On line 7?

Q. On lines 7-11.

A. Okay.

Q. Right? I asked you, do you know when Shoals started using both an undermold and overmold, and you said you didn't know, right?

A. Yes.

Q. Okay. Now let's go to page 69, line 13. This is earlier in the deposition.

In your first stint at Shoals, so that's 2010 to 2014, those interconnection points, were they -- at that time did they have both an inner mold and an overmold?

And you said "I don't recall."

Right?

A. Yes.

Q. So at your deposition you weren't sure whether or not those interconnect points from 2010 to 2014 had an undermold and overmold or just an overmold, right?

A. Correct.

Q. Okay. So what I want to know is, when your counsel asked you today, when you were unsure in December, how is it now that you were sure that prior to 2014 there's only an overmold?

A. We only used the overmold at the time. There was no undermold.

Q. Okay. How do you know? What's that based on?

A. We used plastic to paint it on as the underlayer and then we had an overmold.

Q. Okay. So your testimony is, before 2014, for your interconnect points for those joints, you used a -- like a paint?

A. A paint, yeah.

Q. A paint and then you would put in overmold, so that's one mold, right?

A. Correct.

Q. And what you just described is also disclosed in one of Shoals' other patents, right, not the '153, but one of Shoals' other patents, the painting and then the overmold.

A. Okay.

Q. Do you agree?

A. I'd have to look at the exhibit.

Q. Okay. Let's go to RX-96.

A. Which one?

Q. It should be in your binder, but it's RX-0096 and we'll also put it up on the screen.

Mr. Macias, this is one of the documents we talked about in your deposition as well. This is the

Provisional Application that led to the '254 and the '153 patent.

Do you recall us talking about the Provisional Application during your deposition?

A. Is it all of the documents --

Q. Should be.

Do you recognize that document?

A. I believe so.

Q. Let's go to page 22. Mr. Macias, page 22, this looks like some marketing literature from Shoals regarding its BLA Trunk Bus; is that right?

A. Okay.

Q. Would you agree this is some marketing literature from Shoals regarding Shoals' BLA Trunk Bus?

A. I don't know if it came from a marketing document, but it appears to be something in marketing, yeah.

Q. You won't dispute that it's from Shoals, though, right?

A. I don't believe so.

Q. And it's describing Shoals' BLA Trunk Bus, right?

A. Yes.

Q. Do you see the second line, the second sentence, it says, "This pre-manufactured harness offers a significant cost savings"? Do you see that?

A. This pre-manufactured harness offers a

significant cost savings, yes.

Q. All right. You'd agree in this document Shoals is referring to its Trunk Bus as a pre-manufactured harness, right?

A. Yes.

Q. And then if you look at the next sentence, it says, this system utilizes the same under/overmold construction currently deployed in the field today, but on a much larger scale.

Do you see that?

A. Yes.

Q. Okay. And I know your counsel asked you earlier about the different EBOS components that Shoals sells, and you confirmed, for example, Shoals doesn't sell solar panels, right?

A. Yes.

Q. It doesn't sell trackers?

A. Yes.

Q. It doesn't sell inverters.

A. Yes.

Q. Right. It sells combiner boxes, it sells harnesses, it sells cables in a solution together, right?

A. Yes.

Q. And before 2014 Shoals was selling wire harness solutions in solar, right?

A. Yes.
Q. Those were the solutions that were deployed in the field for its customers, right?
A. Yep.
Q. Okay. And so in this document, doesn't this tell you that the harnesses that were being used before 2014 by Shoals had both an undermold and an overmold?
A. No.
Q. Protecting the joints?
A. No.
Q. It doesn't.
A. On the wire harnesses?
Q. Yes.
A. All it says is this system utilizes the same under/overmold construction currently deployed in the field today, but on a much larger scale.
Q. Okay. Well, what else could it be? Any idea?
A. Speculating.
Q. Sitting here today you don't know?
A. It doesn't say as wire harnesses on there, so I would be speculating.
Q. It could be the wire harnesses, right?
A. It may.
Q. And anything else that it could possibly be referring to, you only were selling so many components

within the EBOS system, right?

A. I believe we had connectors as well.

Q. And when you say connectors, what are you referring to?

A. Shoals at one point made their own connector.

Q. It's your testimony that you think that this under/overmold construction might be referring to the photovoltaic connectors that are at the end of a cable like what you just showed in your BLA?

A. It's not definitive.

Q. I'm just asking whether or not you believe that to be true. You think it's possible?

A. It's not definitive.

Q. You think it's possible, though?

A. It may.

Q. More likely than not?

A. More likely than not what? I'm sorry.

Q. More likely than not -- okay. So let's --

You have undermold-overmold construction and we're trying to figure out what this document that Shoals filed with the Patent Office is referring to. Okay? And I understand that you may not -- you're not sure.

A. Yep.

Q. So it could be the wire harness, you would agree? The undermold-overmold construction could refer to the wire

harness, right?

A. It could.

Q. It could refer to, as you just speculated, the connectors, the photovoltaic connectors, right, you're saying that's one possibility? Yes?

A. Yes.

Q. Is there anything else that this under/overmold construction could possibly be referring to within the system and solutions that Shoals was offering before 2014?

A. Not that I can recall.

Q. Okay. And just sitting here, do you recall Shoals actually ever making a photovoltaic connector like the one right there that would be made with both an undermold and an overmold?

A. I don't recall if it had two, a two-part construction.

Q. Okay. And this says that the system utilized same under/overmold construction but on a much larger scale.

Do you have any idea what that's referring to?

A. I'd be speculating on that.

Q. Okay. You don't think that that is referring to the BLA being a wire harness, like your component wire harness on a much larger scale?

A. It could.

Q. What else could it be? Any other guesses?

A. I mentioned a connector, but I don't know for certain.

Q. Okay. You think that it could possibly be just connectors on a much larger scale?

A. It could be on a bigger scale.

Q. Sitting here today, do you believe that this sentence is referring to connectors as opposed to the wire harnesses being deployed in the system on a much larger scale?

A. It's not specific.

Q. You don't know one way or the other.

A. Yeah. This document was -- I think it was filed on September 9, 2014. I was gone by then.

Q. Okay. Is there anyone at Shoals still -- I know several people have moved on -- but anyone at Shoals that you can think of that would know whether or not, for example, if Shoals actually made the photovoltaic connectors made of an undermold and overmold material?

A. Not that I can recall.

Q. Are you familiar with something called an Intertek Report?

A. Yes.

Q. I know your counsel asked you, you're not an engineer, right, but is the Intertek Report, is that something that you're familiar with?

A. At a high level, yes.
Q. At a high level. Is it something that you look to, you know, you use in the ordinary course of your work?
A. Our products need to be certified to sell to our clients.
Q. Okay. Have you ever viewed an Intertek Report?
A. I have, yes.
Q. And you understand that the Intertek Report would tell you, for example, the materials that are used to make various components within that are described in the Intertek Report, right?
A. Can you repeat that?
Q. Sure. The Intertek Report would describe the materials that are used to make the components that are described in that report, would you agree?
A. I don't know that that's entirely accurate.
Q. Okay. Well, if Shoals made photovoltaic connectors and those photovoltaic connectors were described in the Intertek Report, or one of the components discussed, you would expect that it would tell you whether or not, for example, it was made with an undermold and an overmold, right?
A. It may.
Q. Okay. But before today you had not looked at the Intertek Report to determine whether or not photovoltaic

connectors were made with those both materials, right?

A. No.

Q. And then you also don't know whether or not that Intertek Report would, for example, tell you if the wire harnesses before 2014 were made with both undermold and overmold material, right?

A. I don't recall.

Q. You would agree, though, that if we looked at the Intertek Report, that would be a reliable document that would provide that information within Shoals?

A. Yeah, it may.

Q. Okay. So, for example, if that document said that the wire harnesses were made with both an undermold and overmold before 2014, your prior testimony would be wrong, right?

A. Okay.

Q. Would you agree?

A. If that's what it said.

Q. It's either your memory or the Intertek.

Which one do you think is more reliable?

A. I don't know.

Q. Fair enough. Now earlier your counsel also asked you --

MR. OU: Your Honor, could we go on the confidential record?

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Back to the public record.

BY MR. OU:

Q. Mr. Macias, one of the documents that your counsel asked you about earlier, I think it was CX-235C, it's the data sheet for the Big Lead Assembly.

Can you find that, please? Can we put that on the screen, CX-235C.

MR. SHIN: Your Honor, could we clarify whether this is confidential or not?

MR. HARRIS: We removed the confidentiality. The C was by accident on this exhibit, so there is no confidentiality problem here.

JUDGE BHATTACHARYYA: Thank you.

MR. HARRIS: Thank you.

A. CX-235?

Q. Yes.

A. I don't believe --

Q. It is probably in the binder that Mr. Harris gave you.

A. Oh. Okay.

Q. So, Mr. Macias, this is a BLA spec sheet, right?

A. Yes.

Q. And there's a section called Features.

Do you see that?

A. Yes.

Q. And the fourth bullet says, "patented undermold-overmold process chemically bonds and hermetically seals joints."

Do you see that?

A. Yes.

Q. What is that referring to? Do you know?

A. I believe it's referring to the undermold and overmold of the mold drop.

Q. The undermold and the overmold of the mold drop. And it says it's a patented process.

Is that a patented process for forming that undermold/overmold mold drop, do you know?

A. I don't know.

Q. Are you familiar with the '153 patent that's the patent that's still at issue in this investigation?

A. Yes, I believe so.

Q. I'm not going to ask you details of the claims or anything like that, but you have some familiarity with it, right?

A. It pertained to the undermold and overmold, yes.

Q. Are you aware of the '153 patent having any claims that are to patented processes that would chemically bond and hermetically seal the joint inside the mold drop?

A. I don't recall.

Q. Okay. As far as you know, this bullet point in Shoals' marketing documents isn't referring to the '153 patent, right?

A. I don't know.

Q. Okay. It's not referring to the '254 patent?

A. I don't know.

Q. You don't know. When I took your deposition I think you said that the undermold/overmold, that characterization or characteristic of Shoals' BLA, that was a differentiator for Shoals, right?

A. Yes.

Q. A differentiator from other companies that sold EBOS solutions in the solar market, right?

A. Yes.

Q. Does Shoals believe, do you believe, on behalf of Shoals, as a salesperson, someone that talks to customers all the time, that Shoals has a monopoly over EBOS solutions that use a double-molding process?

A. No.

Q. Okay. You don't -- do you believe that Shoals invented double-molding?

A. I don't know.

Q. Do you believe that Shoals invented double-molding in solar?

A. I don't know.

Q. You don't know one way or the other, right?
A. (Nodding head up and down.)
Q. Is it possible that another company such as Voltage or another company could develop its own trunk bus or cable assembly using different materials, using different methods of sealing the joints that would be different from Shoals' BLA?
A. Okay.
Q. You would agree that's possible?
A. They could use different material.
Q. That they could use different materials, they could have a different design, they could use a different way of sealing the joint protecting it from environmental factors. A company could independently develop that on its own, you would agree, right?
A. Okay. Yep.
Q. And if it did, it wouldn't be copying Shoals' BLA. You would agree, right?
A. It wouldn't be copying Shoals' BLA.
Q. Right.
A. A mirror image of it.
Q. It's a mirror image just because --
A. It looks like BLA.
Q. Visually.
A. Yes.

Q. Okay. And so if -- your view is that -- let's be specific to Voltage -- I think you testified that, when you saw Voltage's LYNX product, you believed that Voltage copied Shoals' BLA, right?

A. In my deposition?

Q. Yes.

A. I believe that's what I said in my deposition.

Q. And do you still believe that today?

A. I believe that copy is probably not the right word. It looks like it's definitely a mirror image of it from aesthetics, yes.

Q. You don't believe that -- you don't believe that Voltage, for example, obtained Shoals' BLA product, cut it open, analyzed it, and then decided I'm going to make a copycat of it, I'm going to copy it. You don't believe that happened, do you?

A. I don't know.

Q. You don't know one way or the other.

A. (Shaking head from side to side.)

Q. Okay. It's true, Mr. Macias, that when Shoals was getting hurt in the market, you hired Maschoff Brennan, a law firm, right, that happened?

A. (Nodding head up and down.)

Q. And they asked you to go get a Voltage LYNX Trunk Bus product, right?

A. Yes.
Q. And you did that, right?
A. Yes.
Q. Where did you get it from?
MR. HARRIS: Objection. This calls for attorney work product. We've had this discussion in the deposition and came to an agreement that this wasn't going to be an issue here.
JUDGE BHATTACHARYYA: Mr. Ou?
MR. OU: Your Honor, they made a claim of privilege in a deposition. I moved on from the deposition. I don't think I ever agreed that we agreed with their attorney-client privilege objection and instruction. We think it's improper, Your Honor.
MR. HARRIS: We have an agreement on the record, Phil. It's at the end of the deposition.
MR. OU: Okay. And that's a deposition. That's a question/answer.
MR. HARRIS: You said --
(Clarification requested by the court reporter.)
JUDGE BHATTACHARYYA: As I understand, it was an agreement, but you're saying it only pertained to the deposition, but now you're doing something separate and you can ask him these questions.
MR. OU: Yes, Your Honor.

JUDGE BHATTACHARYYA: And, Mr. Harris, you're objecting on the grounds of attorney --

MR. HARRIS: Attorney work product. We were instructed -- he was instructed by counsel to go get the product, the specifics of that are covered. We had a disagreement with Voltage's counsel at the deposition. We agreed that this wouldn't be an issue further in this case or in the follow-on district court cases if we agreed not to bring up the issue, and we didn't during direct, or any other time. So the agreement should stand.

MR. OU: Your Honor, may I respond?

JUDGE BHATTACHARYYA: Yes, you may.

MR. OU: I'm happy to pull the transcript, Your Honor. I asked the question. He was given an instruction not to answer. We said we disagreed with that.

The question became whether or not Shoals would argue that Voltage copied the BLA product, and we have deposition testimony from Mr. Solon that's going to get played after Mr. Tolnar where they have designated the testimony where Mr. Barquist asked Mr. Solon, do you think that Voltage copied Shoals' product, and he said yes.

So they brought copying into the investigation. That's the only reason at that time I said let's not fight about the objection, let's move on, I've got other questions to ask. So we're at the hearing. He is under oath. I

disagree that that's a proper instruction. I think the witness should answer the question.

MR. HARRIS: Your Honor, may I read our agreement from the record at the deposition?

JUDGE BHATTACHARYYA: Okay.

MR. HARRIS: Mr. Barquist said:

"Just before we conclude, just to address your concern, Phil, and without rehashing the objections, and whatnot, we will represent on behalf of Shoals that we would not at the hearing of this case or otherwise in this litigation offer or seek to offer this customer comment that Mr. Macias has mentioned about the customer's concern. So if we won't be offering that, I think that would resolve the issue.

"Mr. Ou: Just to clarify, because you said this in this litigation, are you limiting it to this investigation?

"Mr. Barquist: Well, to this, yeah, I mean, it would include the follow-on district court case, yeah.

"Mr. Ou: Sorry, just one other point of clarification. Is Shoals going to offer any testimony on behalf of any of its witnesses about alleged evidence of copying for any issue such as secondary considerations of non-obviousness or any mens rea related to indirect infringement?

"Mr. Barquist: Well, again, I think the only copying evidence is the inference that one can draw from the facts that we're aware of, that they were aware of the product, they were aware of our patent, but, other than that, I mean --

"Mr. Ou: And so the statement that was given by Mr. Macias on what allegedly heard from a customer that is not going to form the basis for anything?

"Right.

"Mr. Ou: I think with that we probably have our issue resolved. Obviously we'll reserve our rights if something changes, but that will conclude our deposition."

So Mr. Barquist said the only evidence of copying that we would talk about is drawn from the facts of how the product looked and that they're aware of our patent. There is nothing that Mr. Macias has said contrary to that. And so this issue has already been resolved by agreement of counsel.

MR. OU: Your Honor, if I may?

JUDGE BHATTACHARYYA: Yes. Please go ahead.

MR. OU: Number one, the issue is not resolved, because specifically -- this was not limited to just whether or not Mr. Macias was going to say something about a customer. They have alleged -- Mr. Harris said in his opening statement, he called Voltage's product a copycat

product.

MR. HARRIS: I did not say that. Those words did not leave my mouth.

MR. OU: You said something very, very similar. We can check the transcript.

Regardless, Your Honor, it's an improper instruction. The attorney-client privilege is -- or work product, they don't have a basis for claiming work product. But, Your Honor, we think the instruction is improper. If it's sustained or if the objection or if the instruction is allowed, then, Your Honor, I'll move on.

JUDGE BHATTACHARYYA: Just aside from any agreement that might have taken place, Mr. Harris, what's your basis for asserting work product or attorney-client privilege?

MR. HARRIS: The work product was Mr. Macias did what he did to get a product and an analysis of that product, and how he got it and who he got it from, that was all at the direction of counsel under the attorney work product, and, therefore, that should be protected under that.

Now, I mean, what we have is products that have been produced all over the place at this point. So how he got that sample and how that sample was analyzed, et cetera, is all still attorney work product. It hasn't been

disclosed.

JUDGE BHATTACHARYYA: Does the Staff have a position, Mr. Shin?

MR. SHIN: Your Honor, Mr. Harris's proffer of attorney work product, that reasoning satisfies the Staff, and therefore Staff would side with Shoals to -- in their objection and to move things along as well.

JUDGE BHATTACHARYYA: Okay. The objection is sustained.

MR. HARRIS: Thank you, Your Honor.

JUDGE BHATTACHARYYA: Mr. Ou, if you have a lot more, I wonder if we could take a quick break.

MR. OU: Yeah, I wasn't sure where we are.

JUDGE BHATTACHARYYA: Let's take a 15-minute break.

MR. OU: Thank you, Your Honor.

(The hearing recessed at 3:53 p.m.)

(In session at 4:09 p.m.)

JUDGE BHATTACHARYYA: Please be seated.

We're on the public record.

MR. OU: I'll just have a few more questions, and then I'm actually going to pass it to Staff.

JUDGE BHATTACHARYYA: Okay.

MR. OU: Your Honor, may I proceed?

JUDGE BHATTACHARYYA: Yes.

BY MR. OU:

Q. Mr. Macias, I'm almost done, so bear with me, please.

Earlier you testified, your counsel asked you about the sales of one-drop BLAs. Do you remember that, that question?

A. Yes.

Q. You would agree that, when the BLA was first introduced to the market, the only options were one drop or two drops, right?

A. I don't recall.

Q. Sitting here, you just don't know one way or the other.

A. Yeah.

Q. And you don't remember -- do you remember when Shoals introduced the four-drop BLA such that you could have anywhere from one to four drops?

A. I don't recall off the top of my head.

Q. I think you said that the structure of the different mold drops, whether it's one, two, three, four, five, six inputs, the structure, you believe, was all the same. There were no differences other than the number of inputs. Was that your testimony?

A. Yes, they are fundamentally the same.

Q. Now, in coming to that conclusion, did you study

the manufacturing process or any manufacturing documents to arrive at that, or is that just based on your experience as a salesperson at Shoals?

A. I'd say the latter.

Q. And I think that you said that in, for example, if we take the two-drop mold drop scenario at the bottom that we have at CX-235.1, that has -- that's a mold drop with two inputs, right?

A. Which one? Is it this one you're referring to?

Q. Yes.

A. That's a two input lead, this one.

Q. Right, the two input lead mold drop that we're looking at, CX-235.1, do you know whether or not those two inputs are made with a single cable or two cables?

A. I don't know off the top of my head.

Q. You don't know one way or the other?

A. Correct.

Q. And is it also correct that you don't know whether or not that cable or cables that form the inputs get compressed into the cable of the larger DC feeder cable such that its pathway disappears?

A. I don't believe that the input leads go into the same spot in the compression lug.

Q. The compression lug has a specific separate spot for the cable or cables that form the inputs than the cable

that forms the DC feeder cable; is that right?

A. Yes.

Q. Okay. So there's actually a physical barrier that separates the two; is that right?

A. There is separation between the two seats.

Q. Understood. Thank you, Mr. Macias. I'm going to pass you off to Staff.

EXAMINATION BY COUNSEL FOR ITC STAFF

BY MR. SHIN:

Q. Good afternoon, Mr. Macias.

A. Good afternoon.

Q. You recall we spoke during your deposition. Do you remember that?

A. Yes.

Q. I have some follow-up questions for you.

Counsel showed you two physical exhibits, CPX-36 and CPX-36.1, the physical exhibits.

A. Oh. Yes.

Q. And now have you ever seen a slice-through before, or is this sort of the first time during this investigation?

A. I've not seen this sliced. This is the first time during this investigation.

Q. Or other similar slice-throughs?

A. I'm typically not involved in the engineering

part of this.

Q. Okay. CPX-36 is a four drop line BLA; is that right?

A. Yes.

Q. And the slice-through is also of a four drop line BLA; is that right?

A. It appears so, yes.

Q. Okay. Earlier you testified or you described the components in that slice-through. You described the feeder cable that goes all the way through the undermold?

A. Yep, this one (indicating).

Q. It goes all the way through from the left to the right; is that right?

A. Yes.

Q. And do you know what it's made of?

A. This is made of aluminum.

Q. And you also described the branch wires. There's one branch wire right under there, which you called drop line 1, right?

A. Drop line 1, yes.

Q. And that's a different material. Is it made of copper?

A. This is made of copper, yes.

Q. Okay. And is it correct that the copper wire that you're pointing at goes from the left to the right

completely through the molding?

A. Yes, it appears so.

Q. And it goes into the compression lug as well, right?

A. Yes.

Q. And it's not crimped in the compression lug, is it?

A. I believe it is crimped.

Q. It's deformed?

A. I believe there are two separate seats the aluminum cable goes into, and then the copper cables go into the other seat underneath, and then they are crimped.

Q. Okay. But, I mean, because there's a, what you call a seat, it's not completely deformed; is that fair to say?

A. When you say "completely deformed," just to clarify, are you talking about the compression lug or are you talking about the cabling?

Q. The cable, the copper wire that we were talking about, the copper wire goes all the way through. It's not, like, cut in half or something because it's crimped.

A. No, not cut in half.

Q. And then you also described the copper wire below that, and I think you identified it as drop line 2, right?

A. Correct.

Q. And that copper wire also goes all the way through the molding from the left to the right.

A. Yes.

Q. And it also goes through the undermold.

A. Yes.

Q. I'm sorry. It also goes through the compression lug.

A. Yes.

Q. And did you describe to counsel earlier that the copper wires do not touch the aluminum feeder cable?

A. Can you repeat the question?

Q. Did you tell counsel that the copper wires do not touch, and, therefore, are not in physical contact with the feeder cable?

A. Correct.

Q. All right. And are the two copper wires themselves in contact with each other?

A. It appears so, yes.

Q. Okay. It appears so or, I mean, is that how it's engineeringly designed?

A. I believe it's in the same seat.

Q. Okay. Can we put up the exhibit?

I'd like to direct your attention to the exhibit your counsel used, CX-235. It's marked confidential, but your counsel has identified that it is not confidential.

Counsel just went through these six images. Now this is a -- it is a technical document relating to the BLA; is that right?

A. Yes, this is a data sheet.

Q. Okay. And is it available to the public?

A. Yes.

Q. On Shoals' website?

A. Yes.

Q. And this particular version is dated in, I think, March 6, 2023; is that right?

A. It appears so, yes.

Q. And so this is a new version of it.

A. Yes.

Q. These are the current products that Shoals sells for BLA.

A. I'm not sure that this is the current, most current one on our website today. I'm not sure.

Q. Are you aware of updates that -- where Shoals sells new models?

A. I believe there may have been a modification to the max trunk size, max trunk cable size.

Q. What does that mean?

A. The DC feeder cable sizing, this one (indicating), we increased it --

Q. Okay.

A. -- as an option.
Q. Earlier you testified to your counsel that the same machine gets used to make all the molding; is that right?
A. Yes.
Q. And you also testified that there's no change in the body of the mold drop; is that right?
A. Yes, I believe so.
Q. And because you pointed to CPX-36 where there are four drop lines, and you pointed to additional sort of placeholders for additional drop lines, right?
A. Yes.
Q. So that CPX-36 could potentially hold up to eight drop lines.
A. Yes.
Q. And so you believe, based on viewing that, that the same mold would be used for, let's say, for a one drop line; is that right?
A. It could.
Q. Is it?
A. I don't know for certain.
Q. Okay. If we look at the exhibit, when we look at the size of the moldings, do you see that the size of the molding for the eight drop line is different from the size of the molding for the one drop line?

A. It looks slightly different.
Q. Slightly different? The molding is different, right?
A. It appears to be different.
Q. It's a different size molding, right?
A. (Nodding head up and down.)
Q. Is that yes?
A. Yes.
Q. The molding changed.
A. (Nodding head up and down.)
Q. So at least between 8 and 1, the molds are different, and between, let's say, 8 and 6, the molding also appears to be different, right?
A. Yes.
Q. Okay. And you also testified that there are 5 and 7 drop line BLAs. But at this point you can't say that all the molding is the same for all the BLAs; is that fair to say?
A. Correct.
Q. Okay. And you don't -- you don't know what's underneath these BLAs from this picture, do you?
A. When you say under these BLAs, what are you referring to?
Q. Well, you know sort of the general components of the BLA, right?

A. Correct.
Q. And you thought that all the molding was going to be the same.
A. Okay.
Q. But now you know it's not, right?
A. Correct.
Q. Okay. And what's underneath the molding, you know what the components are, but you don't know necessarily that the components stay the same. I mean, certainly the wires, the cables, they change size, right?
A. Correct.
Q. But the compression lug, do you know if the compression lug changes?
A. I don't know for certain.
Q. Okay. You looked at the compression lug in the slice-through and it appeared to hold two copper wires, right?
A. Yes.
Q. Can you tell me that that same compression lug holds six or eight drop line wires?
A. Not definitively.
Q. Okay. So is it possible that the compression lug also changes?
A. It could have.
Q. And the way the wires will go in might change as

well.

Counsel earlier, Voltage's counsel, pointed you to the two drop line embodiment, and you testified that you don't know whether one wire is used to form those two drop lines or not, right? It could be two separate wires?

A. Yeah.

Q. Right? Are you aware of a two drop line embodiment --

JUDGE BHATTACHARYYA: Mr. Macias, when you give your answers, could you make sure to say them so that it appears in the transcript? Thank you.

Q. So, Mr. Macias, for the two drop line embodiments shown in this exhibit, are you aware of any other two drop line embodiments that Shoals makes and sells?

A. I believe there could be one that has input lead on -- two inputs on one side or on the other.

Q. And that's not the same as this two drop line embodiment.

A. No.

Q. Is that fair to say?

A. Correct.

Q. And you don't know how the wire, the copper wire, that goes into that other embodiment, how it plays out, whether it's one wire that goes through and snakes back out or if it's two separate wires.

A. No, I don't.
Q. So there's a lot of different embodiments, right --
A. (Nodding head up and down.) Yes.
Q. -- that use different molds, right?
A. Yes.
Q. That probably -- possibly use different compression lugs?
A. They may.
Q. And use different wires to the extent they go partially through or completely through the molding.
A. Correct.
Q. All right. Now moving on, you are an -- you are the chief revenue officer, and your background is sales and marketing, right?
A. Sales.
Q. Okay, sales.
A. I'm in charge of marketing as well. Primarily sales.
Q. And you told your counsel that you're not an engineer.
A. Correct.
Q. And you haven't worked at Shoals in any engineering capacity.
A. No.

Q. Nor in their manufacturing teams.
A. No.
Q. And so you're not as familiar with their manufacturing, are you.
A. Not as familiar, correct.
Q. And you may be more familiar with their manufacturing than perhaps Mr. Tolnar?
A. I'm sorry. Can you repeat the question?
Q. Do you think you're more knowledge about Shoals' manufacturing than Mr. Tolnar?
A. I'm not sure.
Q. Okay. What about Mr. Bardos?
A. I'm not sure.
Q. All right. But is it fair to say that you are not as technically knowledgeable about the BLA as Mr. Solon?
A. Technically knowledgeable, he would be more technically knowledgeable.
Q. And Mr. Whitaker?
A. Correct, he would be more technically knowledgeable.
Q. Okay. But they're not here to testify, are they.
A. Correct.
Q. Now I'm hoping not -- well, let's see. So from this data sheet in this exhibit, this is from 2023, do you know what products Shoals sold in 2016 when the BLA first

sold?

A. Not off the top of my head.

Q. Do you know in 2017?

A. Kind of difficult to recall.

Q. Okay. What products did Shoals sell in 2018?

A. I don't recall when we brought the different mold drops to the market for the various configurations.

Q. And, in fact, you were gone from the second half of 2014 to 2017, right?

A. Yes. I left in August of 2014 and I came back December 1st, 2017.

Q. Okay. But still in 2018 you're not as sure what products, what BLA products Shoals actually sold.

A. I don't recall off the top of my head.

Q. And for 2019?

A. No.

Q. 2020?

A. I believe by that time we were doing a three input.

Q. In 2020 you were selling BLA's that had one, two, or three branch lines; is that what you're saying?

A. I believe so.

Q. 2021?

A. I don't recall exactly when the input leads kind of came on, but by the end of 2023 we had all these

configurations available.

Q. Okay. And it was your testimony that the one drop line was rarely used by Shoals; is that right?

A. Correct.

Q. What does that mean, "rarely used by Shoals"? Does that mean it didn't sell well?

A. It means that that particular configuration isn't really needed because of the project-specific engineering that's required. It's not technically viable to use that one.

Q. Is that based on your knowledge of sales histories or something else?

A. It is based upon my knowledge of what we're able to do with -- based upon the solar panel technology as well as the allowable passes that are required on the harness into the BLA.

Q. Okay. For example, though, let's pick a year, 2022. So in 2023 I think you may understand that we're not really looking at the numbers for 2023, but let's look at 2022.

Do you have any information as you sit here today on the amount of sales for each of these BLA products?

A. I don't believe so.

Q. Okay. So even though you say the one drop line was rarely used by Shoals, you can't back that up with more

specific information.

A. I believe that the configurations of the other mold drops were way more used or more readily used than the one.

Q. Okay. But it's not based on sales information.

A. That's just off recollection.

Q. Okay. It's more anecdotal?

A. Sure.

Q. Now earlier there was another exhibit, and I don't want to go into confidential, but please let me know if your answer needs to elicit confidential information, please stop me or stop yourself.

A. Okay.

Q. So does Shoals have part numbers for their BLAs?

A. Yes.

Q. Do you know what those part numbers are?

A. They change by type.

Q. Do you know what the part number is for the one drop BLA?

A. (Shaking head from side to side.)

Q. Or any of these BLAs?

A. (Shaking head from side to side.)

Q. Please testify so the record can --

A. No.

Q. Okay. But Shoals does use part numbers.

A. We use types for part numbers, yes.
Q. Can you give me an example?
A. An example would be after the second dot of the part number, there was two digits there. An example could be 18A as an example. For me, that means there are 18 total strings that are type A in that BLA. That's all it tells me.
Q. Can Shoals track how many of each type of BLA it sells per year?
A. I don't know if we can or can't.
Q. Is that a question for Mr. Bardos?
A. It may be, yes.
Q. Thank you.
MR. SHIN: I have no other questions.

REDIRECT EXAMINATION

BY MR. HARRIS:
Q. I just have a few follow-up questions, Your Honor.
Mr. Macias, you were shown RDX-5C.1. That was the drawing that Mr. Ou had up here that he drew. It won't be in your binder. It was the drawing that was on the ELMO on the screen.
Have you ever seen anything like that, like what he drew on the paper in the field?
A. No.

Q. Has Shoals ever sold anything like what he drew?
A. No.
Q. Was what he drew purely hypothetical?
A. Yes.
Q. And you said something in your exchange with Mr. Ou about that. You said that, if a customer asked Shoals to build what he drew, Shoals wouldn't sign up for the risk. Do you remember that?
A. Yes.
Q. What did you mean by that?
A. When we take a look at the projects and we evaluate the calculations for those wire harnesses, if it is technically not viable to build that wire harness and our customer asks us to build that wire harness for them, we will not.
Q. And why is that?
A. Because the liability of that ensues if something were to happen.
Q. Okay. You were also asked about Intertek Reports. Do you remember that?
A. Yes.
Q. What's the purpose of an Intertek Report?
A. The purpose of an Intertek Report is to obtain certifications per the standards that are required for photovoltaic installations as it pertains to safety.

Q. Okay. And how do you get certified by Intertek? What's the process? Do you know that?

A. I know that you have to send a bunch of samples and you have to go through pretty rigorous testing and you have to meet the minimum thresholds that are required on a per-test basis to qualify and obtain certification.

Q. Okay. If Shoals were to change its BLA product, would it have to go through recertification?

A. I'm sorry. If Shoals would have to what?

Q. If Shoals changed its product, would it have to go through a recertification process?

A. Yes.

Q. Okay. Mr. Shin was asking you about molding. Does Shoals have different tools for its molding?

A. Yes.

Q. Can you explain what a tool is?

A. Yeah. So a tool is a piece of aluminum, I believe, that is used to put into the injection molding machines, and there's usually a top and a bottom, and you place whatever you're molding, in this case the BLA, into the mold -- the tooling, sorry -- and then the mold machine injection molds the plastics, heats them up and does the undermold and overmold in this case.

Q. Okay. So is it the same, the same machines used to mold the different mold drops with different numbers of

drop lines?

A. Yes.

Q. Can the tooling change depending on the number of drop lines that you're molding?

A. Yes.

Q. Could you use the same tool to mold an eight drop line mold drop and a two drop line mold drop?

A. You could.

Q. And how would that happen?

A. You would plug the unused input wire leads and injection mold it. So only two would be molded.

Q. Now could you also change the tool from the eight drop and put in a different tool to mold the two drop line?

A. Yes.

Q. Okay. Why would you do one or the other, do you know?

A. Yeah. As I mentioned earlier, if I wanted to swap out the tool to do only a two as opposed to using the eight for the two, I would do so because I might save material and be a little bit more efficient with materials.

Q. Okay. When we're talking about a BLA product, are we talking about just one mold drop?

A. No.

Q. What are we talking about, when we say, hey, Shoals sells a BLA product, what does that product look

like? Does it have one mold drop, various mold drops? Can you explain it so that we understand what we're talking about when we say what is the mold -- what is the BLA product?

A. Yeah. So a BLA product is a prefabricated cut-to-length solution that has a number of mold drops and various input leads along the length of that BLA completed solution. So it is a complete solution when we're making them.

Q. So could you have a BLA product that has mold drops on the same product with different numbers of drop lines on the molds throughout the product?

A. Yes, you could.

Q. Okay. And is that a commonly sold product where you have different -- a different number of drop lines even though it's on different mold drops on a single product?

A. Yes.

Q. Okay.

MR. HARRIS: I have no further questions. Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

MR. OU: No questions, Your Honor.

MR. SHIN: No further questions, Your Honor.

JUDGE BHATTACHARYYA: Thank you. Mr. Macias, thank you for your time. You may step down.

THE WITNESS: Thank you.

MS. TRINH: Your Honor, Shoals calls Mr. Jeffrey Tolnar.

JUDGE BHATTACHARYYA: Shall we move the physical exhibits so that Mr. Tolnar doesn't have to deal with it?

MS. TRINH: Your Honor, may I approach?

JUDGE BHATTACHARYYA: Yes.

JEFFREY TOLNAR,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MS. TRINH:

Q. Please introduce yourself to the Court.

A. I'm sorry?

Q. Please introduce yourself to the Court.

A. Hello. I'm Jeff Tolnar, President of Shoals Technologies.

Q. When did you join Shoals?

A. I joined in April 2021.

Q. And how long have you been in your current position?

A. In my current position since December 2022.

Q. What are your current responsibilities?

A. I'm currently responsible for commercial growth, technology development, product development, engineering,

operations, basically everything except finance, legal, and HR.

Q. Do you hold any degrees?

A. I do. I've got an electrical engineering technology degree from Youngstown State and a master's in business administration from Baker University.

Q. And do you have any experience working as an engineer?

A. I do. My first jobs out of college were as an engineer, power engineer, transmission engineer. Then I went to engineering management. This was a part of Sprint, the telecommunications company.

And then later on in my career I became Director of Engineering and Operations, and then became Chief Technology Officer of a company called JPL Global, and then was head of Product and Engineering with a company called Elster Solutions.

Q. So approximately how many years did you work as an engineer?

A. Oh, in engineering disciplines, 10 to 15.

Q. And let's talk about the product at issue. Are you familiar with the Big Lead Assembly, BLA?

A. I am.

Q. What is the BLA?

A. Big Lead Assembly is a part of the electrical

balance systems that connects the harnesses that run underneath the solar panels to a disconnect box, which then goes to the inverter. And we'll go through a diagram later, but it essentially removes the need for a combiner box and home run cables.

Q. And what types of systems are BLAs used in?

A. Solar, utility-scale solar systems.

Q. What is a utility-scale solar system?

A. Utility-scale systems are those that are creating the energy in very large fields that are connected to the grid and provide energy directly to the grid as opposed to a residential field or a commercial field that's feeding that facility.

So a utility-scale field that Shoals sells into is -- are those large operations, I think 10 megawatts, up to a gigawatt, that are feeding the grid itself.

Q. And how big are those fields?

A. Oh, jeez, one I was just on recently is six miles long by three miles wide.

Q. Where was the BLA developed?

A. In Portland, Tennessee.

Q. Do you know what plant?

A. At that time I believe Plant 1 was the only facility we had.

Q. And where does Shoals sell the BLA?

A. We sell domestically 95 percent plus of our business is U.S.-based solar. We sell to engineering procurement construction companies here in the U.S. We started selling internationally a couple of years ago. It's still low single digits of market adoption internationally. So we're predominantly a U.S.-based business selling in the U.S.

Q. Have you always sold in the U.S.?

A. Have we always sold in the U.S? Yes. Yes.

Q. And have they always -- has BLA always been made in the U.S.?

A. Oh, yeah, it always has, even for the international projects, BLAs are made in the U.S. and always have been.

Q. And has the BLA been a successful product for Shoals?

A. I think so. We've got some charts later on that describe the growth projections, and when you consider starting a new technology in an established market, there's always challenges that you face with the existing customer base.

And we introduced that product in, I believe, in the 2019 time frame, and when we look at the company growth over that period and the growth that we've achieved over the last few years, the company really took off after the

introduction of the BLA. And we're close to -- our products are in close to 50 percent of the market today.

Q. But was the product immediately successful?

A. Oh, no. Any new product has challenges. When I talk about an established market, the EPCs had been deploying solar fields using home run wires into combiner boxes buried underground to protect the wires. So that method was in place for many, many years.

And then when Shoals introduced its Big Lead Assembly, that system itself is above ground, it doesn't require combiner boxes, doesn't require home run cables, so it was really transformative in the solar field.

So the EPCs had to first prove was it a quality product, did it pass the proper certifications, can they -- can we feel comfortable that it will do what Shoals claims it will do, is it economically viable.

So all of those constraints had to be overcome early on, and that's why, just like any new product, it takes time for it to be adopted.

Q. So how did you overcome that hesitance?

A. A lot of heavy lifting. We found first a couple of EPCs that were willing to try the product. They deployed and found that the technology itself did what we said it would do, which is it dramatically reduced the number of labor hours in the field, because instead of running home

run wires from solar panels all the way back to a combiner box and then the licensed electricians in the field have to strip the wire, crimp a lead on it, terminate into a combiner box hundreds of thousands of times.

In fact, in the calculation we said it's a hundred thousand physical connections in a 100-megawatt field. So if it's a 1-gigawatt field, that's a million connections that a person has to make. And what we did is we took labor from the field and moved it into the factory.

So our high-quality method of production allowed those connections to be made. Everything we do is plug-and-play, so everything we ship is connectorized. It allows general labor in the field as opposed to licensed electricians to do the work.

So the EPCs were not only able to reduce the number of licensed electricians, they were able to do the work with general labor. So fewer hours of labor, a lower labor rate could be used, and the efficiency that could be done. Because instead of doing the strip, crimp, terminate, they could now just snap in, move to the next, snap in. So it really was transformational in the way they did the work.

Q. And you mentioned earlier that Shoals is moving towards, I believe, 50 percent market share. How did you determine that?

A. Yeah. The way we're looking at it now is we use

data from the Solar Energy -- SEIA -- is solar energy group, and basically what they report on -- it's from the U.S. government -- of all the solar projects that are deployed in the U.S. when they come active, and we look at what project was shipped, what's the size of the product, was our product used on that field. Yes, okay, then it counts. And you add up the megawatts and gigawatts. And by the end of the year we had a good feel for what our market share is.

Q. Have you ever seen a photovoltaic installation using BLAs?

A. I have.

Q. Where have you seen it?

A. We have one at our facility, so Plant 1, and I've been to a customer's site.

Q. Can you walk us through a photovoltaic installation using BLAs?

A. Sure. Do we have a diagram? Okay.

Should I point? I'll point.

Okay. I have to be smarter than the pen.

There's four primary building blocks in a solar field. We've got the panels themselves. You can see the panels. They are structurally supported by the trackers. The electrical balance systems that electrically connects the panel then back to the inverter.

In a traditional method of deployment you would have home run wires out of the panels, out of the strings, that go to a combiner. The combiner then has DC feeders to an inverter.

Using a Big Lead Assembly, you've got the solar panels. They are connected to harnesses. The harnesses then run horizontally or in parallel with the tracker system. And then they snap into the Big Lead Assembly. And there will be some number of harnesses that will snap in based on the topology of the solar grid, the solar field.

So in this case you'll see we have four harnesses. This is a harness, that's a harness, and so on. And then you have your positive and negative Big Lead Assembly.

The feeder cable itself runs, then, in perpendicular to the tracker rows in an east/west deployment and in a north/south deployment. It runs in parallel with the tracker rows.

And then a large number -- this diagram doesn't show, but typically every two tracker rows you have a BLA mold drop. So you think of it this way. You have the BLA mold drop, another set of trackers, and a BLA mold drop, and then another set of trackers. And the number of harnesses are based on the number of strings that are deployed along the tracking system.

Q. Do photovoltaic components like the BLA have to meet certain standards?

A. They do. There's national electric code standards that they have to meet, and for safety and reliability they have to meet UL certifications.

Q. And how does -- how do they -- how do you get U.S. UL certifications?

A. We went through and the -- anybody that wants to sell a product in the U.S. has to go through what's called an NRTL, Nationally Recognized Test Laboratory, and there's a number of labs that will test to UL certifications. We use a company called Intertek to test our system.

And to get certification, you'll typically send a set of samples. You'll have a test plan that will be worked on with the engineers at Intertek. They will work with the engineers from our team to understand what needs to be accomplished, what UL certification we have to comply with, and then they will set up a full test plan.

Typically they will test to a maximum, because when -- in the solar -- in a solar field, there could be a high degree of variability. So there could be ten mold drops off of a BLA. The BLA could be hundreds of feet, eight hundred feet, two hundred feet. The spacing between the BLA mold drops can vary. The number of drops to the BLA mold drop can vary. There are a number of gauge size

differences in the feeder itself, gauge size differences in the drop wires.

So all that variability, what the test plan did was basically say what are the maximums, and then they tested to the maximums.

Q. And is that the process that Shoals followed for the BLA?

A. It is.

Q. And you mentioned the term "mold drops." What is that?

A. In the picture that we just had up -- sorry -- we can go to the real picture, one more --

These guys right -- this is the BLA mold, and then the drops are the drops that go to the harness itself.

Q. Does the BLA have different configurations?

A. It does. And virtually every solar field is different and very unique. The tracking system has variability. The spacing between trackers is different. The number of harnesses that connect into the BLA mold is different. The distance from the last tracker or first tracker, depending on how you look at it, back to the disconnect box is different. And then to the DC feeder, to the inverter, those are all variables and all different.

Q. I believe you mentioned earlier that the mold spacing may be different. Can you explain that?

A. Yeah. A lot of it has to do with geography and topology. The tracker systems, the ideal is you deploy in a flat, flat ground where there's no variability and rolling hills. In some cases it's not -- that's not the case. There may be rocky terrain in between.

So you would have a tracker row here, here, here, and then a space for the next set of tracker rows. So in that case you would have a bigger spacing between. So that's the high degree -- it has to do with the terrain that the solar field is deployed on.

Q. Did Shoals have to get a certification for each configuration of the BLA?

A. No. We tested to maximums, so we tested to the number of drops. I believe it's now up to eight drops out of the BLA. And then the size of the feeder itself, I mentioned a high degree of variability, so if we had to test every feeder gauge size, every feeder spacing, all the numbers of drops and the variabilities of the gauge sizes on the drops, it would have taken a very, very, extremely long time, cost an extreme amount of money.

And those are the times when the test house works with the company and you make sure you're compliant with the UL certification, but you're testing to what the maximums are, because, if you're less than maximum, you're still compliant.

Q. Okay. And once you get that certification, what can you do?

A. It allows us to sell in the market that we wish to sell in. So in the case of U.S., we certified to, I believe, UL 9703. It allows us to sell that product in the U.S.

Q. And is there any way you indicate to the market that you can sell it?

A. Typically, especially with a new product, EPCs, they are the engineer of record, so they have to sign off on a deployment. And I wasn't at Shoals when they sold the first BLAs, but you think through, and you're asking them to change the way they have done things for many years, and they have to stamp it and be the engineer of record.

And they would want to have -- make sure that that is certified, it's stamped as certified. So before you take that next step of an actual deployment, you've got to prove to them that the product has passed safety standards and that it's stamped with a tested to UL blah blah blah, whatever that is, and whatever that UL certification is.

And then we can tell the engineer of record it's been tested, certified, it is safe, and it does meet standards.

Q. So you would put that stamp on a product?

A. That's right.

Q. Okay. And have you stamped -- sorry.

Do all of your BLAs, are they all stamped?

A. I can't speak to the ones that were shipped years ago, but I know the ones shipped now are listed as ETL, which is the Engineering Test Lab specification, or there's an Intertek brand. Usually whatever the test house is that you get it tested, that's the stamp that you put on the product.

Q. And that was based on -- was that based on the certification that you just described?

A. Yeah, that's right.

Q. And --

A. The different test houses will say certified to UL standard in this case 9703.

JUDGE BHATTACHARYYA: Ms. Trinh, we decided earlier that we would conclude just a bit earlier today in order to discuss the objection. Is now a good place, a stopping place for you, or you would like to ask a few more questions?

MS. TRINH: I do have a few more questions, Your Honor, if that's okay.

JUDGE BHATTACHARYYA: Go ahead.

Q. Are you familiar with the manufacturing of the BLA?

A. I am.

Q. Does the BLA use the same mold for the BLAs with different drop lines?

A. There are different mold types based on the number of drops. So you'll have a mold in the molding -- it uses the same molding machine, but the mold itself is different based on the number of drops that are going to be served out of that BLA.

Q. Can you use the same mold to manufacture a BLA with different numbers of drop lines?

A. Can I use the same mold... Can you restate your question?

Q. Are you able to manufacture a two drop line BLA in the same mold as you would use for a three drop line BLA?

A. I don't know the answer to that off the top of my head.

Q. Okay. Are you familiar with the internals of the BLA, the internals of the drop lines and the feeder cable?

A. Somewhat.

Q. Is the feeder cable laid the same way in the BLA if there are different number of drop lines?

A. Yeah, the feeder is laid in the mold in -- I'm trying to figure out how to describe it. So you have a mold and you've got basically a cross-section, and the feeder line is laid in, and then you've got the lug that then has the drop lines, and that mechanism is then put into the --

into the injection molding tool, and then the mold itself drops and encapsulates and then it injects around the mechanism.

Q. And would that change with different numbers of drop lines?

A. The mold itself may have to change, yes.

Q. The feeder cable in the mold.

A. The feeder cable would be the same placement in the mold.

Q. What about the drop lines, if there was a different number of drop lines?

A. Same basic structure.

Q. And the compression lug?

A. Same basic structure.

Q. And would the BLAs with different numbers of drop lines function the same?

A. Yes, functions electrically the same.

MS. TRINH: This might be an okay time to stop.

JUDGE BHATTACHARYYA: All right.

Thank you, Mr. Tolnar. We will continue tomorrow.

THE WITNESS: Okay. Sounds good.

JUDGE BHATTACHARYYA: You may step down.

I believe we were going to discuss an objection with respect to Mr. Brooks' testimony. We're currently on

the public record.

MR. OU: Your Honor, I think we can stay on the public record for this.

So, Your Honor, as I mentioned earlier today, we received Shoals' demonstratives for Mr. Brooks' direct testimony last night. It was about 150 or 160 slides. We had a lengthy meet-and-confer last night, discussed our concerns.

We received an updated deck this morning. Many of those concerns still exist. And they would primarily go to, as Your Honor may recall, the Order No. 28 goes to whether or not Mr. Brooks can provide a representative products analysis that goes beyond his expert report and rule 11.6.3.

As one example, this is probably -- I'll give you two or three, which are probably the ones that would cover most of the issues.

For example, for Shoals' technical DI, he relies on the Intertek Report for Shoals' connection products, and that report is not discussed in any detail. There's no representative product analysis in his actual report, but it's about 15 slides. I don't have the latest deck, Your Honor. That's one of the issues we raised yesterday. That's issue number one.

Issue number two is for Voltage. Voltage

produced 18 product samples during the investigation, different configurations, different sizes of trunk cable, different number of inputs, and Mr. Brooks in his claim chart he charted one product.

And, of course, Your Honor we understand Your Honor's ruling on the representative product analysis for Voltage. We did not object to them admitting into evidence those physical samples, but we objected to him providing substantive opinions about many of those product samples where none of that analysis was actually disclosed in the report or in his claim charts.

And so, Your Honor, if his opinion is going to be I looked at all of them and they all look the same to me and then that's my opinion, that's fine, but, Your Honor, he has one slide per product, and at least the slides we got yesterday included an even new infringement theory on a claim construction he had never opined on.

And so those are, I would say, the biggest issues.

There is other documents that are, for example, on the materials considered but not actually discussed, and then now there's substantive slides that rely on those documents.

Again, Your Honor, we think that these all go beyond, you know, your ground rules as well as your MIL

order, Your Honor.

And I don't know what the update is, but, as I mentioned earlier, the discussion that we had and we conferred earlier and I also conferred with Mr. Shin, it seems as though some guidance from Your Honor would probably help.

Mr. Brooks' probably -- he is a key witness obviously and we need to be ready for his testimony and understand what is the proper scope.

JUDGE BHATTACHARYYA: Thank you.

MR. BARQUIST: Your Honor, of course there is no intention whatsoever to violate the Court's rulings and orders. However, I think that the Respondents' view of what Mr. Brooks' report and deposition and what the scope of that is -- and I think scope is one of the keywords in Your Honor's ruling and in the ground rule -- they have a very narrow, very crabbed view of what the scope is.

The reality, Your Honor, and I can take it one at a time, but the reality with regard to the Shoals BLA product is that in his deposition Mr. Brooks stated several times that he had an opinion about representativeness. He said, at page 278 of his deposition -- and we can get a copy for Your Honor -- it says, I would say that the products that I looked at were absolutely representative of the family of BLA products that are manufactured and are

compared in this claim chart for my opinion of the Shoals product practicing this patent.

Later on on the same page he said, the moldings and everything are exactly the same. There's no difference.

Question. Except for the number of drop lines?

That's the only difference.

The next page, page 278 he said, my opinion relative to the two and up on this product is that they all practice claim 1 in this particular situation. And there's zero doubt in my mind. I don't want to use the word obvious again, but this is -- it's visually obvious.

And then he was asked --

JUDGE BHATTACHARYYA: Mr. Barquist, with respect to those pages of the deposition, I thought that those related to the '739 patent and were questions asked by Hikam's counsel. That was -- because I believe those were -- the pages were cited in your opposition to the motion in limine and addressed in --

MR. BARQUIST: All of these questions, Your Honor, relate to the BLA. All of these questions and answers relate to the BLA.

JUDGE BHATTACHARYYA: Okay.

MR. BARQUIST: So, again, I mean, he clearly made the -- expressed the opinion that he found that the BLA on the basis of the samples that he received -- and he

described it. He described that he got a couple of actual samples, that he cut one open. He explained that he looked at the one that the Shoals team itself had cut open of a BLA mold drop. He testified that he was at the factory and saw several BLAs in the course of his visit to the factory in various stages of construction.

He testified that he talked to the Shoals engineers about the BLA. So he disclosed all of that during his deposition and in his report.

Your Honor, we think that, within the scope of that testimony, he is allowed to explain and elaborate to the Court when he takes the stand tomorrow about all of that that I've just mentioned.

JUDGE BHATTACHARYYA: Can you again identify which pages you're relying on in his deposition? Which pages are you relying upon?

MR. BARQUIST: Yes, the pages for the deposition regarding the BLA, in terms of describing what he looked at, I would cite pages 33, 35, 36, 37, and then regarding his representativeness opinions, beginning at page 275 through 279.

JUDGE BHATTACHARYYA: I thought I issued an order on this. Are you essentially asking me to reconsider the order in view of these deposition pages?

MR. BARQUIST: Well, Your Honor, your order was,

the undersigned finds that, pursuant to Ground Rule 11.6.3, Mr. Brooks shall be permitted to testify regarding representativeness to the extent such testimony is within the scope of his expert report and deposition.

JUDGE BHATTACHARYYA: Right, which is -- did not include --

MR. BARQUIST: I'm sorry?

JUDGE BHATTACHARYYA: Which I thought did not include a representative product analysis for the '153 patent. I believe that was the finding.

But if you're telling me that I was wrong and you want me to reconsider it in view of these deposition pages, I'll take that under advisement, but I just --

MR. BARQUIST: I hesitate to say that Your Honor was wrong. I don't think that, certainly in terms of the objection that's been made, that they fully appreciate what is and within the scope of Your Honor's order.

JUDGE BHATTACHARYYA: All right. So besides that deposition testimony, you're not pointing me to anything for support that provides a representative product analysis.

MR. BARQUIST: Excuse me? I'm sorry, Your Honor.

JUDGE BHATTACHARYYA: You haven't pointed me to anything in his report that provides a representative product analysis for the DI products, as I understand it.

MR. BARQUIST: Well, in his report -- I mean, his

report does say that he concluded that the BLA was -- that he concluded the BLA practiced the '153 patent. He did not use the word "representativeness" in his report, that is true.

JUDGE BHATTACHARYYA: Okay.

MR. BARQUIST: So, likewise, there is an objection about his ability to testify concerning the Voltage products and his representativeness finding.

And, again, Your Honor said that he could be permitted to testify on representativeness with respect to Voltage accused products, the general level of detail provided in his expert report and deposition.

Now with regard to his deposition, Your Honor, in his report -- sorry, I'm looking for the right page -- in his report, I'll have to paraphrase it, Mr. Brooks testified -- there we go, thank you.

He testified in his report at paragraphs 59 and 60, Mr. Brooks said, regarding the Voltage Trunk Bus products, I've examined all that were provided to me. That's the 18 or 20 or so that Mr. Ou just referenced. I have examined all that were provided to me and find no differences among them as far as the structure and the structural relationships at issue in the claims of the '254 and '153 patents.

And in paragraph 60 he said exactly the same

thing with regard to the alternate design Trunk Bus products that were provided to him.

Now, interestingly, Your Honor, during the deposition, when he was asked about that opinion, Mr. Ou specifically told him that he did not want to hear an explanation about that. Mr. Ou said, and I'm not looking -- this is at page 344, Your Honor --

Question. And I'm not looking for an explanation. I just want to confirm that in the body of your report you have not provided an explanation as to any type of representative product analysis you did in forming the opinion in paragraph 59.

And, again, with regard to paragraph 60, he said, an explanation, I don't want an explanation, but any explanation of how you arrived at 59, that's not disclosed in your report; is that right?

So he specifically told Mr. Brooks I don't want to hear an explanation. So Mr. Brooks didn't elaborate, because he wasn't asked to elaborate. He was told not to elaborate.

But that's not on us, Your Honor. That's a decision that Voltage made at the deposition to limit the scope of what they were asking for.

So I think it's clear that Mr. Brooks should be able to explain his opinions and refer to the products that

he examined and elaborate within the scope of his opinion as expressed in the report and deposition.

Now there's some specific things that were mentioned by Mr. Ou. The Intertek Report, for example. First of all, the Intertek Report is cited in his report, but perhaps even more importantly Mr. Brooks testified during his deposition on several occasions, at several points during the deposition, that he is aware of the Intertek Reports, he understands the purpose of them, and relied on them in part for his opinion, his analysis.

Likewise, he said that he cited and referred to the data sheet. We saw one of the data sheets this afternoon. They were objecting to his demonstrative that references the data sheet.

I can give you cites, Your Honor, for the references on the Intertek Report and the data sheets, if you're interested.

But I think all of this is within the scope of what Mr. Brooks disclosed, what he was asked about at his deposition. And all we're proposing with these demonstratives for his testimony tomorrow is to have him explain within the scope of what his opinion as stated was and give some details to Your Honor so that you can understand what it is.

JUDGE BHATTACHARYYA: Thank you.

MR. BARQUIST: Lastly, Your Honor, again, as Mr. Ou indicated, we have a range of -- we will have in the courtroom -- I think they are here already -- but we'll have them out tomorrow the actual physical samples, the 18 or 20 odd samples that Mr. Brooks actually sliced in half like the BLA mold drop you saw this afternoon.

And what we've done, because they are physical exhibits, we have taken a picture of them. And in our demonstratives we have a picture of a physical exhibit. And they are objecting to those, because on the picture in our demonstrative we have pointed out where the feeder cable is, where the drop line is, where the aperture is.

But, again, all we're doing, Your Honor, is elaborating on what's in his report with regard to the exemplar. And we're saying the same things can be found in these 18 or so similar models that he examined, again, which they are aware of. They have been aware of that for some time.

JUDGE BHATTACHARYYA: Thank you. Your position?

MR. SHIN: Your Honor, first of all, there's no need to rehash Your Honor's ruling in Order 28. Your Honor did the review. There's no representative analysis that Mr. Brooks provided for, in particular, for Shoals' DI products.

Now there was some mention of representativeness

for Voltage's products. And you did allow that. So that's, I think, what Mr. Barquist read was pertaining more to that side.

But for Mr. Brooks testifying on representativeness, that should all be out. And the only reason for the Intertek Report for the BLA, I mean, there is two Intertek Reports. The Intertek Report for the BLA, which is really just their attempt to try to shore up their representative case, which, by Order 28, can't come through Brooks. They had a chance to do it this morning with Mr. Macias, and they just chose not to do so.

There's a second Intertek Report, and that deals with Voltage's products. And I don't know as much about that. I don't think that was considered as much in your ruling. Perhaps -- but that's a separate issue.

But the Intertek Report, whenever I hear Intertek Report and I review Your Honor's ruling in Order 28, that really only goes to representativeness.

And that's because Mr. Brooks, if you recall from his expert report, it was very short. It was like 30 pages. It was very cursory. He had a lot of claim charts. Most of those claim charts are no longer at issue because they related to the '739 and '254.

But even his claim charts were very bare bones, and that's why Staff put them in Staff's demonstratives this

morning to show you that he had sliced-through pictures but his annotations were very ambiguous or misleading.

And the fact is he never did provide -- he admitted he didn't provide an opinion based on Staff's and Respondents' proposed construction, which is more in line with Your Honor's actual constructions.

So all of his annotations only really relate to Shoals' proposed construction that has since been rejected that the aperture means all or part of pathway.

So Mr. Brooks is really trying to come up with a new infringement opinion altogether, and he really -- he never provided an opinion earlier and he can't be allowed to provide that opinion now.

JUDGE BHATTACHARYYA: Pages 275 through 279 that Mr. Barquist referred to, can you -- are you saying that's --

MR. SHIN: Your Honor, I haven't reviewed all of that. Now I asked Mr. Brooks, you know, and really the fact is that, if he doesn't provide a representative analysis in his expert report, if he doesn't emphasize it, then it's not going to be emphasized during the deposition.

However, I did emphasize it to the extent that, hey, it's not in your expert report. You haven't put anything in your claim charts that shows representativeness in an explicit manner. And so do you understand that you

haven't provided it, and he did agree to that.

So if there was some context before leading up to that, he may have thought he did a lot, but in actuality he couldn't testify that he did other than just I think even Mr. Barquist pointed a visual inspection, which is not a representativeness analysis, Your Honor.

So, you know, they are trying to open doors so they can get more in. And Staff and Respondents are clear that we want Order 28 to be enforced, and the Intertek Report should be excluded from Mr. Brooks. He didn't testify. It wasn't in his expert report. It wasn't in his claim charts. He cited to it, but if he is not going to emphasize it, we're not going to emphasize it during the deposition, and it's too late to try to have him introduce it now and for us to try to cross him on that.

JUDGE BHATTACHARYYA: All right. Thank you.

MR. SHIN: Thank you, Your Honor. One more thing, Your Honor. So you haven't -- we haven't shown you the confidential slides that Shoals is proposing to have Mr. Brooks testify on. And we're hoping that, through the meet-and-confer process, they will sort of take a step back and remove many of the annotations that weren't in his expert report and weren't in his claim charts.

So if they want to try to talk him through where certain apertures are, you know, we'll get to that argument

during his testimony, but for the demonstratives the annotations are very misleading, very prejudicial to Respondents and Staff, because they are new, and they raise all sorts of potential issues, especially if they are introduced into evidence.

Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you. Anything further, Respondents, especially with respect to pages 275 through 279 of the deposition transcript?

MR. OU: Your Honor, if I may briefly?

JUDGE BHATTACHARYYA: Yes.

MR. OU: Thank you, Your Honor. A few just quick points.

With respect to the testimony at page 275 through 279, Your Honor, Mr. Shin is right. He asked Mr. Brooks, basically, to confirm that he had not actually done a representative product analysis because in his report there was very little said about -- there is nothing said in his report about representative analysis. I think in Your Honor's Order 28 you point out the statement that he makes for Voltage's products, and I agree with Mr. Shin, it's different. And that's why Your Honor's Order No. 28 was slightly different.

For Voltage's products, we agree he can do what's within the scope of Order No. 28. Our view based on what

was disclosed yesterday was they wanted to go well beyond that. That's Voltage.

On the technical domestic industry, though, Your Honor, I think a really big difference, which maybe was not as clear from the argument from Mr. Barquist, was, for Voltage, we produced 18 different product samples. For Shoals, the one that Mr. Macias testified, that was a single one product sample that we received in the investigation.

And as far as I understand, that's the only one that Mr. Brooks actually cut open and analyzed, let's just say, in the same way that he allegedly did for the Voltage products, right.

But here now they want to say, well, we analyzed that one, and then there's this vague unknown universe of things that he also did. He went to the factory. He talked to some people.

We asked him about those things in his deposition, and he couldn't recall specifically who did you talk to, what did they tell you. None of that.

And so, Your Honor, now we have an Intertek Report that's just identified in the materials considered. We can tell, Your Honor, if we go on the confidential record, we can look at the charts, but it's very clear to us that what is happening is he is attempting to rely on the Intertek Report to fill in those gaps that are just nowhere

disclosed in either his expert report -- and I don't think the spirit behind the ground rule of, you know, and what you talk about in your deposition testimony is to invite, well, I'm not going to tell you anything and it's up to you, if you don't ask me, well, then, it's fair game. I don't think that that's how the disclosure rules are supposed to work.

And it seems very clear as to what Shoals is trying to do. And so, Your Honor, we ask -- we agree with Mr. Shin. It's a motion for reconsideration that should be denied, and then if there's anything further guidance from Your Honor so that we can move forward with his testimony and narrow the number of disputes.

I don't have anything further unless Your Honor has a question.

MR. CHAIKOVSKY: I have one more comment. In Order 28 you did address this, Your Honor. And you commented, the level of detail which Shoals points to is -- he can comment on the general level of detail. That general level of detail in Order 28 with respect to Voltage's products stated that what he gave was find no differences among them. You put it in bold, italics. Put it in there twice.

That's what he is limited to saying, not providing and exposing details that were never provided before and should have been provided during discovery. If

he wants to say he finds no differences among them, great.

JUDGE BHATTACHARYYA: Okay. Thank you.

MR. OU: Thank you, Your Honor.

JUDGE BHATTACHARYYA: Mr. Barquist?

MR. BARQUIST: Briefly, Your Honor. First of all, I really don't appreciate the suggestion that we've been misleading the Court in any respect. That's certainly not our intention.

Just to be clear, and it sounds like Your Honor is going to do a little homework tonight. If I could cite you to where Mr. Brooks discusses the Intertek Report in his deposition. That's at pages 283 through 285, 287, and also at pages 335 to 336.

So he discusses the Intertek Report, not only -- including but not only with respect to the '739 patent, and I think it's clear from that testimony that it's part of what he relied on in reaching his conclusions.

Thank you, Your Honor.

JUDGE BHATTACHARYYA: Okay. Thank you.

I do want to look over the deposition testimony, but, in general, the expert is not supposed to go significantly beyond the expert report. If he had -- for infringement, he had a claim chart for one product and then said all the products seem the same, then he is not supposed to put in multiple claim charts for multiple products.

I don't know if that provides some guidance, but I would view that as going beyond the scope of his expert report. The report only has one claim chart.

With respect to DI, I'll look at it again, but I don't recall anything linking the Intertek Report to any representativeness analysis. I don't recall any representativeness analysis. But I will look at the deposition transcript.

To the extent there is something there linking Intertek to representativeness, I'll look at it, but on the whole I'm not getting the impression that that's there, but I do want to look at the deposition again.

So it would be helpful if the parties can give me hard copies of the expert report and deposition transcript, and if you can send me the demonstratives by email as well that are at issue, that would also be helpful. Is that possible?

MR. BARQUIST: We will do that, Your Honor.

MR. OU: Yes, Your Honor, we can do that. I have a hard copy of the transcript here and the expert report, if you want to take it --

JUDGE BHATTACHARYYA: Yes. Do you have two copies, by any chance?

MR. BARQUIST: I do, Your Honor. I have another one.

JUDGE BHATTACHARYYA: I think that is it for today. I'll see you -- I'll see everybody tomorrow morning.

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(Whereupon, the proceedings concluded at 5:25 p.m.)

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C E R T I F I C A T E

TITLE: IN THE MATTER OF CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1365

HEARING DATE: March 18, 2024

LOCATION: Washington, D.C.

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: March 18, 2024

Signed:

ss// LaShonne Robayo

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// Barbara Meyle

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed: March 18, 2024

ss// Linda Penkade

UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

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OPEN SESSIONS

Pages: 255 through 537 (with excerpts)

Place: Washington, D.C.

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

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International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Tuesday, March 19, 2024

Volume II

The parties met pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

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CONTINUED ON FOLLOWING PAGE

A P P E A R A N C E S (continued):

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*** Index appears at end of transcript ***

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: Good morning, everyone. Please be seated.

I want to start with a couple of housekeeping matters and follow up on the discussion yesterday.

I understand the parties may have reached an agreement regarding the objection to the demonstratives; is that correct?

MR. OU: Yes, Your Honor, subject to your approval, when you're ready, we can indulge you and tell you what we came up with, but it is subject to -- if it's acceptable to you.

JUDGE BHATTACHARYYA: Okay. What is the agreement?

MR. OU: Sure, Your Honor. So the parties met and conferred and have proposed, number one, just with respect to Mr. Brooks' demonstratives, the objections will be withdrawn that were previously submitted. I believe Shoals' motion for reconsideration of Order No. 28, that's no longer on the table.

And then with respect to, I think the focus of the dispute is the Intertek Report of Shoals and whether or not Mr. Brooks can testify about it.

What the parties agreed, Staff and Respondents

have proposed, and Complainant has agreed subject to Your Honor's approval, that the testimony that Mr. Barquist cited yesterday during the hearing, of which Mr. Brooks talked about the Intertek Report generally but not the actual exhibit, we would propose submitting that into the evidentiary record, Your Honor.

So the record has the extent of whatever Mr. Brooks testified to in his deposition, and then he otherwise will not testify about the report or be a sponsoring witness for the report in his testimony.

JUDGE BHATTACHARYYA: Mr. Barquist, is that agreement acceptable to you?

MR. BARQUIST: Well, that's part of the agreement, Your Honor. The other part of the agreement is that the testimony that I cited from Mr. Brooks' deposition, including some additional context pages that Mr. Shin, in particular, wanted to add, will be prepared -- we'll put this together later, Your Honor -- will be prepared and submitted as an exhibit and introduced as part of the record.

So exactly what Mr. Brooks said and didn't say about representativeness and what he looked at and about the Intertek Report will be in evidence.

JUDGE BHATTACHARYYA: So that's pages 275 to 279?

MR. BARQUIST: Well, I think it's a few pages in

the beginning, 33 through 37 approximately, and then Mr. Shin wanted to start a little bit earlier, about 264, I think, up through about 288, and then a couple pages, 335 to 336. That's the general area we're talking about.

And so as part of the agreement we would not seek to offer the Shoals Intertek Report through Mr. Brooks. He won't give any further testimony about the Shoals Intertek Report.

Again, so there's no confusion, Your Honor, there's no objection to him talking about the Voltage Intertek Report. So he will talk about that report but not the Shoals report.

JUDGE BHATTACHARYYA: All right. So essentially you're going to be offering certain deposition designations for Mr. Brooks.

MR. BARQUIST: Correct, by agreement.

JUDGE BHATTACHARYYA: Mr. Shin, is that acceptable to you?

MR. SHIN: Yes, Your Honor. This was Staff's proposal. We had several meet-and-confers on this issue. Your Honor may have seen the slides. There were some annotations on the slides that we also objected to. But through the meet-and-confer process Shoals has removed those annotations. So those were already sort of handled. What was remaining was the Intertek Report for Shoals' product.

Even though it is not ideal, it is expert deposition testimony. It does seem to be a compromise on the issue and help alleviate and make the testimony of Mr. Brooks more efficient so there aren't continuing objections to things that he says.

JUDGE BHATTACHARYYA: All right.

MR. BARQUIST: Just to clarify, Your Honor, the slide deck we'll use today will have the Intertek Report in it, but before we submit it we'll pull those pages out.

JUDGE BHATTACHARYYA: Understood.

MR. OU: Your Honor, just to clarify, with respect to the Voltage Intertek Report, we don't object to Mr. Brooks talking about it, obviously subject to the bounds of your MIL, Order No. 28, Your Honor.

JUDGE BHATTACHARYYA: All right. Thank you. I will note that I did review the transcript pages at 275-279 yesterday, and there was certain limited testimony about BLA being representative that I thought could support at least a statement of representativeness. To the extent that conflicts with Order No. 28, that's my reconsidered ruling.

MR. BARQUIST: Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you. The proposal is acceptable.

The other issue I wanted to raise was the admission of exhibits. I received a list by email. In

terms of procedure, I'd appreciate if the parties could provide a hard copy here at the hearing. I'll just quickly confirm on the record that there are no objections and admit the whole list of exhibits into evidence.

If the parties are prepared to do that now, we can do that now or later.

MR. COYLE: Your Honor, Jordan Coyle for Voltage. I don't think we have a hard copy right now, but we can print one out and admit that hard copy at the break, if that's okay.

JUDGE BHATTACHARYYA: That sounds fine.

MR. COYLE: Thank you.

JUDGE BHATTACHARYYA: Anything else before we proceed with Mr. Tolnar?

MR. OU: No, Your Honor.

MR. HARRIS: Nothing from Voltage, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

JEFFREY TOLNAR,

having been previously duly sworn or affirmed on his oath, was thereafter examined and testified further as follows:

MS. TRINH: Good morning, Your Honor. Christina Trinh from Maschoff Brennan for Shoals.

DIRECT EXAMINATION (resumed)

BY MS. TRINH:

Q. Welcome back, Mr. Tolnar.

Mr. Tolnar, do you understand that as a fact witness you are sequestered?

A. Yes.

Q. What did you do yesterday after you provided your testimony?

A. Took a very long walk to the law offices in a cold night. We went through some of the really interesting, to the minute, how long people talked, which I thought was interesting, and then we talked about logistics for today, and then I was kicked out of the room. So I went and had dinner with a friend.

Q. I'd like to show you what's been marked as Exhibit JX-0103. And you also have it in the binder in front of you.

What is this document?

A. That's the 2022 Shoals Annual Report.

Q. Please turn to page 9 and look at the first full paragraph, the fourth sentence, around the middle of the paragraph.

It says, "The BLA is our core combine-as-you-go product."

What is the combine-as-you-go?

A. Combine-as-you-go is what we call our electrical balance systems offering. So it's our system solution that includes the Big Lead Assembly at the center. It's the diagram that I talked about yesterday. The harnesses, the Big Lead Assembly, load-break disconnects. So it's the part that connects the solar panel to the inverter and all parts in between.

Q. Why is the BLA Shoals' core combine-as-you-go product?

A. Well, really it's where the value is created for the customers. We talked a bit yesterday, and we'll talk more today, about when a BLA is used there's no longer need for the combiner box and you don't need home run cables.

So the -- removing the home run cables and the combiner box saves some material costs, but most substantially it saves labor costs. So the BLA allows the connections to be made rather than stripping, crimping, terminating every wire. It's a plug-and-play connection in the solar field itself.

So the BLA enables the value.

Q. And can you turn to Exhibit JX-0113?

A. Okay.

Q. What is this document?

A. That is the first quarter 2023 Inverter Presentation that I gave about almost a year ago.

Q. And if you turn to page 18 of that document, what is the importance of eliminating the combiner box?

A. I think this is a powerful slide for our industry. When you look at the way solar deployments had been done for quite a long time, especially utility-scale solar, this is the diagram I talked about yesterday. You have the panels and the inverter that are the bookends. In between that are an aggregation of panels that becomes a string. And every string, then, has to be -- have a harness or a wire that takes it back to a combiner box. The combiner box then combines a lot of small gauge size wires into a few large gauge size wires. It then goes to the inverter.

The important point of this slide is for a 100-megawatt field you have about 100,000 physical connections. And before Shoals introduced the BLA, that had to be done with licensed electricians in gloved hands and they were working in the field.

So any person, no matter how skilled, when you're doing that much physical work, the first crimp is not going to be exactly the same as the last. And there's just so much work that's available to be done.

And then this is for a 100-megawatt field. There are fields now that are 500 to -- megawatts to a gigawatt. So that's a million connections that have to be made by

people.

So that's the importance of this slide. And I believe on the subsequent slide we talk about what changed.

Q. Can you turn to page 21?

A. Okay.

Q. And this document lists the six advantages of the combine-as-you-go.

Do these advantages relate to the BLA?

A. They do. The BLA specifically and the combine-as-you-go system generally. I'll go through each one of them. Focus on the ones that I think are really relevant, most relevant.

So can be installed by anyone. I mentioned on the prior slide that the EPCs had to have licensed electricians that would do the work in the field and provide the high-quality connections, but the mass number of connections that had to be applied made it prohibitive, because there's a scarcity of licensed electricians in the market today, and there were years ago too.

So what Shoals did is we created a product that can be installed by anyone. The people in this courtroom could theoretically deploy utility-scale solar field because there are snap-on connectors. The wires are hung on a wire management system.

So even with gloved hands the work can be done

very quickly and by general labor as opposed to skilled licensed electricians. So it not only reduced the raw number of licensed electricians needed, it allowed a lower cost labor force to be used.

So the first value proposition of the BLA is that it can be installed by anybody, which means it's lower-cost labor, that's more prevalent, more available.

The second one is it enables aboveground installation. The molding that we talked about yesterday is the resin allows for a bond between the mold and the insulation jacket. So that bond prohibits water and air from getting into the electrical joint.

The importance of that is that, if water gets into that joint, it can cause a fault to ground, and a fault to ground is called leakage current in the UL test. That fault-to-ground is either going to damage the equipment or hurt somebody.

And those are paramount in any solution that is above ground. That's why cables had always been buried underground, to protect the cables from people and people from the cables.

Our system allowed it to be placed aboveground because of the molding technology that didn't allow water ingress, but then also air ingress, because air on an electrical joint, it causes corrosion or it allows corrosion

to happen over time when air hits a metal object.

So air molecules also are not able to get in through that joint that's created. So it allows us to install aboveground.

So that eliminates civil work, you're not digging up the land, the Bureau of Land Management now doesn't have to worry about trenches in the ground. So now it's an aboveground system. So there's value there in more than just the economics. It's also in preserving the land that the solar fields are deployed on.

The third one is reducing wire runs dramatically. We touched on that one already. When you look at 18,000 home run wires in a 100-megawatt field, that then is dramatically reduced because you're aggregating those into a Big Lead Assembly, so you have fewer cables that are run and the commodity of those cables reduces.

Eliminates combiner boxes. We talked a bit about that. The combination of the small gauge size to the large gauge size, that happens in the BLA mold drops that are cascading throughout the solar field as opposed to combiner boxes that are placed in a more central location. So that helps with the economics. It helps with also long-term maintenance.

Most of the maintenance issues, and I'm skipping ahead to number 6. Most of the maintenance issues in a

solar field, many of them in EBOS, happen in the combiner box. The fuses tend to blow. And a lot of that is due to what's called thermal runaway, where the heat from the first fuse cascades and causes the other fusees to heat up, and there are quite a few reports of blown fuses.

Well, that, in and of itself, is expected. That's what the fuse is supposed to do. But then you have to dispatch a technician. You have to have a person go out. You have to prepare the fuse. You have to do a lock-out, tag-out on that section. So it's a lot of work that's required.

And in the combine-as-you-go system the fuse is embedded in the cable that then goes into the BLA. So the loss -- the combiner box being removed helps not just with the economics of the combiner box but also with long-term maintenance.

And then the safety and reliability, I talked a bit about where the cables, as we're producing them, are wet hipot tested. So they are tested in a -- they are actually submersed in a liquid surfactant that ensures that the leakage current dramatically -- is dramatically better than what UL requires.

So we test greatly in excess of UL requirements. So we believe that, because of that, we have greater safety and reliability, and the physical connections themselves are

done in the factory with factory-grade reliability as opposed to in the field by hand.

As I said, no matter how skilled the person is, when you've done thousands of connections a day, there's going to be variability.

Q. And can you turn to page 26? Can you tell me about this slide?

A. Yes. A few things I'll point out.

There's the horizontal rows and then the vertical columns. What this shows in the columns are from time period to time period of the adoption of our Big Lead Assembly.

The last column on the right was, at that point in time, at the end of third quarter, the end of first quarter 2023 --

MS. TRINH: May I approach Your Honor?

A. I've got water. Thank you.

Prior quarter and then prior year. So this shows a sequence or flow from left to right of adoption of the product.

And then horizontally in the rows the prospects are those customers where we've quoted or they're interested in our combine-as-you-go system, Big Lead Assembly, and then the goal then as a company is to flow from bottom to top and left to right.

The "in transition" are those customers that have purchased or intend to purchase a Big Lead Assembly, so they are in transition from a home run scenario. And then "converted" are those customers that predominantly buy BLA.

Q. Thank you. In your experience, once a customer has been converted to BLA, do they go back to a non-BLA system?

A. It's rare. And I'll explain why it's rare.

Once the customers really understand the value proposition of BLA, they stick with it. There are some smaller fields where, if you don't have consistency of tracker rows and commonality of the way the rows and the strings are laid out, then you may -- home run solutions may be a good fit there.

So our goal, as Shoals, is to provide the best possible solution for the customer. And if that -- if the best solution in that scenario was a home run solution, then that's what we will quote.

We still provide home run wires with combiner boxes. We still have that as a solution. So that's one option.

The other option is there are -- when we lose to a competitor, and that's happened more recently. One of the reasons why we're here.

Q. And can you turn to page 35 and tell me about

this slide?

A. There's a few things to call out here. When we look at the sales cycle, we first look at the pipeline, which is the raw number of opportunities. We then generate quotes. So we're looking at quoting activity in the market to give us an idea of growth potential. Quotes then convert into what we call an awarded order. The awarded order is when a customer says, okay, Shoals, congratulations, you've won the project, and then our design engineers work closely with their design engineers to finalize the design until the point where the design is approved by both sides, we both check it off, we do a final purchase order. That purchase order then becomes backlog. And then backlog then is converted into a final product and shipped and revenued.

So what's shown on this chart are the quoting volumes, which are -- which at that point are growing 56 percent year over year, and our backlog on awarded orders was up 75 percent year over year. And the market was growing at, I can't remember the exact number, but I believe the market was growing at about 18 to 20 percent.

So we were two to three times market growth rate.

Q. And, Mr. Tolnar, do you recall yesterday we talked about some configurations of the BLA?

A. Mm-hmm.

Q. Have you ever seen a one-drop BLA?

A. I personally have not. After deposition, I became very curious about the one-drop. So I did some research and found that there was maybe one quote that included a one drop on a north/south configuration a few years back. It is something that is very, very rare if we do it.

And the main reason is, essentially a one drop is lowering gauge size from an S, 6 or 8 gauge wire into a multiple hundred KCMIL cable, and that's just not economical. So we're always looking for a one-to-many when we use the BLA.

So the designs typically don't have that because it doesn't get the benefit for the customer.

JUDGE BHATTACHARYYA: Is there an objection?

MR. CHAIKOVSKY: Several objections there, Your Honor.

This witness testified as a 30(b)(6) witness, was designated on corporate strategy separately, wasn't designated on design of products that are domestic industry or others, Macias, Whitaker, et cetera.

When asked about the one-drop BLA, he believed the one-drop BLA was covered by the patent, and that's all he knew about a one-drop BLA. That's all he provided. I can find that testimony from his deposition. There was no other testimony.

And, again, he is not designated on this topic. Those are other individuals, I can go through, which were the features and capability of any DI product, timelines, facts, those are all Macias, Whitaker, Bardos, not Mr. Tolnar.

MS. TRINH: Your Honor, this is within Mr. Tolnar's personal knowledge. He is not limited to his deposition testimony in this seating. He has explained that he is familiar with the configurations. I think he's qualified to testify about this.

JUDGE BHATTACHARYYA: Mr. Shin?

MR. SHIN: Your Honor, I have no objection. I mean, I think we can address this issue on cross.

JUDGE BHATTACHARYYA: In order to save time, I will permit a motion to strike on this issue, but let's move on at this time.

MS. TRINH: Your Honor, the next set of questions may elicit Shoals' confidential information, if we could move to the confidential order.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MS. TRINH:

Q. Please turn to Exhibit JX-107.

A. Okay.

Q. What is this document?

A. It looks like our S-1 from July 2021.

Q. And please turn to page 13.

A. Okay.

Q. What does Shoals say about its margin under the first bullet point?

A. I think it goes back to the discussion we just had. We are in higher margin selling combine-as-you-go than we do selling our other products.

I mentioned a few minutes ago that the BLA is really where the value is created. And the BLA is our highest margin product that we offer. It allows us to compensate for lower margins on the harnesses and the load-break disconnects.

Q. And why is the BLA the highest margin product?

A. It's where the value is created. And we talked about that a bit. When I say "value," it's because of the -- because of the BLA you don't need the home run wires, and the dramatic amount of labor hours required to do the

home runs also goes away.

Q. Can you please turn to Exhibit JX-0112?

A. Okay.

Q. And what is this document?

A. That is our 10-Q from March 2023.

Q. And if you turn to page 27, what does Shoals say about revenue, looking at the first sentence after the heading for "Revenue"?

A. The point that I would call out is the increase in revenue, 55 percent, in a market that was substantially lower than that. And that the increased demand for solar EBOS generally, so that's the growth in the market itself, and our combine-as-you-go system specifically, that's what drove that growth, is the combine-as-you-go system solution that features the BLA.

And then it says to a lesser extent increased pricing. There was a pricing increase during that period of time, but it in no way constitutes a 55 percent gain. So the pricing increase was de minimis compared to the market growth gains.

Q. And has Shoals expanded since the BLA was introduced?

A. We have. A few times actually. I think if you go to the next slide... maybe not. Okay.

We started off in Plant 1 in Portland, Tennessee,

about 25 miles north of Nashville. We then -- we added equipment. We added production lines in Plant 1 in 2021 after I had started. And then in late 2022 we signed a lease for what we call Plant 4, 220,000-square-foot facility, and about five miles away from Plant 1 in Tennessee.

Plant 4 is now fully operational and producing equipment, including the BLA. So the BLA is made in Plant 1 and Plant 4.

And then we just announced that we signed a lease for a very large facility, also in Tennessee, that will allow us to continue to grow in the marketplace. So we're fully invested in U.S. manufacturing. Our sales are domestic. And our goal is to continue to hire people that are paying taxes.

Q. And one final question. Why did Shoals bring this investigation?

A. Yeah, I'm going to take you on a little journey before I get to that answer.

Shoals has been known as an innovative company in the marketplace. Because of that innovation, we invest in research and development and R&D and engineering. And then that investment in Tennessee-based resources, then how you do you protect, then, your position in innovation, it's by creating patents.

So Shoals then patents what we believe are unique ideas, unique solutions in the marketplace. And then when we have those patents in place, we could choose to not do anything with them and just keep them in a back pocket.

In this case we felt that Voltage was infringing upon our intellectual property with imported products into a market that we created or, at the very least, redefined.

And that's the purpose of having a patent, is to defend it when you see what we believe is an infringement. So that's why we brought the case at this time last year, and that's why we're here.

MS. TRINH: Thank you, Mr. Tolnar.

I pass the witness.

CROSS-EXAMINATION

BY MR. CHAIKOVSKY:

Q. Good morning, Mr. Tolnar.

A. Good morning.

Q. You're the current president of Shoals, correct?

A. Yes.

Q. And you just left off with the reasons for bringing this investigation, correct?

A. (Nodding head up and down.)

Q. When the complaint was filed you were interim CEO of Shoals, correct?

A. Yes.

Q. And present -- sorry. And this investigation was filed in May 2023, correct?
A. Yes.
Q. And you authorized this lawsuit against my client Voltage to be filed, true?
A. True.
Q. You were part of the decision to file this investigation, true?
A. True.
Q. And the only IP counsel involved in the decision to file this investigation was Maschoff Brennan, correct?
A. Correct.
Q. You were here for my opening statement, yes?
A. I was not.
Q. Okay. When this lawsuit was filed the complaint included two patents, correct?
A. Correct.
Q. And those two patents --
A. Actually three, I believe.
Q. It was initially investigated, there were two, yes?
A. (Nodding head up and down.)
Q. Those two patents, when it was initially filed, were the '739 and '254 patents, correct?
A. Correct.

Q. Those patents are no longer in the case, correct?
A. Correct.
Q. And you understand that the '739 patent is no longer in the case because Shoals could not meet the technical domestic industry prong requirement, correct?
A. I can't speak to why it's not, but it's not.
Q. And Shoals stipulated to dropping the '254 patent from the case, correct?
A. Yes, so we could focus on the '153.
Q. But you stipulated to dropping the '254, correct?
A. Yes.
Q. Do you understand that in the Markman hearing Your Honor ruled against Shoals with respect to the definition of parallel on the words of the '254 patent, correct?
A. Yes.
Q. And it was after that that Shoals stipulated to dropping the '254 patent, correct?
A. Correct.
Q. And it was after Shoals filed its initial investigation with two patents it eventually added the '153 patent to the case, correct?
A. Correct.
Q. And, again, the '153 patent was prosecuted by the law firm Maschoff Brennan, correct?

A. Yes.
Q. That's the only patent remaining in this investigation, true?
A. That's true.
Q. So you brought a three-patent case, but in the end only one patent remains in this investigation, true?
A. That's true.
Q. And Maschoff Brennan is your litigation counsel, true?
A. True.
Q. Mr. Brooks, if you could please bring up JX-113.
Mr. Tolnar, you remember this document from your direct testimony, correct?
A. I do.
Q. It's a presentation that Shoals delivered to investors in May 2023.
A. Yes.
Q. It's about the same time it filed this investigation, true?
A. It was, yes.
Q. In fact, the same month, yes?
A. Yes.
Q. As a public company, Shoals communications are accurate information to its investors, correct?
A. Correct.

Q. In fact, as a public company, you want your market share to go up and your stock price to go up, correct?

A. Yes.

Q. That would be your preference that the stock go up, correct?

A. It's part of our job.

Q. And if there are any inaccuracies, for example, in a document such as JX-113, this presentation to investors, Shoals would correct that inaccuracy, correct?

A. We will do our very best to locate and correct, yes.

Q. Let's turn to JX-113.8.

Now here, Mr. Tolnar, on that page 8, Shoals is telling investors that EBOS is an attractive segment, correct?

A. Yes.

Q. Seems pretty clear, right? The BLA is part of Shoals' EBOS system, right?

A. Yes.

Q. You consider the EBOS to be bread and butter, based on your testimony, of Shoals' --

A. Yes.

Q. -- sales, yes?

Now Shoals tells investors its, in part, EBOS is

attractive because it creates barriers to entry, right?

A. Yes.

Q. Right there, "barriers to entry." And that makes EBOS an attractive segment, is that it creates barriers to entry, true?

A. True.

Q. Mr. Brooks, if you could turn to page 12, JX-113.12.

Now here Shoals tells investors that it focuses on system solutions like the BLA, because system solutions create barriers to entry for competitors, correct?

A. That's correct.

Q. Once again, system solutions create barriers to entry for competitors, true?

A. Yes.

Q. In your investor presentation, right?

A. Yes.

Q. Now if we go to JX-113.23, that's page 23, Mr. Tolnar.

Shoals here informs investors that patents create a competitive moat around its business, right?

A. Yes.

Q. Now that moat isn't formed by the claims of the patent.

If we could highlight "The patent limits

competitors' ability to develop products." There we go.

Shoals wants to use its patents to prevent competitors from replicating the benefits provided by Shoals, true? That's what you're telling investors.

A. That's true. It's what I just described with direct.

Q. So you're telling investors that patents can stop competitors from replicating the benefits provided by Shoals, correct?

A. That is one of our competitive moats, yes.

Q. You understand patents and patent claims, they don't relate to benefits, do they? Yes or no?

A. No. I'd be happy to --

Q. You can on redirect, sir.

A. Okay.

Q. Thank you. Shoals wants to be the only company that can offer an alternative to the home run systems, correct?

A. We want to be --

Q. Yes or no, sir?

A. No.

Q. You want to be one of the only companies that offers an alternative to the home run systems previously deployed, sir? Yes or no?

A. We're not.

Q. You're okay with competition.
A. Yes.
Q. Okay. Yet you filed this lawsuit against both Voltage and Hikam competitors of yours, correct?
A. Correct.
Q. And you authorized that lawsuit.
A. Yes.
Q. And you authorized it based, again, three patents in this case initially, correct?
A. Correct.
Q. And two of them are no longer here.
A. Correct.
Q. If we go to page 113 -- sorry -- page 25 of JX-113. If we look at the growth strategy, right, this is your growth strategy, it says at the top, correct?
A. Correct.
Q. And it says over here, growth strategy number 1, it's to win customer and take share with BLA, right?
A. Yes.
Q. And Shoals is targeting 60 percent dominate BLA share in the market, correct?
A. Yes.
Q. And so seems like you guys think you're going to achieve growth, correct?
A. That's the goal, yes.

MR. CHAIKOVSKY: Your Honor, after this we should probably go on the confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving back to the public record.

BY MR. CHAIKOVSKY:

Q. Let's focus on the manufacture of wire harnesses, okay?

A. Okay.

Q. Shoals didn't invent wire harnesses, true?

A. True.

Q. In fact, during your deposition we discussed you use different injection molding machines in manufacturing BLA harnesses compared to manufacturing those harnesses made prior to BLA, true?

A. That's true.

Q. And so those injection molding machines for the BLA harnesses are different than for the prior harnesses, correct?

A. Correct.

Q. And the difference is that the BLA mold is a larger mold, it requires a larger injection molding machine for the undermold and overmold, true?

A. (Nodding head up and down.)

Q. And that's the only difference you identified in your deposition testimony, that it's a larger mold, correct?

A. I don't recall, but I would say yes.

Q. So the answer is -- so the answer is yes, sir?
A. Yes.
Q. And so just one more time, the BLA is a larger harness than your prior harnesses, just like the provisional application for the '153 shows, do you understand that? Yes or no?
A. The BLA is a larger harness, so it is a larger harness.
Q. Now Shoals didn't invent crimping wires or compression lugs, true?
A. That's true.
Q. And prior to the '153 patent, using molds to protect exposed wires had been done before, correct?
A. Yes.
Q. And Shoals didn't invent injection molding, true?
A. True.
Q. And it didn't invent the concept of protecting electrically exposed wires, correct?
A. Correct.
Q. Sir, not limiting my question to solar field, let's go broader. We have established your industry experience, right? Let's -- broader knowledge. Okay. So taking that into account. Talking about electrical fields generally.
Is that okay, sir?

A. Sure.
Q. Shoals didn't invent molds to protect joints, true?
A. True.
Q. Molds to protect joints electrically existed prior to the '153 patent, true?
A. True.
Q. Again, in that same context, Shoals didn't invent combining exposed wires from two or more cables and protecting those wires in a mold, true?
A. True.
Q. Let's now turn to Shoals' products. Actually, let's focus on one more thing before I get there.
Do you recall you testified in your direct testimony about one-drop BLAs, correct, sir?
A. Yes.
Q. And, sir, there were many options for the Big Lead Assembly being sold, right? One drops, two drops, three, correct?
A. Correct.
Q. In fact, you do sell a single-drop BLA. Yes or no?
A. No. We have one that I'm aware of in five years.
Q. Do you recall in your deposition --
A. Yes.

Q. Sir?
A. It is theoretically possible, yes.
Q. Do you recall in your deposition you testified that you still sell one-drop BLAs, yes or no?
A. I do recall that.
Q. And, in fact, when asked -- I asked you, do you know if a single-drop BLA is a big seller now.
Do you recall that?
A. I don't.
Q. Do you recall saying, sir, that a BLA itself, while multiple BLA molds that are based on the design of the solar field, whether it's two-drop, four-drop, eight-drop, the very end one may be a single drop or very first one may be a single drop?
A. I remember that.
Q. And you said that sir, yes?
A. I did.
JUDGE BHATTACHARYYA: Ms. Trinh?
MS. TRINH: Objection, improper impeachment.
JUDGE BHATTACHARYYA: I agree it's improper impeachment. I'm not sure it makes a difference.
MS. TRINH: May we strike the Q&A.
JUDGE BHATTACHARYYA: Yes, you can strike the Q&A.
I struck the last question and answer, and I

asked Mr. Chaikovsky if he could address this issue without using improper impeachment.

Q. In fact, we've seen, just before, we'll cover it, we've seen throughout this investigation so far this document, JX-119. I think it's been numbered two different numbers, right?

A. Yes.

Q. We've seen this document, right?

A. Yes.

Q. And it's providing to -- information from Shoals, right, about the BLA, correct?

A. Correct.

Q. And one of the options it's providing the world, sir, is a one-drop BLA, correct?

A. Yes.

Q. It exists, correct?

A. Yes, sir.

Q. It's an option for customers to purchase, correct, sir?

A. It is an option, yes.

Q. And Shoals believes that a one-drop BLA is covered by the claims of the '153 patent, true?

A. I don't know that answer.

Q. In fact, sir, do you recall, again, you testified under oath in your deposition, true?

A. I may have, but I don't recall that answer.

JUDGE BHATTACHARYYA: Ms. Trinh, is there an objection?

MS. TRINH: He is not a patent attorney. It's the same objection.

MR. CHAIKOVSKY: I'm going to establish what his testimony was during his deposition, Your Honor.

THE WITNESS: I don't recall the answer.

JUDGE BHATTACHARYYA: The objection is overruled.

Mr. Tolnar, you can testify to the extent you have knowledge.

THE WITNESS: Yeah. I don't recall. I don't have the knowledge.

Q. Okay. So let's pull up Mr. Tolnar's testimony at page 169, line 23.

Do you see where it says at the bottom, Mr. Tolnar, is it Shoals' position that the one-drop BLA is covered by the claims of the '254 and '153 patents? Do you see that, sir?

A. Yes.

Q. And your answer, sir:

"I would say it is part of the claim. Single-drop molds are part of the solution. They are not exclusively used, but they are part of the solution, whether it's one drop up to eight drops."

That was your answer, sir, yes?

A. Yes.

Q. At the time of your deposition, sir, you didn't know what market share Voltage had, correct?

A. That's correct.

Q. And, sir, Shoals has never used the word aperture in its documents other than the patents in this litigation to refer to pathways or holes inside of molds relating to the BLA, correct?

A. You're referring to marketing materials?

Q. Marketing materials, business documents, other investor presentations.

A. Yeah, not that I'm aware of, no.

Q. The only place you've seen aperture relating to the BLA or BLA technology is in the '153 patent and its patent family, correct?

A. As far as I know, yes.

Q. In fact, outside of the '153 patent family and in the context of the solar industry, have you ever seen the word aperture used in the context of molding layers in a wire harness anywhere in the solar industry? Yes or no.

A. Not that I'm aware of.

MR. CHAIKOVSKY: No more questions, Your Honor.

JUDGE BHATTACHARYYA: Thank you. Let's take our morning break. We'll be back in 15 minutes.

(The hearing recessed at 10:54 a.m.)

(In session at 11:10 a.m.)

JUDGE BHATTACHARYYA: Please be seated.

MR. BARQUIST: Your Honor, Your Honor asked for a paper copy of the list of admitted exhibits from yesterday. We have prepared that.

MR. COYLE: We prepared it.

MR. BARQUIST: We collectively prepared it and collectively approved it.

JUDGE BHATTACHARYYA: Okay. If you pass it up, that list is admitted.

MR. BARQUIST: Thank you, Your Honor.

JUDGE BHATTACHARYYA: I have before me a list of exhibits entitled "Admitted Exhibits" from March 18, 2024. Counsel has represented there are no objections to admission of those exhibits. Those exhibits are hereby admitted into evidence.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

MR. CHAIKOVSKY: Your Honor, I have one item just for clarification of the record, the demonstrative with the Shoals stock price and the institution of the investigation was RD-6.1 -- RDX-6C.1, as you can see here. I just wanted the record to reflect the document. And then the press

release is RX-752.

JUDGE BHATTACHARYYA: Thank you.

MR. CHAIKOVSKY: Thank you.

MR. SHIN: Your Honor, may I proceed?

JUDGE BHATTACHARYYA: Gentlemen.

EXAMINATION BY COUNSEL FOR ITC STAFF

BY MR. SHIN:

Q. Good morning, Mr. Tolnar. It's good to see you. I know it's better to see you in person than over Zoom. I'd like to follow up and ask you some questions.

I know yesterday you were asked some technical questions, so I'd like to start -- do you see the two physical exhibits in front of you, CPX- --

A. This one?

Q. Do you see the number on there?

A. 0036.1.

Q. Okay. So CPX-36 is the big one and then CPX-36.1 is the slice-through version; is that right?

A. Yes.

Q. Did counsel ask you questions about this yesterday?

A. No.

Q. Okay. So CPX-36, if you pick that up, please, you recognize that, right?

A. Yes.

Q. It's a four-drop line BLA?
A. Yes.
Q. And if you pick up CPX-36.1, you see it's a slice-through of that, of a similar four-drop line BLA; is that right?
A. That's right.
Q. Have you seen a slice-through like that before?
A. I have.
Q. In what context?
A. In our lab. We do similar things. For our products.
Q. All right. What other slice-throughs have you seen of BLAs, if anything?
A. We sliced this way and then we sliced this way, the way that you've shown.
Q. Okay. So both longitudinally and latitudinally?
A. Yes.
Q. So if you pick up --
A. I don't necessarily know why they slice them like that, but I've seen them.
Q. If you could pick up CPX-36.1 again and lift it up.

Are you familiar with the insides of the BLA?
A. Yes.
Q. So you see the feeder cable. If you pick it up,

I'd like to -- and maybe show the Judge as well.

Now you've got it sort of upside down. I don't know if it's upside down or not, but however the way you want to hold it.

A. Okay.

Q. Which way do you think is right side up?

A. Feeder cable on the bottom.

Q. All right. So you got the -- you're showing the feeder cable on the bottom, right, and the feeder cable extends from one -- from the left side of the overmold, the entire molding, and goes through the BLA to the other side, to the right side; is that right?

A. That's right.

Q. And is the feeder cable made of aluminum?

A. It is.

Q. Is it always?

A. We have provisions for copper as well.

Q. For what?

A. For copper as well.

Q. That you sell now?

A. Yes. I don't recall how much or how many, but we have the ability to do copper or aluminum.

Q. Okay. And in the middle you see a compression lug?

A. Yes.

Q. And what material is that made of?
A. I don't know that.
Q. Okay. So you're not familiar with the compression lug?
A. I don't know what material the lug is made of.
Q. You're not familiar with the technical aspects of the compression lug?
A. That's true.
Q. But you see the compression lug?
A. I see it, yes.
Q. And you know what I'm referring to when I say compression lug?
A. Yes.
Q. Are there other terms that Shoals uses for the compression lug?
A. I think that's what we call the lug.
Q. And then above the feeder cable do you see copper wires?
A. Yes.
Q. Are you familiar with those copper wires?
A. Yes.
Q. Those copper wires correspond to drop lines?
A. Yes.
Q. And here you have two copper wires that are sort of stacked on top of each other.

A. That's correct.
Q. Are the feeder cables always copper wires?
A. Feeders are always the top of the wire?
Q. I'm sorry. I'm sorry. I misspoke. Are the branch lines or drop lines, are they always made of copper wire?
A. I've not seen otherwise. Can they be? Yes. But I've not seen other than copper.
Q. And so in this exhibit, the aluminum feeder cable and the copper branch lines are not touching; is that correct?
A. That's correct.
Q. And that's important?
A. I assume so, yes.
Q. Okay.
A. I don't know if it -- I don't know the answer to that question.
Q. All right. So, like, if I say that technically the copper wires cannot be touching and crimped with the aluminum wire, do you understand -- does that make sense? Is that a truism?
A. Yes, but I wouldn't know why it makes sense.
Q. All right. And that's what I was going to ask you, if you knew why.
A. Yeah, I don't know why.

Q. But for each of the copper branch wires, do you agree that they go from the left side of the molding to the right side of the molding?

A. Yes.

Q. And they extend completely through that pathway?

A. Yes.

Q. But you don't see any gaps in the branch wires.

A. Well, on the outside there's a gap, this side, and then there's a little gap until they hit the lug, and then they are compressed together.

Q. All right. But you're certain, even if you can't see it there, that one wire forms two drop lines.

A. Oh, yeah, yeah. There's two wires running through that for four-drop wires. There's a window that's cut in the insulation.

Q. All right. And are you familiar with a three-drop line BLA?

A. Yes.

Q. Have you seen a slice-through of a three-drop line BLA? Have you seen technical documents about a three-drop line BLA?

A. Not -- not recently.

Q. Do you know how the inside wiring works in a three-drop line BLA?

A. I do not.

Q. Now let's pick up the CPX-36, the entire product.

Does this look like a new Shoals four-drop line BLA?

A. It does.

Q. In other words, is this a version that Shoals sells right now?

A. I would not know the difference, honestly. It looks like what we sell today, yes.

Q. Have you seen other four-drop line BLAs that look differently?

A. Not that I recall, no.

Q. Earlier, I think yesterday, counsel asked you something about manufacturing.

Are you familiar with the manufacturing process of the BLAs?

A. Some, yes.

Q. And counsel asked you questions about the molding and whether the same mold can be used for different drop lines, something to that effect.

Do you recall that?

A. I do.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: All right. We're moving back to the public record.

REDIRECT EXAMINATION

BY MS. TRINH:

Q. Mr. Tolnar, you were asked if patent claims relate to benefits.

Do you remember that?

A. I'm sorry?

Q. Mr. Tolnar, you were asked if the patent claims relate to the benefits in that slide you were shown.

Do you remember that?

A. Yes, I do.

Q. And you wanted to explain your answer.

Do you remember that?

A. I do.

Q. What did you want to explain?

A. Yeah, the claims that are in a patent enable the benefits. So the benefits themselves aren't -- not that I'm aware -- aren't typically in a patent, but it's the benefits that are derived by that product that enable the benefits to happen.

So when we talk about the BLA, the BLA has a number of claims associated with it, those claims enable the benefits that we talked through. So the benefits aren't

spelled out in the patent as a claim. The benefits are the result of the claims.

Q. Mr. Tolnar, are you a patent attorney?

A. No.

Q. Are you an expert in patent law?

A. No.

Q. Are you an expert in the domestic industry?

Sorry. Let me clarify. Are you a legal expert in economic domestic industry?

A. No.

Q. You testified earlier that BLA is a larger harness.

Do you remember that?

A. Yes.

Q. Is there a difference between BLAs and a component harness?

A. Yes.

Q. What's the difference?

A. The difference is the amount of current that it carries, the difference is that a harness doesn't eliminate a combiner box in and of itself, the BLA does. A BLA has multiple drops going into a lug that then is molded around that portion of the product in a harness -- harness has a mold but it's not -- to me it's not the same. It's trying to compare a scooter to a Mac Truck. They are just

different. They both have wheels and they both have an engine, but they're not the same.

Q. Do you believe innovation is important to Shoals?

A. Absolutely.

Q. Do you believe the BLA is an innovative product?

A. I do.

Q. How so?

A. Well, when I look at an innovative product, it's one that changes the market. There are many iterative products that sequentially change a market or a segment. When I look back at the results of the introduction of the BLA, I see that as revolutionary. I see that as a massive change. And that, to me, means it was very innovative.

Q. And earlier you were shown a slide about the stock price.

Do you remember that?

A. I do.

Q. And you wanted to explain the stock price, with relation to the filing of the complaint.

Do you remember that?

A. I do.

Q. What did you want to explain?

A. Can we get that diagram? I don't know how to ask the question properly. The stock price diagram.

JUDGE BHATTACHARYYA: If counsel wants to show it

to you, that's fine with me.

MS. TRINH: I believe that's RDX-6C.

A. In this section up here (indicating) there's two things I want to point out. One is the slope and then this dip.

This dip was caused by what was called -- what's called a secondary offering where our founder sold a substantial portion of his shares into the market. I don't remember the exact number, but it was a big number, probably close to a billion dollars worth of shares. That causes a massive drop in stock price.

And then the market recovers after it has the ability to absorb a big change like that. So that's what happened here.

And the stock was going up at the same incline when you take this section out. So I would have a really hard time saying that the fact that we announced the ITC claim was the cause for an increase from $20 to $25 overnight. It was associated with selling tens of millions of shares into the market and then the market absorbing that more so than the ITC claims.

Q. And then as you testified earlier about the press release and that you provided -- that that was part of the reason for the press release.

What is the other part?

A. Lazy and incomplete reporting by analysts and different clickbait social media. In a span of a week we saw headlines of Voltage wins claims for patent suit from Law 360. We saw analysts then feeding off of that announcement with partial information and not having whole information.

There's only two ways to deliver news to the market. One is to call a bunch of investor meetings with all the analysts and deliver the same message, which is really -- really isn't feasible. You do that in earnings once a quarter. The only other way is to issue a press release.

And so we felt that we had to get a press release out to basically say what we believe are the facts in the case and what our intention is regarding the case and clear up the sloppy reporting that was made in the marketplace. That is the fundamental reason why we issued the press release.

Q. Thank you, Mr. Tolnar.

A. You're welcome.

RECROSS-EXAMINATION

BY MR. CHAIKOVSKY:

Q. Only a few more questions, Your Honor, and Mr. Tolnar, and hopefully we'll be done.

I believe I heard you testify somewhere that

Shoals does not refer to the BLA as a harness.

Is that true? Yes or no?

A. We call it a BLA.

Q. You don't call it a BLA harness.

A. I tend to call it a BLA, and our marketing team calls it a BLA.

Q. Okay. This is a Shoals document.

Mr. Books, some help?

MS. TRINH: Objection. This is beyond the scope of redirect.

JUDGE BHATTACHARYYA: Could you --

MR. CHAIKOVSKY: During the testimony, as we went through direct and Mr. Shin's testimony, he would not refer to the BLA as a harness.

JUDGE BHATTACHARYYA: And that's --

MR. CHAIKOVSKY: Questioning, sorry.

JUDGE BHATTACHARYYA: That's where you're going with this questioning?

MR. CHAIKOVSKY: Yes.

JUDGE BHATTACHARYYA: Do you want to respond in any way, Ms. Trinh?

THE WITNESS: Can I ask a question.

JUDGE BHATTACHARYYA: I want to resolve the objection.

MS. TRINH: This is improper impeachment. The

document is a BLA harness assembly.

JUDGE BHATTACHARYYA: I'll let you proceed. The objection is overruled.

Q. I'm actually going to just say, you have no reason to doubt what I have in my hand is a Shoals document, do you, sir?

A. Not at all.

Q. It's JX-98, as you can see here, correct?

A. Yes.

Q. I want to focus actually on -- you can pull it up actually, probably better than me -- go to page 98 so we can -- sorry -- page 6. If we could focus on the top, page 6.

It says the Shoals BLA wiring harness. Do you see that, sir?

A. I do.

Q. It doesn't say anything else but wiring harness, does it? Yes or no?

A. Yes.

Q. So in this document, Shoals document, you refer to the BLA as a wiring harness, correct? Yes or no?

A. Yes.

Q. Okay. And, similarly, I want to show one more document. Let's pull up actually RX-96 but page 4.

That's a Shoals document, right? Do you have any

reason to doubt that, sir?

A. No reason to doubt that.

Q. And if we go to RX-96 page 23, do you see that?

A. I do.

Q. Do you see on the top it actually refers to the Shoals BLA Trunk Bus, right?

A. Yes.

Q. In fact, when referring to the Shoals BLA Trunk Bus, isn't the first reference to the "Typical Positive Harness," sir? Do you see that?

A. I do.

Q. So it's referring to the BLA as a harness, true?

A. Yes, it looks that way.

Q. In fact, down below that we see "Typical Negative Harness," true?

A. Yes.

Q. And that's a harness, right?

A. Yes.

Q. And that's Shoals, in its own documentation, referring to this as harnesses, true?

A. True.

Q. And do you realize, sir, that this document is the provisional application that led to the '153 patent, sir? Do you know that, sir? Yes or no?

A. No, I don't know that.

Q. Okay. Well, let's look at the cover sheet. Go to the cover sheet of RX-96.

Provisional application for the patent cover sheet filed by Shoals. And so within the provisional application Shoals has called this -- called these BLA harnesses, correct?

A. It looks that way, yes.

MS. TRINH: Objection, foundation. There's no reason -- they haven't put anything in the record that shows that he knows what this document is or that he has ever seen it.

MR. CHAIKOVSKY: It's referring to harnesses. Again establishing that Shoals referred to the BLA as harnesses, Your Honor, and what documents they have done it.

MS. TRINH: It also predates his employment by seven years.

MR. CHAIKOVSKY: Your Honor, this witness has testified on many questions with respect to the '153 patent both in deposition and here.

JUDGE BHATTACHARYYA: The witness is free to say he is not familiar with the document. If you want to try to establish his lack of familiarity, you can have another round.

MR. CHAIKOVSKY: In fact, on direct he provided figures of the patent, Fig. 3, for example, in the RDX

demonstrative.

MS. TRINH: We request that we strike his answer until foundation is laid.

JUDGE BHATTACHARYYA: The motion is denied. You may have another chance at redirect, if you want to establish your point.

Q. Let's go back to page 23. Do you see that, sir, where it's got the "typical positive harness" and "typical negative harness"?

A. Yes.

Q. And you provided several figures of the patent during -- they were on slides in your direct testimony, correct, the '153 patent? Do you recall that?

A. I can look back.

Q. Okay. I think if you look at slide 2, 3, one of those at the outset, right here, I guess slide 4.

A. Yes.

Q. It's Fig. 3 of the patent. Well, let's go to JX-89, Figs. 5 and 6 of the patent. Remember this image, it's the provisional. Those figures in the patent look like the exact document I just showed you with positive harness and negative harness, correct?

We can flip back and forth. Do you want me to do that?

A. Would you please?

Q. Yeah. So Figs. 5 and 6, let's focus on that, this is in the patent, JX-89, and let's go back to what's the Provisional Application, RX-96, typical positive harness, typical negative harness. Figures are substantially similar, if not identical, sir, aren't they? In fact, that typical joint detail, that turns out to be Fig. 7 of the patent.

So, in fact, what we have in here is Figs. 5, 6, and 7 of the patent.

Do you have any reason to doubt that, sir? This is Shoals' document.

A. I understand.

Q. Okay. So let's focus on these three images, typical positive harness, typical negative harness, and typical joint detail.

Do you see these three figures sir?

A. I do.

Q. Let's go to the patent. And you can look at Figs. 5, 6, and 7. If we can get 7 up there. You can put them all three up there together.

So go back to 5 and 6. Look pretty similar, if not identical, sir, don't they?

A. Looks can be deceiving. What I don't know is if that diagram is a diagram of a harness or a BLA.

Q. On the left in Shoals' documentation those

harnesses are -- or the Shoals BLA Trunk Bus, according to the document, correct, RX-96?

A. What I don't -- what I don't know, because I haven't seen this document, is, is it the Trunk Bus solution or the Trunk Bus BLA. There is a difference.

Q. Well, it says Shoals BLA Trunk Bus.

A. Okay.

Q. Do you see that on the top of the document?

A. I do.

Q. Okay. And that was submitted to the Patent Office, I'll represent that to you, and we see these images in the '153 patent.

Do you see that?

A. I do. I see clearly what's in front of me. What I don't know is the context around them.

Q. Okay.

MR. CHAIKOVSKY: No more questions, Your Honor.

MR. SHIN: Nothing further from Staff, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

Ms. Trinh, did you want to ask anything further?

MS. TRINH: No, Your Honor. Thank you.

JUDGE BHATTACHARYYA: Thank you.

Thank you for your time, Mr. Tolnar. You may step down.

THE WITNESS: Have a good day.

JUDGE BHATTACHARYYA: Thank you. You too.

MR. BARQUIST: Your Honor, at this time Shoals would like to play the deposition, the video deposition designations that we've discussed with the Court. The first witness will be Dean Solon, the inventor and former founder of Shoals.

(Clarification requested by the court reporter.)

JUDGE BHATTACHARYYA: The issue is whether you should be taking this down.

Does counsel have a view on this? We have the deposition transcript, so those are coming in with the relevant page and line numbers designated.

Do you still want a transcription of the video which has previously been described again?

MR. BARQUIST: I would defer to the court and the court reporter, Your Honor, what you prefer.

JUDGE BHATTACHARYYA: Does anyone else have a view on this?

MR. OU: Your Honor, for Voltage, we have no issue with just submitting the deposition testimony on the record. I think it's a short clip, and Your Honor has gotten enough context about the history of the company from the presentation already. So in the interest of time and also to move the evidentiary hearing forward, we would

suggest submitting the designations as we normally do.

JUDGE BHATTACHARYYA: Mr. Shin?

MR. SHIN: Your Honor, I can go either way, but it would seem like the transcript would be more complete if we did include the testimony, but another factor is whether any of this testimony is confidential or not. So that might play into it. But I can go either way, Your Honor.

MR. BARQUIST: We don't believe any of the video that we're playing today is confidential, Your Honor.

JUDGE BHATTACHARYYA: All right.

MR. BARQUIST: When we submit the written designations, we could indicate what parts of them were played on video so the record is complete, would that make sense?

JUDGE BHATTACHARYYA: Let's not have the court reporter write it. Just be very clear in your submissions as to exactly what portions of the deposition testimony were played.

MR. BARQUIST: We can do that, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

DEAN SOLON,

having been first duly sworn or affirmed on their oath, was thereafter examined and testified via video as follows:

(Video clips were played at the following

deposition designations:

81:6 - 81:12; 84-9 - 84:11; 87:19 - 89:10; 90:6 - 90:11; 93:21 - 94:18; 94:21 - 95:7; 95:8 - 95:12; 95:14 - 95:14; 95:20 - 95:20; 95:22 - 96:4; 96:6 - 96:14; 104:20 - 104:22; 105:2 - 105:5; 105:8 - 105:11; 105:13 - 105:21; 370:9 - 370:12; 370:14 - 370:22; 371:1 - 371:13 ; 365:2 - 365:18; 365:20 - 365:21; 366:2 - 366:6; 366:8 - 366:10; 366:13 - 366:15; 368:10 - 368:12; 368:15 - 368:22; 369:1 - 369:3; 369:6 - 369:10; 371:14 - 371:15; 371:17 - 371:18; 371:21 - 371:22; 372:1 - 372:5; 379:6 - 379:17; 380:1 - 380:22; 205:8 - 205:16)

JUDGE BHATTACHARYYA: Thank you. Were those the designations for both Complainant and Respondent together?

MR. BARQUIST: Yes.

JUDGE BHATTACHARYYA: I think it would be helpful if on the record you could state the page and line numbers that were just played. Is that possible for you to do, or is it possible to provide that after lunch?

MR. BARQUIST: It would be easier to do after lunch, yes, Your Honor. We'll do that.

JUDGE BHATTACHARYYA: I think for the record to be clear it would be good to have that identified.

MR. BARQUIST: We'll do that. And we also have a shorter clip from Mr. Jason Whitaker, who is also a former Shoals employee, former chief technical officer and former

CEO. I think it's about eight or ten minutes, Your Honor. Should we play that now?

JUDGE BHATTACHARYYA: Yes, please. Proceed.

JASON WHITAKER,

having been previously duly sworn or affirmed on his oath was thereafter examined and testified via video as follows:

(Video clips were played at the following deposition designations:

11:9 - 11:11; 18:10 - 18:12 - 23:9 - 23:11; 23:13 - 23:14; 25:1 - 25:4; 25:6 - 25:8; 25:13 - 25:15; 25:21 - 26:2; 27:4 - 27:11; 28:4 - 28:6; 293:12 - 294:6; 294:16 - 294:19; 294:22 - 295:5; 295:7 - 295:9; 296:9 - 296:10; 296:16 - 296:17; 296:19 - 297:7; 297:8 - 298:3; 298:6 - 298:9; 298:13 - 298:15; 299:9 - 299:10; 299:11 - 300:6; 300:10 - 300:10; 300:12 - 301:21)

JUDGE BHATTACHARYYA: Can you pause this for a second? I just wanted to confirm that this whole clip will be public and that we don't need to worry about CBI.

MR. BARQUIST: Yes, Your Honor.

JUDGE BHATTACHARYYA: Okay. Thank you.

Please go on.

(Video clip of deposition designations resumed.)

MR. BARQUIST: That concludes the video presentations, Your Honor.

JUDGE BHATTACHARYYA: Thank you. After lunch, if the parties could enter into the record the page and line numbers for the deposition transcripts that were played as well as the exhibit numbers for the deposition transcripts that will be submitted, that will help us have a clear record.

The next witness is Mr. Brooks; is that correct?

MR. BARQUIST: That's correct, Your Honor.

JUDGE BHATTACHARYYA: Why don't we take our lunch break now and then we'll proceed with Mr. Brooks after that.

(The hearing recessed at 12:38 p.m.)

A F T E R N O O N S E S S I O N

(In session at 1:38 p.m.)

JUDGE BHATTACHARYYA: Good afternoon. Please be seated.

Before we begin with the next witness, is it possible to put on the record the page and line numbers of the deposition transcripts that were played this morning?

(Clarification requested by the court reporter.)

JUDGE BHATTACHARYYA: I understand a copy of this information has been given to the court reporter, so that will be entered into the record.

If there is no other business, we can proceed with Mr. Brooks.

MR. BARQUIST: Thank you, Your Honor. Shoals calls William Brooks.

WILLIAM BROOKS,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. BARQUIST:

Q. Mr. Brooks, please introduce yourself to the Court.

A. My name is William F. Brooks. Everyone in the solar industry knows me as Bill Brooks, professional engineer.

Q. CDX-5C.2 is a copy of your CV; is that correct, JX-239?

A. That is correct.

Q. So your profession, Mr. Brooks, is an engineer?

A. That is correct.

Q. Are you a registered engineer?

A. I am.

Q. In what states?

A. Registered in California and North Carolina as an electrical and mechanical engineer.

Q. And how are you employed?

A. I have my own company, Brooks Engineering.

Q. Tell us a little bit about your educational background, please.

A. I graduated undergraduate in mechanical, Bachelor of Science, mechanical engineering, from North Carolina State University, who just recently won the ACC championship, not far from here, beating several schools in this room represented. Have to put that in there. It's March Madness, sorry.

And then North Carolina State University for my Master of Science degree, defended my thesis in 1992.

Q. And when did you begin working in the solar field?

A. 1988.

Q. And what did you do at that time?

A. I joined the North Carolina Solar Center, which was -- I was part of the founding staff of that organization at NC State University.

Q. And what did North Carolina Solar Center do?

A. North Carolina Solar Center was part of industrial extension as a land grant university, and we provided services information to the public of North Carolina about solar energy systems.

Q. How big was the center at the time you were there?

A. When I started, we started with three people.

Q. And by the time you left?

A. There was probably 15.

Q. What did you do after leaving the North Carolina Solar Center?

A. I moved to California and began to work with Endecon Engineering. Endecon Engineering was the foremost consulting firm, very small consulting firm, but foremost in the field of solar photovoltaic as it related to utility-scale applications, large scale solar.

Q. And what did you do while at Endecon?

A. I came to them to do training for the State of California for enforcement personnel in California to enforce the rules around photovoltaic systems, as well as

training installers of the electrical balance systems of these systems.

Q. And what did you do after Endecon?

A. In 2005, January 2005, I started my own company, Brooks Engineering.

Q. And you've been with Brooks Engineering ever since?

A. That's correct.

Q. What is the business of Brooks Engineering?

A. I do consulting for the solar industry in every aspect of the industry from the solar panels down to the inverters to the utility interconnection.

Q. And has your work involved the parts of a solar energy system that involves transmitting electrical energy from the solar panels to the electrical grid?

A. That is a major part of my business.

Q. Is that what's called EBOS?

A. Electrical balance of systems, some people shorten it to EBOS.

Q. And have you designed photovoltaic systems?

A. I have.

Q. On what scale, what's the range of size that you've designed?

A. Everything from 100-watt systems or 500-watt systems in India that I personally installed all the way up

to -- 20 megawatts is the largest system that I'm engineer of record on. So these are large-scale, 100-acre facilities.

Q. So can you explain to The court what a 20-megawatt system would be, what the size would be in general?

A. Yeah. Roughly 100 acres, and I think there was some discussion of that yesterday.

Q. So a hundred acres of panels and then the interconnection from those panels to the inverter; is that right?

A. Yeah. And I've worked on sites with 550 megawatts, Desert Sunlight, ten miles by ten miles, and all it is is solar panels, seven million solar panels in one area. It looks like a lake.

Q. Have you ever done any work for Shoals before?

A. I have not worked directly for Shoals.

Q. Have you seen Shoals products installed in the field?

A. Of course.

Q. On how many occasions approximately?

A. I couldn't count.

Q. Have you seen Voltage products installed in the field?

A. I have.

Q. And can you tell us approximately how many times?
A. Not exactly, several.
Q. Several, you said? Thank you.
A. They manufacture products other than what we're talking about here.
Q. Now in addition to your work with Brooks Engineering, or as part of it, do you work with professional organizations?
A. I do.
Q. And looking at the next slide, slide 3 in the demonstratives, what is the NFPA that's mentioned in the first bullet point here?
A. National Fire Protection Association is a very old organization that publishes the National Electrical Code. The National Electrical Code, which I've been involved with since the early 1990s, is the installation standard that covers all the requirements related to the installation of photovoltaic systems, which includes all the EBOS stuff that we're talking about today.
Q. You mentioned you're a member of the code-making panel for Article 690, 691, 692, 694, 705 and 710.
What do those articles relate to?
A. So Code-Making Panel 4 is one of several panels that the NFPA sets up to regulate the rules based on different equipment. Article 690 is photovoltaic systems,

Article 691 is large-scale PV electric supply stations. And then there's fuel cell systems, wind systems, and interconnected power systems, standalone systems. They are all under our purview.

Q. Your CV also mentions that you have been the chair of the NFPA Large-Scale PV Electric Supply Station task group.

Can you tell us what that is, please?

A. Yeah. About ten years ago I was asked by NFPA to chair a group of individuals, experts in the field, in the area of large-scale plants that we're talking about today to draft a new section, this is brand new to the National Electrical Code, that would deal with that area, and so we put together, and I helped draft that article for the National Electrical Code, and it was approved and put into the National Electrical Code in 2017.

Q. Your CV also indicates that you are a member of the Standards Technical Panel for certain UL standards, 1741, 3741, 1703, 2703, and 9540.

Tell us about your work on that panel, please.

A. So UL has been tasked by OSHA to provide standards to the solar industry. And so there is a variety of standards that I've been involved with, many of them since their inception, that relate to the solar industry. UL 1741 actually covers combiner boxes. We've heard a lot

about combiner boxes. It also covers inverters.

UL 1703 covers photovoltaic modules.

And then we're going to be talking today about UL 9703, and that standard covers wire harnesses related to solar photovoltaic systems.

Q. And where does 9703 fit in among the standards that you mentioned in your CV?

A. So as it has a 9703 in it, it is part of a family of standards that form their family from 1703, which is the module standard. There is, among the standards, a 6703 for connectors, and 9703 for harnesses.

Q. And you also mentioned that you're on the technical review committees for certain IEEE standards.

Tell us about that work, please.

A. So IEEE is the electrical engineering association in the United States, and they set standards as well, and these standards that we see here are related to utility interconnection.

The first ten years of my career was heavily involved in utility interconnection, because solar energy systems were not allowed to connect to the utility at all. Until we had that keystone in place, none of the rest of this mattered.

MR. BARQUIST: Your Honor, at this time we would tender Mr. Brooks as an expert on photovoltaic solar energy

systems, EBOS, and the electrical wiring for such systems.

JUDGE BHATTACHARYYA: Any objection?

MR. SHIN: No objection, Your Honor.

MR. OU: No objection, Your Honor.

JUDGE BHATTACHARYYA: At this time Mr. Brooks is admitted as an expert on photovoltaic solar energy systems, EBOS, and the electrical wiring for such systems.

Q. So, Mr. Brooks, tell us, how much of your consulting work in recent years involved serving as a testifying expert in litigation?

A. I've been involved in quite a few legal matters, but as far as testifying, 10 or 15 percent at the most.

Q. Have you ever testified in a patent infringement case before this trial?

A. I have not.

Q. In your 35 or 36 years in the solar energy field, do you have any knowledge about Respondents' expert Dr. Kimberly Cameron and her work in the solar field?

A. I can't recall running into her.

Q. How about Respondents' expert Thomas Kenny, have you come across him in your work in the solar field?

A. I have not.

Q. How about Joshua Weiner, one of Shoals' experts, do you know Mr. Weiner's work in the solar field?

A. I believe I met him at least 10 to 12 years ago.

He was attending one of my classes.

Q. On the screen we have the definition of a person of ordinary skill in the art that the Court has adopted.

Are you familiar with this definition?

A. I am.

Q. And do you believe that you are at least a person of ordinary skill in the art?

A. At least.

Q. Now what was your assignment in this matter as it relates to the '153 patent?

A. I was very much focused on the study of voltage in Shoals Trunk Bus products to evaluate whether they practice the claims of this patent, '153.

Q. Now have you read the Markman order or the Claim Construction Order that the Court has issued in this matter?

A. I have.

Q. And up on the screen we have summarized a few of the key orders from the Court's Markman order, about aperture, about a second and third aperture, and about the primary mold.

Are you familiar with those rulings by the Court?

A. I am.

Q. And are you able to apply those rulings in your testimony today?

A. Absolutely.

Q. And does anything about the claim construction rulings that the Court has adopted changed your opinions about whether or not the '153 patent is practiced by either Shoals or Voltage?

A. Not at all.

Q. Now in your work you did use the definition for aperture including the words all or part of a pathway.

Do you recall that?

A. I do.

Q. And, of course, the Court has adopted, not all or part, but entire.

Are you aware of that?

A. I am aware.

Q. Does that change your conclusions at all in this case?

A. Not at all.

Q. Are you able to apply the entire pathway construction?

A. Absolutely.

Q. Can you explain why that doesn't affect your conclusions in this case?

A. As it relates to the '153 patent, I believe it's consistent and it works.

Q. Will you apply the Court's constructions and all the other materials in the '153 patent from the perspective

of a person of ordinary skill in the art?

A. I will.

Q. Do you see on the bench next to you a sample of a BLA mold drop?

A. I see a mold drop.

Q. Is that CPX-36?

A. It is.

Q. Would you point out the salient features of that device for the Court, please?

A. Make sure I have my glasses here. Sorry. I do.

The salient features of the mold drop is -- there is an attractive symbol on it. The salient features are that it has drop lines, it has a feeder cable running through it, it has, in this particular case, has four drop lines that enter into the mold drop, and the purpose of those, those are inputs into the mold drop where they connect to the business end of the feeder cable.

Q. Now you mentioned that that's a mold drop.

Is what you have in your hand the entirety of the BLA as claimed by the '153 patent?

A. Absolutely not. And I've heard the term used many, many times interchangeably that this is a BLA. This is absolutely not a BLA. This is simply a mold drop that's part of a larger assembly. BLA stands for Big Lead Assembly. Sorry.

Q. So what's the distinction you're trying to make?

A. I'm trying to -- yeah, make the distinction that we've got to be very careful about calling this the BLA or the Voltage products, and to be more precise, my whole world is about precision in language with codes and standards, and the world of patents is all very about precision words, and so we need to be precise about how we use our words.

Q. So what would a BLA be if that's not a BLA as claimed by the patent?

A. We've seen many pictures of examples of that, but the BLA would include typically several of these. As we can see, we have little tiny wires connected to a really big wire. The idea is that we're going to connect a bunch of solar panels into this really big wire and we're going to load it up to a maximum number of inputs, and then that maximum number of inputs, when we have reached that maximum, we're going to take that on to either the inverter or to -- we've seen examples of a disconnect device, and there you see that in the slide, right in the middle, that disconnect device.

Actually, I've been involved in making sure that disconnect device is involved in a lot of plants we see.

Q. Using slide 8 from the demonstratives, which is from CX-167, can you explain what you mean by a BLA versus just a mold drop?

A. Okay.

Q. Do you have a pointer?

A. I do. Look at this, this is some cool technology.

So these are mold drops, as we've been saying. I can see -- it looks like there's one right there. It's hard to see. There is a total of six mold drops in that picture. And it's showing them on a reel. It looks like we would call that a drop line. There's a couple drop lines in these mold drops.

And we see the same thing down at the bottom. Down at the bottom there's a series of, looks like, six mold drops. And, yeah, and what happens is they pick up the power from the solar panels and they deliver them, in this case, to a disconnect and then on to -- this big box over here is an inverter, connected to a transformer right there.

Q. So let's take it one at a time. You were looking in the upper left corner at JX-116C. Just, again, to be very clear, what does that illustrate?

A. This is showing an example of a part of a BLA. The reason I know it's not the whole BLA is because they are showing a cut end here. So that would end up -- that would typically end up installed in this box here, and the other end of it would have to have some kind of a cap on the end of it for the whole BLA to be an assembly.

Q. And in that upper left-hand image, is that one BLA or two BLAs?

A. It's difficult to say. I heard some earlier testimony that it's possible it could be a positive and negative. But you can't get dogmatic about that. Often the positives are red and the negatives are black, but it could be a positive and a negative.

Q. And then in the lower part of slide 8, can you kind of draw a circle or draw a box around what would be the BLA that you see there?

A. Okay. So down here the BLA is going to stop at the connectors here, and the BLA is going to move from here to here. In this particular example it actually ends at the disconnect box, and that whole thing is a BLA. So when we say BLA, this is what we're talking about.

Q. And then in the upper right corner of slide 8, which is from JX-99, can you, again, point out what the BLA or lead assembly is?

A. Yes. So the Big Lead Assembly in this case, and this looks like it's a positive and negative, this particular example, I would assume is -- normally we fuse the positive side. I'm involved with the regulations around fusing. But we do have some arrays that had to be negatively fused. So it could be a positive or negative. This would be the fused side and this would be the unfused

side. One is positive and one is negative.

Q. So that illustrates two BLAs, one positive and one negative; is that right?

A. I believe we heard that these -- they are sold in pairs, because you have to have a circuit. So you can't sell just one side of it, a positive or just a negative. They always go in pairs. They always travel together. And I think in every picture we've seen, especially with the red and black, we'll see a red and a black, and they are traveling in pairs.

Q. Okay. Do you also see on the bench next to you, Mr. Brooks, a Voltage LYNX Trunk Bus?

A. I believe that's what this is.

Q. And is that CPX-24?

A. It is CPX-24.

Q. And can you point out the salient features of CPX-24 for the Court, please?

A. Am I permitted to unband this?

Q. Yes. Thank you.

A. Okay. So this is, again, a mold drop. This would not be the Trunk Bus. This is just one little piece of it. And it has a feeder, the large feeder cable through it, like we saw before, and it's got drop lines, inputs into the feeder, and then inside here it has a connection to the feeder and it's molded around that.

Q. And can you tell us what size of Trunk Bus this one is, CPX-24?

A. It's a 400 KCMIL or MCM, and it says it right there on the wire.

Q. And how many drop lines?

A. Appears to have two.

MR. BARQUIST: At this point, Your Honor, we need to go on the Voltage confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

MR. BARQUIST: Yes, please. Can we bring back the Shoals people, please.

BY MR. BARQUIST:

Q. We're going to turn to looking at the Shoals products and the technical domestic industry question.

Mr. Brooks, did you examine some of the Shoals products at issue in this case?

A. I did.

Q. And did you summarize your conclusion in your expert report?

A. I did.

Q. So on slide 115 we have excerpts from your report at JX-188C and JX-243C?

A. Yes.

Q. And what did you find, sir?

A. That the Shoals BLA harness practices at least one claim of the '153 patent and it's in my claim chart.

Q. And what did you do to analyze the Shoals product?

A. Well, here's some examples of it right here. I'm holding in my hands some of the samples cut -- cut a couple samples myself.

Q. Can you identify what you're holding by -- there's a sticker on it.

A. This is CPX-036.1. This other sample is CPX-036.3. I can see that this is the one that I personally cut.

Q. When you say "this one," please state the exhibit numbers.

A. I'm sorry. CPX-036.3 is the one that I cut. And I believe -- my understanding is that 36.1 was cut by Shoals.

And in this picture 36.3 is the second one down in the picture, and 36.1 is the lowest one in that picture. And these are the actual devices.

Q. And by "picture" you're referring to the demonstrative number 116?

A. That's right. And it lays those out. And then there's additional exhibits here. This is the CPX-36 that I'm holding in my hand, which is the top one in the picture. And then there's another one, and I believe it's the one sitting right there.

MR. BARQUIST: May I, Your Honor?

JUDGE BHATTACHARYYA: Yes.

A. This one is labeled CPX-0036.2, which is the third one down from the top.

Q. Can you also identify for the record CPX-36.4?

A. Okay. So CPX-36.4 has a red feeder cable coming through it, mold drop, and eight drop lines, counting four

on each side.

Q. Can you also identify for the record CPX-36.5?

A. This is CPX-36.5, and it has the feeder with two mold drops.

Q. Can you also identify CPX-36.6?

A. This is my old friend that I cut perpendicularly, a section of the device. It includes three pieces.

Q. And other than the exhibits we just identified on the record, did you observe any other samples of the Shoals BLA product in your work?

A. Yes. Many samples at the manufacturing facility. I believe at least one of these samples was at the counsel's office. And at the manufacturing facility I looked at multiple BLAs under construction, showing all different types of mold drops, all different levels of their construction from just the nexus connection through the inner mold, overmold, the entire assembly.

Q. Just to make sure, Mr. Brooks, 36.5, how many drop lines does that one have? That's the one that you cut on the perpendicular?

A. Just making sure I have the right one. I know you lawyers will get me in trouble. This is 36.6.

MR. BARQUIST: May I, Your Honor?

A. Sorry. Am I missing something here? Sorry. Got too many samples up here. All right. Thank you.

Q. How many drop lines does 36.5 have?

A. 36.5, count them, ready, one, two.

Q. Thank you. I interrupted you. You were talking about your visit to the factory and what you saw there.

A. Yes. So I visited the factory, got to see manufacturing the BLA system, lead assembly system. Got to see the molding machines, the crimping processes, all those things, and to see it in multiple parts of the manufacturing process.

Q. And by that do you mean you saw it both after it had just been undermolded and before the overmold had been put on?

A. Yeah, and I believe there's an undermold picture in my claim chart as well as these cross-sections and all.

Q. Okay. So is there a -- which model or version of the BLA mold drop did you use in the claim charts attached to your report?

A. This is 36C1 -- 36.1, which is this one right here. So this is what you see on the screen, the two halves. If you put them together, you can see that's the one in the middle and that's the one on the right.

Q. What do we see on the right side of slide 117 in CDX-5C?

A. So the one on the right shows the end view, and there are actually two drop lines coming out of that, and

then there's two more circles there, and those are where you would -- if you had eight drop lines, like you see in 36.4, they would come out those lower holes. It's part of the molding.

Q. So let's -- did you also consider in your analysis a data sheet for the BLA assembly?

A. I did, yes. So this is the data sheet. I believe we've seen this a couple times today.

Q. So this is excerpts from JX-119; is that right?

A. That's correct.

Q. And what did you glean from the data sheet, Exhibit 119, JX-119?

A. Well, there's all kinds of information on here. I don't want to go through it in detail, but so it talks about the size of the drop lines, the number of drop lines.

This particular version of it goes up to 600MCM wire gauges on the feeders. And then it shows different options for different numbers of drop lines. And I believe we've discussed that before.

This is six of the eight that would be available from one to eight in a BLA system. And it's only showing part of a BLA, and we talked about the fact that a BLA is not just the mold but it is the entire assembly.

Q. Let's look at the actual product in the claim of the '153 patent.

So, again, claim 1 calls for a lead assembly for use in a solar energy installation including, first of all, a drop line terminating at a drop-line connector. Did you find that in the BLA product?

A. I did. And this particular example is very similar to the one we see in the top, and it may be the exact same one, in fact. This is the CPX-0036. We see the connectors as we see in the picture. In this picture it's showing a four, a three, and a two.

Q. So you're referring to the JX-186 depicted on slide 120?

A. Yeah. This slide shows a different drop line with different drop-line connectors.

Q. Is the drop-line connector in the Shoals BLA configured to connect with a central trunk of a wire harness, the central trunk of the wire harness having a plurality of branches that each are configured to electrically connect to a separate solar panel contained in an array of plurality of solar panels?

A. Yes. And, again, we have seen this lovely figure in the past, and it's showing all those same things, and, again, the connector is the key item that allows it to be connected to a wire harness.

Q. And you're referring to CX-167 depicted on the slide?

A. That's correct.
Q. And also to paragraphs in your report, JX-188C?
A. That's correct.
Q. The next element is a feeder cable electrically coupled to the drop line at a nexus.
Did you find that in the BLA product?
A. I do. In the top picture of this information here we see, JX-0136, with the feeder cable going through the nexus -- I'm sorry -- through the mold drop, and we also see a cut -- the cut version that we've been talking about, and the feeder cable proceeding through and electrically coupled to the nexus, because we can see it here. It's not covered up.
Q. You're referring to CPX-36.1C as illustrated on this slide?
A. That's correct.
Q. All right. And the next element is an undermold that fully encases the nexus.
Did you find that in the BLA product?
A. Yes. In fact, this picture is a bit small. It's from my report. But here we see the undermold. It looks very, very similar to the outer mold, as you might expect. And so we see the undermold material. It's actually a softer material in this case. And that fully encases the nexus. You can't see the nexus in here.

And down here in the cross-section we see that the nexus is approximately in this area here (indicating), and then the undermolding material is this slightly lighter gray color, and then we have a darker gray or almost black color for the outer mold.

Q. So using the pointer can you kind of outline for the Court where you see the undermold?

A. So, yeah, as I was showing right there, it's hard to show with this, but there is that difference between the light gray and the dark gray all the way around, that would be the interface.

Q. Okay. We'll come to the interface in a moment.

Again, just for the record, the illustration on this slide is JX-243C, JX-162, JX-121, and CPX-36.1.

So the next element is that the undermold has to further comprise a first aperture extending completely through the undermold and having a first diameter, wherein the feeder cable extends through the first aperture along a first longitudinal axis.

Now did you find this element in the BLA product?

A. Yes. So here's that feeder cable proceeding through. It's got its own aperture and it's got a nexus and it's got a longitudinal axis.

Q. All right. And, again, for the record, this is JX-243C, JX-162, JX-121, CPX-36.1, and JX-118C illustrated

on the slide CDX-5C.124.

The next element is a second aperture extending partially through the undermold and having a second diameter different than the first, wherein the drop line extends from the second aperture along a second longitudinal axis.

Can you explain how you found that in the BLA product, sir?

A. Again, here's the first aperture. It's got a first diameter. The second aperture related to drop line 1. A little more difficult to see. We're looking at the insulation jacket on here. We can see copper on the one below it, but we're focusing on this.

And so the diameter of that insulation jacket would be the aperture diameter, and the drop line extending from the second aperture along a second longitudinal axis, not the same axis as that one.

Q. So this is an image from your expert report, correct, sir?

A. It is.

Q. And just so we're really clear, because we have that red arrow there, can you, as best you can, using the pointer and explain to the Court exactly where you see the second aperture and how it extends partially through the undermold?

A. Okay. The second aperture, again, is that darker

black material. We can see that the red ones are a lot easier to see, but the dark black here is the insulation on the feeder. The dark black here is the -- below it is the insulation on the drop line.

And so the diameter of that, which is defined by the outer jacket of the drop line, determines the actual diameter of the aperture.

Q. And where does the drop line, this first drop line, begin in your opinion, sir?

A. Well, again, these are all inputs, but the drop line in this particular -- this particular claim extends out from the nexus, as we saw on the Voltage product. We saw it out from the nexus, out through that second aperture along a second longitudinal axis. It starts here at the nexus and works its way out to the edge.

Q. It starts at the nexus?

A. It starts at the nexus here and goes out to the edge.

Q. Again, explain as clearly as you can using the pointer and your explanation where the -- where you find the second aperture to begin and how it extends partially through the undermold in your opinion.

A. So the second aperture, again, is defined by the cable, and it extends partially through the undermold from the outside of the undermold to the nexus, right there

(pointing).

Q. Now when you say the second aperture is defined by the cable, what do you mean?

A. So the drop line that comes in into the nexus here, the molding material goes around it and forms the aperture, and so that aperture extends partially through that undermold, because it stops -- the aperture stops at the nexus.

So the aperture proceeds from the edge to the nexus, and the diameter of the aperture is the same as the drop line cable diameter, and then when it's stripped, of course, that aperture next down before it gets to the nexus.

Q. Let's look -- here, again, in the next slide, it's perhaps a little clearer to point out where the drop line and the first and second diameter are.

A. Yeah. So this is showing the first diameter out of the report and the second diameter out of the report, just since it's difficult to see, and the drop line coming in at that point.

Q. All right. And the next element is a third aperture extending partially through the undermold and having a third diameter different than the first diameter, wherein a second drop line extends from the third aperture along a third longitudinal axis.

So here on slide 127 we have another image from

your report, JX-243C. This is JX-121 and CPX-36.1.

Can you explain how you found a third aperture in the BLA product?

A. Okay. So, first, second diameter, third diameter of an aperture. This is the third aperture having to do with the second drop line, the third diameter.

Q. Okay. So where does the third aperture begin and end so that it extends through the undermold?

A. So the third aperture extending partially through the undermold and having a third diameter that's different than the first diameter.

So we would say, again, we have the nexus here, the wire has been stripped off, and the drop line, drop line 2, proceeds through the third aperture from the nexus to the outside of the undermold.

Q. And did you find that the entire pathway of the second drop line extends only partially through the undermold?

A. Yes, the entire -- the entire pathway of the drop line only goes partway through the undermold and terminates at the nexus, because at the nexus there is no aperture where the undermold is surrounding the drop line.

Q. All right. The last of claim 1 is an overmold surrounding the undermold forming an undermold-overmold interface at the outer surface of the undermold.

Did you find that in the BLA product?

A. I did. There's, again, that undermolding material, and we tried to point that out that there you see an arrow to the undermold, an arrow to the overmold.

Q. And then in the next slide, 129, what do we see here?

A. A little easier to see here. That light gray material being the undermold and the darker gray or black material being the overmold that we see here in front of us.

Q. And this image on slide 129 is from your expert report; is that right?

A. This is, yeah.

Q. JX-243C and JX-120?

A. Yes.

Q. Let's look at claim 21, if we could.

Also with regard to the BLA product, claim 21, again, is a system claim, a solar power system comprising, a plurality of solar panels each electrically coupled to one of a plurality of branches of a wire harness to form a first solar array.

Did you find that element met with regard to the BLA product?

A. I do. And this particular figure is becoming familiar. And so we see the BLA connecting to a plurality of branches through these component harness in this

particular picture.

Q. You're referring to the image from CX-167 on your -- in this slide, 131?

A. I am.

Q. And that's referenced also in your expert report?

A. Yes.

Q. Then there's also a requirement in claim 21 of a lead assembly comprising a drop line electrically connected to a central trunk of the wire harness configured to receive power from the plurality of solar panels, a second drop line electrically connected to a central trunk of a second wire harness also configured to receive power from a plurality of solar panels and a feeder cable.

Did you find these elements in the BLA product?

A. So here we see the two drop line mold, several -- 6 two-drop line molds, and those are bringing the power from the solar panels into a central trunk line.

We're going to make solar plant engineers out of you yet, and it's going to come into in this case -- that BLA is going to terminate at the disconnect switch.

Q. All right. Next, the feeder cable has to be electrically connected to the drop line and the second drop line at a nexus. And you found that in the BLA product?

A. Yes. Again, there's the feeder cable. Can't see the nexus until we cut it apart. There you see the nexus

electrically --

Q. Referring to JX-163 at the top of the slide and JX-121 and CPX-36.1?

A. That is correct.

Q. Okay. And then, again, claim 21 requires a primary mold that fully encases the nexus so as to substantially seal the nexus from external environmental conditions.

Did you find something that meets the primary mold limitation of claim 21?

A. Yes. Again, we don't see the nexus, so this is enclosing and sealing the nexus, primary mold.

Q. And what part of the BLA performs that function?

A. The primary mold in the mold drop.

Q. Is that the same thing we called the undermold in the earlier analysis?

A. It is in this particular case.

Q. Next is a first aperture extending completely through the primary mold having a first diameter, wherein the feeder cable extends through the first aperture.

Did you find that in the BLA product?

A. I do. There's our feeder, and it's got a diameter, and it extends completely through.

Q. Okay. Again, referencing the images on slide 134, JX-243C, JX-121, JX-162, and JX-118C and CPX-36.1C,

correct?

A. Yeah. Yes, they are all shown there at the bottom of the image.

Q. Next the claim requires a second aperture extending partially through the primary mold having a second diameter, smaller than the first, wherein the drop line extends into the second aperture.

Did you find that in the BLA product?

A. I did. The aperture, maybe on the next slide, there's the second aperture we saw before again explaining that slightly darker color related to the insulation and extends partially through the primary mold in this case having a second diameter wherein the drop line extends into in this case -- it just says it differently.

So now, again, a little more accurately in that it's an input into the nexus, because that's the whole purpose of a drop line. Once it's done its job and gotten to the nexus, it's done.

Q. Why do you say that second aperture extends only partially through the undermold?

A. Because in this case it ends at the nexus, when it's done its job in sealing the drop line getting to the nexus.

Q. And are you applying the entire pathway of that second aperture in your analysis?

A. Yes. Yes, sir.

Q. Lastly, claim 21, there is a requirement of a third aperture extending partially through the primary mold having a third diameter smaller than the first, wherein the second drop line extends into the third aperture.

Did you find that in the BLA product?

A. Yes. We saw that earlier. And there is the third aperture in the example. And the drop line, again, extending into this third aperture making its way to its goal, which is the nexus.

Q. And are you applying the entire length of the pathway of the third aperture in your analysis?

A. I am.

Q. And how do you conclude that it only partially goes through the primary mold?

A. Because the drop line clearly ends in the nexus somewhere and its aperture to get to the nexus ends -- the aperture to get to the nexus extends through the undermold -- or the primary mold, sorry.

Q. Okay. That's all I have for you, Mr. Brooks. I think we've gone through all the claims. I'm going to turn you over to Mr. Ou.

Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. OU:

Q. Good afternoon, Mr. Brooks.

A. Hi Phil.

Q. Mr. Brooks, I want to start with just the process of how you came to form your opinions. Is that okay?

A. Yes.

Q. And I want to make sure, tell me if I have this wrong, but, from your definition, my understanding is you were hired by Shoals after the lawsuit was filed; is that right?

A. That is my understanding.

Q. Right. So you have no input into the preparation of the complaint, right?

A. Preparation of the complaint, no.

Q. And I think in your deposition you said you got involved in the investigation starting to look at products probably in the August time frame; is that right?

A. I believe that's consistent with my deposition.

Q. And you issued your expert report on infringement and technical domestic industry in December, right?

A. Yes, sir.

Q. And between August and December you're aware that there was claim construction briefing in this investigation, right?

A. Yes.

Q. That led to the Markman order that there was some discussion about, and that was in the Markman hearing was in December, right?

A. Yes, sir.

Q. And you weren't involved in the claim construction process, meaning you did not provide any opinions as part of Shoals' claim construction briefing, true?

A. I don't recall doing that.

Q. You did provide input to Shoals for Shoals' infringement contentions, meaning Shoals' claims of infringement and technical domestic industry, before it got to your turn where you do your expert report.

Do you understand what I'm talking about?

A. Vaguely. But as an expert I was involved in helping them sort through the information, if that's what you're referring to.

Q. Right. Ultimately, you served -- ultimately, you were given evidence, you looked at the evidence, and then you formed your own opinions as an expert, right?

A. That's correct.

Q. But prior to that you were involved and you did know what evidence that Shoals had, you spoke to them about it, and you were aware of the theories that they had before

you issued your expert report, true?

A. Before I issued my expert report.

Q. Right. My point is that you did not just independently look at all of the evidence and come to your opinions in your expert report outside of what Shoals' claims were in this investigation.

You were aware of what Shoals' claims were, and then, of course, you looked at the evidence and came to your own opinions, right?

A. I am a very opinionated person.

Q. So you had in mind Shoals' infringement contentions and the evidence that they had, and then, ultimately, you issued your own opinions in your expert report, true?

A. We discussed my opinions. I don't exactly understand where you're going with that.

Q. Okay. I'll move on. We'll come back to it, if we need to.

Now, Mr. Brooks, when you issued your expert report in December -- let's talk about Shoals' BLA product. There were a few four-quad drop BLAs that you had cut open and looked at, right?

A. No, they were not quad drops, I don't believe, no.

Q. What were they?

A. This one is actually the one that I cut open here that I'm looking at is a two-drop. So I'm holding in my hand CPX-0036.3. This is the one that I cut and it has two drops.

Q. 36C.3, that is a BLA of Shoals that was provided to you, and that's one that you cut open.

A. This one I am confident is one that I cut open lengthwise.

Q. And that is one that has two drops or two inputs?

A. Two inputs. You can see them right there. I don't want to misstate. Don't get me on it.

Q. I appreciate the clarification. Okay.

You also looked at Shoals' documentation; is that right, sir?

A. I did.

Q. And I think in your expert report you have a List of Materials Considered; is that right?

A. I do.

Q. And that includes a table of documents produced by Shoals, right?

A. All kinds of documents, yes, sir.

Q. Technical documents, marketing documents, sales documents, right?

A. And we talked about those at the deposition.

Q. Right. And that was part of the evidence that

you considered in forming your opinions, right?

A. Yes.

Q. Now between the time of your expert report and this hearing, is there any new evidence that you considered in forming your opinions that you gave today in court?

A. Any new information, what is your definition of "new information"?

Q. For example, additional documentation, documents, from Shoals.

A. I believe that everything I've relied upon in my opinions at this point are on that list.

Q. Okay. Nothing else that you can think of sitting here today?

A. Not that I recall.

Q. Okay. Now your slides, the presentation that you just went over with Mr. Barquist, you prepared those slides with Shoals' legal team, right?

A. I did.

Q. Those are still your opinions, but, of course, there is graphics, lawyers that you guys worked together to put that together, right?

A. That's correct.

Q. Now in your slides as well as in your claim chart of your expert report every single input or branch or lead is labeled a drop line, right?

A. Can you restate the question?
Q. Sure.
Your Honor, can I approach?
JUDGE BHATTACHARYYA: Yes.
Q. So, Mr. Brooks, I'm looking at CPX-0036.2.
A. Okay.
Q. This is a BLA mold drop.
A. Yes.
Q. We can all agree that's what we'll call it. It has a big cable and there are four inputs, right?
A. That's correct.
Q. I think you used the word "input," and I've seen input in Shoals' documentation. No dispute here that this is one input, two input, three input, four input?
A. True.
Q. Were you here yesterday when Mr. Macias who has been working at Shoals for about ten-plus years testified? Did you hear his hearing testimony?
A. I do remember his testimony.
Q. Do you remember I asked him what are the most common ways that Shoals refers to these inputs or branches, or whatever we call them, and he said "input leads and drop lines." Do you remember that?
A. I believe that's correct. That sounds -- I'm sure we could look at the record, but that certainly doesn't

sound like you're changing the record.

Q. Sure. You would agree with me that at least he said that drop lines was one of the primary ways that he referred to each of these branches or inputs, right?

A. I think in the literature that I've looked at I haven't seen the word "drop lines" used a lot. Again, one of the problems we have here in, you know, patent language versus real-world language --

Q. Mr. Brooks, if I may, if I may, because this is cross-examination, I'm going to try to keep my questions to yes or no. There will be times where maybe it might be helpful for me for you to explain, but if I don't give you a chance to explain, Mr. Barquist will definitely give you a chance to explain more.

A. Okay. Sure.

Q. So you would agree that in this investigation, in this hearing that we've had this week, there has been a lot of discussion from Shoals, Shoals' lawyers, Shoals' witnesses, that have called the small wires, cables, inputs, right?

A. Yes.

Q. If I use inputs, we all know what we're talking about, right?

A. Absolutely.

Q. And I think everyone in this courtroom knows that

there is a dispute about drop lines and whether or not if a single cable can form two inputs, whether that's one drop line or two drop lines, right?

A. I'm sure the Respondents disagree on that. I don't know that the Markman order or the --

Q. I'm not asking you to characterize the position. I'm just -- you understand that that's a live issue, right?

A. Absolutely.

Q. Okay. We're on the same page.

Now my question is, sir, you looked at evidence from Shoals. Have you seen any documents from Shoals, whether that's marketing documents, sales documents, technical documents, drawings, schematics, that calls each of these inputs a drop line?

A. For the same reason I started my answer before, it's absolutely irrelevant.

Q. So you haven't seen any literature, documents, anything from Shoals that calls these inputs a drop line, right?

A. You're comparing patent language to real-world language, and that's not the way the real world works.

JUDGE BHATTACHARYYA: Mr. Ou, if you would like a yes or no answer --

MR. OU: Your Honor, yes.

JUDGE BHATTACHARYYA: -- then say, I'd like a yes

or no answer, and you should answer either "yes," "no," or "I can't answer."

THE WITNESS: Okay.

MR. OU: Thank you, Your Honor.

Q. Mr. Brooks, you would agree with me that you have not seen in any Shoals' documentation, whether it's marketing, technical, sales, drawings, any documentation produced in this investigation that refers to one of these inputs as a drop line, yes or no?

A. I don't recall.

Q. Would it surprise you, sir, if during your direct testimony I had people on our team look through every single Shoals document that was on your List of Materials Considered and there was not a single instance that drop line was found to refer to one of these inputs beyond what is in the actual patent -- the patent application? Would that surprise you, sir?

A. Not in the least. It would not surprise me at all. I would expect that.

Q. So you don't need to fight me on it. So we can agree that the patent calls this input a drop line, right?

A. Yeah.

Q. Okay. And the patent application calls it a drop line. But in Shoals' documentation, you haven't seen them call this a drop line, right?

A. Which documentation are we talking about?
Q. All the documentation that you've reviewed in this investigation.
A. That would be inaccurate.
Q. All of the documents in this investigation from Shoals other than its patent application and patent documents, you have not seen this input referred to as a drop line, right? Yes or no or correct?
A. I haven't seen it and I think it's irrelevant.
Q. And I think in your direct you said that Voltage refers to these as branches. You've seen that in their documentation, right?
A. What I've seen I believe is branches, and I think I've seen -- and certainly in their product code -- input. Same concept.
Q. Sure, I have too. We're on the same page in a lot of ways.
A. Great.
Q. I've seen, tell me if you agree, literature from both Shoals and Voltage and -- just reading about PV solar installations, these inputs can be referred to as branches, drops, leads, strings, taps, branches. You've heard and seen all of those, right?
A. All of those, you're right.
Q. But, differently, if you were at -- if you were

at an SPI conference every year, everyone is there from solar, and someone comes up to you and says something like, yeah, like, I saw someone has just, you know, just launched a ten tap Trunk Bus, ten taps, right? You would know that they mean ten inputs?

A. I would absolutely know that.

Q. And if they said ten branches, you would know what they're talking about, right?

A. Probably.

Q. Okay. And ten strings, same thing?

A. Maybe.

Q. Okay.

A. Those are all slightly different things and can be used for different purposes.

Q. Sure. Ten drops?

A. It's not a common use of the term in the field.

Q. Okay. Now if someone said ten drop lines, would you automatically assume that they meant ten separate inputs, or would you perhaps say, well, what actually do you mean by drop line? Because the term drop line for someone that's worked with electric codes and where words are very precise, right, sometimes those refer to the actual wire cable, right?

A. What is the question?

Q. Okay. Let me ask you this way. Have you heard

the term drop line used outside of the context of solar installations?

A. It is not a term of art in the field.

Q. When you say "field," are you saying in the solar field?

A. That's what we're talking about here.

Q. Okay. So you agree, the term drop line is not a term of art in the field of photovoltaic systems, right?

A. Not in my recollection.

Q. Right. And you've worked for three decades in solar installations, right?

A. More.

Q. You have very, very qualified credentials in solar installations. Okay. And in your experience drop line is not a term of art, right? I think you already agree with me, so I'll move on.

A. I agree. I don't know --

Q. Okay. Okay. Have you heard the term drop line used outside of solar, other --

A. Absolutely.

Q. Can you give us an example?

A. You can have a service drop line.

Q. Let's do one at a time.

When you say "service drop line," what are you referring to?

A. So coming off of a service transformer, if it's an overhead service, a service drop, you might call it a drop line in some cases.

Q. And in that instance, sir, is it referring to a wire or cable or something that's basically carrying electric current?

A. It is.

Q. Okay. Can you give me another example where you can think of drop line being used, you know, a term of art?

A. Get me a drop line, I got to plug into this extension cord. It's another term for an extension cord, I need a drop line.

Q. Again, in that context, drop line is the wire, the cable, the conductor that's carrying electric current, right?

A. It's typically small in that case.

Q. Can you think of, sir -- it's going to get a little tricky, so if you can't, tell me.

Can you think of an instance outside of solar where you have heard the term drop line and it is used to define the structure of a mold?

A. Not a used term.

Q. That's why this is patent law and you're the expert in solar installations, right?

A. That's why the words in the patent are rarely

used in the field, and that's true of most patents that I've ever seen.

Q. Understood. Agreed.

In photovoltaic -- sorry.

In the field of solar installations, the term "aperture" is not one that's commonly used, right?

A. No.

Q. You've probably, until this investigation, have never heard the term aperture used in the context of any solar installation or EBOS solution. You would agree, right?

A. I was going to answer no and then you changed the question to yes, and so I'm kind of confused.

Q. Let me try to ask it again.

In your experience, 30 years, working in solar, have you ever heard or seen the term aperture used in the context of an EBOS solution?

A. I can't recall it.

Q. It's an unusual term, but it's one that is in the patent, and we need to and the Court needs to look at the intrinsic record, the evidence, and figure out what the claims mean, right? That's part of our task?

A. Seems to be a contentious issue.

Q. Agreed. Now earlier Mr. Barquist asked you whether or not your understanding or your application of

aperture as it's used in the '153 patent is consistent with what a person of ordinary skill in the art would view it. Did you say that?

A. I don't believe that represents the record correctly. I don't remember that question.

Q. That's okay. Not trying to put words in your mouth. I'll come back to that.

So let me ask you about representative products. I believe in your expert report for Voltage you said that you looked at all of the different product samples that you received, many, and you cut open many, and you went through that during your direct, and you came to the conclusion that there were no meaningful differences in terms of the relevant structure.

A. Yes.

Q. Right? And that's because, in your opinion, so long as there is an input or tap or string, anything in this mold drop, however many inputs there are, there are the same number of apertures and each of them goes partially through the mold, right?

A. That is not correct.

Q. Can you give me, then, an example of a situation where you would have a mold or mold drop and you had an input where the aperture related to the input extended completely through the mold?

A. I understand your question. You're asking if an input -- when we talk about input, we're talking about the small wires here -- would have an aperture that would completely go through the mold.

Q. Yes.

A. And my answer to that is absolutely not.

Q. Absolutely not meaning --

A. Does not go completely through. It's partially through because it ends at the nexus.

Q. Right, right, so maybe you misunderstood my question or it was not framed well enough.

In your opinion, when you have an EBOS solution and you have multiple inputs going into --

Mr. Brooks, can we call what's inside here where all the current is flowing into a joint?

A. I think the marijuana community might --

Q. I just want to make sure we're on the same page.

A. A compression lug that Shoals calls the nexus, if you want to use compression lug, I think both products do that.

Q. Let's use "nexus." Nexus a term in the patent, but we all understand that the nexus is essentially what -- the area where all the current is flowing, right?

A. Yes.

Q. And there's no disagreement that in the context

of solar installations, EBOS solutions, Shoals' patent, Shoals' products, Voltage's products, all of that stuff, we're all talking about electric current that's being collected from the sun to solar panels collected through cables, wire harnesses, whatever you want to call them, all this stuff is coming together into various nexuses, right? That's part of the EBOS solution, nexus, nexus. We're on the same page, right?

A. Yes.

Q. So I'm going to refer to that as a nexus.

A. Okay.

Q. You would agree with me that your view of the '153 patent claims and the Markman order and your infringement positions and positions on domestic industry is that, so long as I have an input, any input that is one of the small wires, so not the big feeder cable, but all of the inputs, each one of those, for every input I have, I have an aperture, and that aperture necessarily extends only partially through the mold. It does not go all the way through the mold. That's your opinion, right?

A. That is my opinion.

Q. Okay. So, in other words, as an example, Voltage produced, I think it was 15 different Trunk Buses, physical samples, 15 different configurations, and then with a complete product and also one that only had the inner mold

on it.

Does that number sound about right? You've got a slide that lists all of them?

A. We need to call this a mold, not a Trunk Bus.

Q. Call it a mold.

A. Words mean everything.

Q. You're right. Voltage produced 15 physical samples of its mold or mold drop, okay?

A. Yeah.

Q. And the complete product as well as the one without the outer mold material, right?

A. Yes, in many cases. I can't say for every single one, whether we had, you know, incomplete and complete.

Q. Right. Okay. And so there is documentation that's been provided to you, like an Intertek Report that confirms that there are two layers of mold material in the product, right?

A. Yes.

Q. Okay. And so for purposes of determining whether or not the product has apertures that extend partially through the mold that are associated with, as the claim says, drop lines, there was no need to cut open all of these products, because they necessarily have apertures that only extend partially through, for each input, there is one aperture, and that aperture extends partially through all

the time no matter what, in your opinion, right?

A. Actually no.

Q. Okay. I thought you just agreed with me, but I'll give you a chance to explain since --

A. So, to explain, as I was cutting through these, I discovered one of the molds -- and this is one, one that didn't have a cover on it -- didn't have a nexus inside of it. It just had a wire passing through not collecting $200 or anything like that and not connected to the feeder, which was surprising.

And so I then took my multimeter out and tested the mold drops, because I had -- the molds that I had are the ones that I wasn't cutting open because I couldn't see inside to see all this, and I found another one in my sample that didn't have a nexus. So I cut that one open.

Q. I think you mentioned that in your deposition. I wasn't sure what you were referring to, but thank you for that explanation.

Did you say that you cut it open, or this was just based on your -- the test that you just did?

A. I can't a hundred percent recall, but I believe I cut it open, but I know I cut open obviously the first one that didn't have the overmold on it.

Q. I just want to know, sir, the sample that you're talking about where you say that when you cut it open there

actually wasn't a nexus, that wasn't discussed in your expert report and I haven't seen any photos of that here in this hearing this week. Are they here?

A. They're not.

Q. Okay. I'm not saying that that didn't happen. I'll take your word for it.

A. I was trying to answer the question accurately.

Q. Understood. Seems like, other than what may be some manufacturing tolerance error in that instance, you would agree that, otherwise, okay, every mold drop or mold in your opinion for each input there is necessarily one aperture associated with it, and that aperture necessarily only extends partially through the mold. It does not go completely through.

A. That is my opinion.

Q. Now, Mr. Brooks, for Voltage's products it is your opinion that you analyzed enough products to come to the conclusion that everything infringes, all of them infringe, that's your opinion, right?

A. I believe that was my testimony.

Q. And you also have the opinion that for Shoals' BLA products you believe that Shoals' -- strike that.

I don't want to put opinions in your mouth that you didn't make.

You've at least testified today that you believe

that the Shoals' BLA products that you've analyzed practice the '153 patent, right?

A. That is accurate.

Q. Okay. Mr. Barquist went through what you analyzed to arrive at those opinions. I want to ask you about one of the documents that we've looked at a few times.

Can we actually put up JX-0119, Mr. Brooks? That Mr. Brooks.

A. 119...

Q. Okay. Mr. Brooks, JX-0119 is Shoals' they called it a spec sheet for its BLA or Big Lead Assembly, true?

A. Yes. I don't know whether they call it a spec sheet, but that's often what it's called in the field.

Q. No problem. And you were asked by Mr. Barquist about this document during your direct, true?

A. I believe this is the document we discussed.

Q. Okay. And do you see on the top, would you agree that on the very top, the first image, if we can blow that up, right there, so at the top would you agree with me that you see six BLA mold drops, three of each are on -- three on a cable and then three on a cable below it?

A. I would agree with that.

Q. Okay. Great. Now let's talk about the one on the top, okay?

You'd agree with me that, first, just by looking

at what's on this picture, you don't know whether or not what we're seeing are positive or negative BLA harnesses, right? There's not enough information from this picture to come to that conclusion, right?

A. Actually there is now that I look at it. And this has to do with the configuration of the connector.

Having seen a million of these things, I can tell you that the connectors along the top BLA example are positive, because they are receiving the positive connector from the array.

And it's a weird thing. These are mating connectors. So in order to receive a positive connector, you have to have a negative connector. We won't go into male and female.

And then on the other side, those would be the connectors that you would use on the negative side. So I would say that, from the evidence that I see here, the top one is intended to be positive; the bottom one is intended to be negative.

Q. Okay. Just so to make sure I've got it right, the top one is positive, and that is because the connectors -- the photovoltaic connectors that are coming out of the branch cables that are pointing upwards, those are -- are those male or female?

A. I don't want to go into all that.

Q. Okay. We'll just say -- how would you like to characterize it so that we know we're talking about the same thing?

A. So this connector right here that I'm holding in my hand, this is from CPX-0036, has a little plus sign on it, and that is the connector that would be connected to the plus side of a module, okay.

Q. Okay.

A. And that's why it's identified that way. And you can see that that is what would plug into the one, which I don't think I have here, which is the other side connector, which would have a negative sign on it, but negative/positive is not the issue.

Q. Understood. Understood. We know enough at least that, looking at this figure, based on the different photovoltaic connectors, you as someone that's very experienced in solar installations can basically see where is this going to fit within a solar installation in addition to which way the current is going to flow. Is that accurate? There could be inputs and outputs?

A. We'll say where the power is going to flow.

Q. Okay. So can you describe for me as well as the ALJ, when you look at -- you've got a positive and negative or however you want to frame it, which way is the power flowing in the two pictures that are on the screen JX-119.1

at the top?

A. I guess I'll use this one here.

Q. Please.

A. So the power on this one is coming into the inputs and going to the left, and since this is the end of the reel -- again, these are all just hypotheticals, because they're going to be -- they could be 150 feet apart, as we saw earlier -- that's going to -- that side would probably be connected to the disconnect, and the solar would be coming in and going this a way toward us.

Q. Just so that we're clear, power is flowing to the left on the top one?

A. Sure.

Q. So there is on the right-hand side the BLA mold drop -- there's no big cable coming out of the end, right?

A. That's correct. That appears to signify the end of the drop in this case. I'm sorry. The end of the BLA, Big Lead Assembly, sorry.

Q. And then the current, I think you said, at the top, it's flowing into each of those BLA mold drops and then ultimately -- I'm sorry -- power is flowing into each of those mold drops and then going down the big cable.

A. Yeah. An easier way to say is it's collecting, it's collecting it from the solar panels. The solar panels collect the sunlight. The power from those panels is

collected into these small wires that goes to bigger wires. You can say they are tributaries, whatever. They are working their way to small to big.

Q. Thank you, Mr. Brooks. You are refining my terminology as we go.

A. Happy to help.

Q. So the top one, the power is being collected by each of those BLA mold drops and being collected and flowing down the large cable, right?

A. (Nodding head up and down.)

Q. And then the bottom BLA assembly that has three mold drops, maybe with some other things that aren't shown, can you describe how the power is flowing in the bottom BLA assembly on JX-119.1?

A. Basically, these are the ends of the wires. So they would be just like those right there. It's coming at us, if you would.

Q. Okay. And so what's happening, Mr. Brooks? What is happening on the bottom one in terms of power?

A. So if you look at this right here is just like this right here, and this right here is like this, and it's showing it coming off a reel.

Again, this is an artist's depiction, and it's just trying to help people visualize, they have never seen this stuff before, like what the heck are you talking about.

Q. Right. And so in the way that you were describing what happens with the BLA assembly on top where the power is being collected into each mold drop and then it's going along the cable going to the left, can you describe for me and the ALJ what is happening with the BLA assembly on the bottom? What's happening with that one?

A. Again, these are artist's renditions. I think -- you know, they're not intended to show current flow, but I'm saying that the current or the power flow like this one is going this way, this one is going that way. That's just the same thing. This is not complicated. It's just...

Q. Right. I guess what I'm having trouble understanding is you keep pointing to me what's happening on the top one, but what I'm asking you is what's happening on the bottom. It doesn't seem like you're answering my question, but maybe I'm not understanding.

A. You're speaking "lawyer"; I'm speaking "engineer." I've seen this stuff. I don't know what you need. This is a reel where this is -- what they do is they actually pull this off the reel and it's already -- it's wound up on the reel and they lay it out. So they start at the disconnect and they lay it out down the middle of the row.

Q. What's happening to the power in that bottom cable?

A. It's coming toward this end, this end being terminated either in a disconnect or an inverter. I don't know how else to tell you that.

Q. Okay. But can you use -- can you use the illustrations? I'm sorry. Maybe we're getting -- can you only blow up the big picture on the top? Yes, there we go.

A. Brooksie. I'm sorry.

Q. I might have caused the confusion, Mr. Brooks. So let's start over.

A. Okay.

Q. On the screen you would agree with me that, on the top, I have a big cable and it has three BLA mold drops, right?

A. It certainly appears to.

Q. Right. And each of the mold drops has four inputs, right?

A. I'll agree with you.

Q. And then assuming that this is connected into a solar installation the way you would expect, I think you said that the power would be collected, meaning current -- power would be collected from the solar panels, it would go into each of the mold drops, and then it also continued to collect as you go down the big cable; is that right?

A. If we had more mold drops to the left, which would be common, it would be the way it is. It would keep

collecting and collecting until it reached the maximum number of inputs for that feeder. It's all about the maximum number of inputs.

Q. Understood. Meaning, for example, the amount of power that is collected, once you get past these three mold drops, it's going to be more than the amount of power that is on the cable, let's say, once you get past the first one, right?

A. It gets more and more and more.

Q. You can think of it as three streams flowing into a river, right? When you get farther down the river, you've got more water flowing through. Is that --

A. Starting to learn, yeah, that's great.

Q. Now what is happening, then, with the bottom BLA assembly? Assuming that it is connected in a solar installation in the way that you would expect one as someone with your experience.

A. It's part of a circuit. Unless you see the whole thing, this is very hypothetical, and for an engineer, this is easy and plain. For anybody else who doesn't deal with this every day, this is -- these are -- these are circuits.

Q. Okay.

A. Okay? And so you have -- these are strings often or harnesses, we've talked about both, and they are going out to -- let's use the string analogy -- it's going out to,

say, 25 or 30 PV modules and series, plus minus, plus minus, all the way around, and comes back around into here and creates a circuit.

And so these two -- that's why they are sold in pairs. You got to have both. It's not magic. It's actually electricity. And it's DC electricity. And so it completes the path.

And so to explain that, this guy and this guy are friends. They are part of the same circuit. This guy and this guy are friends and so -- because they are part of the same circuit. And then they have all become one happy family in the feeder.

Q. Right. And as part of that circuit -- correct me if I'm wrong; you're the expert -- that circuit, it goes in a loop, right?

A. That's why we call it a circuit.

Q. Okay. Great. So if we think about power or whatever you want to analogize it as inputting into here and being collected, is it fair to say that when it comes around this way along this big cable it's now being distributed or outputted or some other term?

A. No.

Q. Okay. Then what's happening down here?

A. That's why I use the term "power flow." Because if you start talking about current, we can get really tied

up in knots about which way electrons are flowing, which is opposite of current. And I know we have a few electrical engineers in the room, but we're not going there.

Q. I'm not one so --

A. Okay. And so we're just talking background circuits. And it's always in. Power in -- always. It's not out. Sorry.

Q. That's okay. That's helpful.

So you would agree, then, that following the flow of power to determine what is the pathway within a mold structure, that may not be the right way to look at how to define a structure in a patent claim that's supposed to be covering something like this?

A. I don't see how that's relevant.

Q. Sir, you do agree, though, that for this BLA mold drop on the right, on the right-hand side, that from this picture you can't tell whether or not this feeder cable is going all the way through the mold that's inside here, right?

A. I don't see how that's relevant either. It can't go all the way through, because, if it did, it would be electrically conductive on the outside and you could hurt somebody.

Q. Okay. So if we were analyzing this BLA mold drop right here on the right-hand side of CX-119, you would --

it's your opinion that this would be a mold structure that does not have a feeder cable that extends all the way through, right?

A. I would say that that is not necessary for the patent and that -- it's still a BLA. A BLA is a BLA. And the one on the end is going to have a cap on it every single time, and that does not affect the claim structure whatsoever.

Q. It sounds like that's probably maybe what your lawyers told you. You're not providing that opinion, though, because you're not a patent lawyer, right?

A. That issue has never come up in discussions, sir, and, therefore, I'm just telling you how it is.

Q. Agreed. No problem.

And so I just want to confirm, then, that, for purposes of your analysis in this investigation, to determine whether or not there is infringement by Voltage or technical domestic industry, you did not look at a mold structure such as the mold drop that's on the right-hand side here where the big cable is not going all the way through. You didn't look at a structure like this, yes or no?

A. It's not relevant.

Q. And so -- but you didn't look at a structure like that, right?

A. There's no point.

Q. I know that you say that there's no point, but do you remember in your deposition I asked you about whether or not you had talked to another expert from Shoals, an economist, Mr. Nelson?

A. I vaguely recall a question relating to that.

Q. Have you had a chance to meet Mr. Nelson during this week as you're preparing for the hearing?

A. I haven't had conversations with him.

Q. Okay. We're now several more months removed from when I asked you about it in your deposition, but would you agree with me that you and Mr. Nelson did not discuss the specific mold BLA structure I just talked about, which is one that would represent what's on the right-hand side of JX-119, this BLA mold drop that's at the end where the big cable does not go all the way through?

You guys did not talk about this structure and whether or not -- whether or not that specific mold drop practices or does not practice any claim of the '153 patent. You agree, right, that did not happen?

A. My explanation earlier about the fact that this is a mold drop and not a BLA and that this patent is about the BLA means that we're concerned about whether the BLA practices the patent. And that mold drop in a single-drop mold drop do not affect whether it practices the patent in

any way, shape or form, because it's still a Big Lead Assembly -- assembly meaning many, not just this one.

Q. Let me frame it slightly different for you, then. I think I understand the argument that you're trying to make or support.

A. It's clear. Clear.

Q. When you are looking to determine whether or not a Big Lead Assembly meets a claim of the '153 patent, you would not go and look at this end mold drop, right? You wouldn't look at it. You would say I don't need to look at that one, I can look at this one or this one, the second one or the third one, I don't need to look at the one on the end, right?

A. That is my opinion.

Q. You would agree with me, though, that -- let's say that you did need to consider whether or not the end mold drop, okay. If you did, you didn't do that in your analysis, right?

A. It's a hypothetical, sir. And that's why I said the use of language is so critical. I work with standards all the time. I know it's a different field. But this is not a BLA. It is a mold drop. And a BLA is an assembly that includes all kinds of things. And we could literally have a BLA that was a mile long that had three thousand single drops on it, and that end drop on it, if it had a

single two-drop mold on it, it meets the requirement of the patent. That's clear. And anyone in my field, any engineer worth their salt, would see it the same way.

Q. Okay. Appreciate that explanation.

Mr. Brooks, during your direct Mr. Barquist had asked you a question about whether or not an inner mold material fully encases the nexus, and there is a moment where you paused for a second. I think you said something like, something to the effect of, you know, because you're an engineer -- do you remember that, when that happened?

A. I remember vaguely, yeah.

Q. Okay. And it caught my attention. I was curious.

Did you pause because, as an engineer, normally if you are asked does a material substantially seal or seal something else that you would want to do some testing but you hadn't in this investigation to answer that question? That's why you paused, right?

A. I would say that just simply looking at a picture, not having handled it myself and having worked with all those different versions of it, that if I -- if somebody just put that picture in front of me, that I would not be able to make that determination.

Q. I understand. You're an engineer by trade, right? You're an expert. And when Mr. Barquist asked you

whether or not something in a picture fully encases or seals something or substantially seals something and all you've done is looked at the picture, right, kind of hard? Understand this is a patent case, but that's why you had some pause, right, sir? Do you agree? Yes?

A. I'll give you a yes.

Q. Thank you. And so you would agree that, if you had the opportunity to take the sample, run some tests, do what an engineer normally would do in this situation, you could determine whether or not a material was actually sealing the material inside or substantially sealing the material inside, or if, for example, something else in the product was doing the sealing function, right?

A. I believe that what we're talking about is looking -- we're looking at it right here. So this is the final product. We were talking about a cut product in that example. This is a final product.

I can say without any hesitation, zero hesitation, that this product is intended to fully encase the nexus. And even though it was off-base before, you've opened the door for me to say this would be the primary mold.

You've opened the door, sir. And if there was nothing on that nexus, this mold could absolutely seal the nexus regardless of what you did inside there.

Q. That's not based on any testing that you did, sir, right?

A. It is absolutely based on the Intertek testing that requires rigorous testing of this to make sure that this package does not leak current. That is its entire reason for existence. So I can do that without any hesitation whatsoever.

Q. I appreciate the explanation. Thank you.

That product is UL certified, right?

A. It is certified by ETL, I believe. That's different. Every -- the certification mark is the mark -- well, it was an Intertek Report, so Intertek ETL, Edison Testing Laboratories, Intertek.

Q. Mr. Brooks, you were here -- you've been here in this courtroom the whole week, right? There hasn't been a witness that you haven't seen testify?

A. Just like a bad comedian.

Q. Earlier this morning and as well as yesterday there was a lot of questions of witnesses about wire harnesses and whether or not Shoals' BLA or BLA mold drop is a wire harness, right? You heard those questions?

A. I heard lots of those questions.

Q. You've been working in solar three decades, is it?

A. Thirty-six years.

Q. And I think you said that you used to work also for First Solar, right?

A. They were a client.

Q. They were a client of yours. And that goes all the way back to Mr. Solon's invention story of how he got involved in the solar business, right?

A. I go way before him.

Q. Even way before him, okay.

You would agree that wire harnesses, wire harnesses were used in other industries before they were used in solar, right?

A. The term "wire harness" comes from the automotive industry. And Dean Solon, having come from the automotive industry, brought that term to the solar industry. To my knowledge, nobody had ever used that term prior to Dean. He is the one that coined the term in the solar industry.

Q. Okay. Wire harness, that's a term that had been used in automotive and other industries, right?

A. Extremely generic term.

Q. Agreed, because it's basically just taking power from two conductors and combining them into one or some variation of that, right?

A. No, it's not actually.

Q. Explain.

A. Okay. I work on cars a lot. And cars have wire

harnesses all over them. That's why the automotive term. And there could be multiple computers in the car, and they have wire harnesses for each one. And they're not for combining whatsoever. They're for controlling for doing all kinds of things.

So wire harnesses is such a broad term that, if you're going to use it in a situation, context is everything. You have to determine what kind of wire harness you're talking about. And the idea of using a wire harness to combine power, can't recall anybody before Dean that did that.

Q. In any application anywhere.

A. I can't recall.

Q. In your opinion, though, that is something -- let's set aside whether someone had done it before in another application, right. Mr. Solon used wire harnesses to reduce the number of home-run cables in a solar installation and reduce the size of the combiner box, right? We've heard that from several people this week, right?

A. That's the generic term that was associated with that device that he developed.

Q. Right. And when you were working -- when First Solar was a client of yours, were you familiar with that wire harness solution that Shoals was offering to First Solar and others in the industry?

A. Yes, I was.

Q. And you would agree that that solution was taking the power generated from two or more arrays, solar arrays, and then combining it together into another conductor so that that combining didn't have to happen at the combiner box, right?

A. So Dean, as he said in his testimony, was addressing a very specific problem that First Solar had. They had very low current, high-voltage modules, that were unique. Cadmium telluride, look it up. Cadmium telluride modules had no current, and, therefore, using the same size conductors we were using for products that had ten times the current was not economical.

And so, as First Solar began to really increase their influence in the number of projects they were doing, they needed a solution. And so they turned to Dean who they had already been working with, and so they came up with --

Again, whether you call it 20 amps, now I can take 20 branches, keep them a lot shorter, and dump them into the same wire, all the same size. Back then all the branches I saw, all those wire harnesses we're talking about, were identical size conductors, or they might -- they might have gone down to 14 gauge and up to 10 gauge. It was not very often. They were just bringing the vast numbers of strings of cadmium telluride modules to the combiner box so

they didn't have to do much larger combiner boxes. It was a great solution.

Q. And as a result of that solution, the power from the solar panels would get combined in another conductor instead of at the combiner box, yes or no, sir?

A. They were bringing the --

Q. Yes or no, sir? Yes?

A. Yes.

Q. Great. And the BLA, the Big Lead Assembly, also takes the power from solar panels that's collected and then combines it into a larger conductor so that it does not have to be combined at a combiner box, yes or no, sir?

A. No. Because you just took two things. You took the same size conductor and then a bigger conductor.

Q. Mr. Brooks, please, so when I ask you yes or no, I'd appreciate -- in many instances I've let you explain, but we also have a limited amount of time. If Mr. Barquist thinks it's necessary to have you explain more, you've seen he will get the opportunity to ask. Okay?

A. I do not agree with that question.

Q. Mr. Brooks, can you see that?

A. I can.

Q. This is from your slides. I don't have an updated copy.

A. It looks --

Q. Mr. Brooks, this is a slide from your direct testimony, right?

A. It certainly looks like one.

Q. And Mr. Barquist asked you about this. We can zoom out a little bit.

This is a slide where he was asking you about your opinion that the Shoals' BLA that you looked at that it meets the second aperture extending partially through limitation of claim 1, right, sir?

A. I recall that we were -- in the many times we talked about this, this appears to be correct.

Q. Okay. Now I want to ask -- I want to make sure that we have a very clear record as to what is your opinion and the reason for it.

So correct me if I'm wrong, in your opinion, in this mold drop, the BLA mold drop of Shoals that was cut open, you believe that there are four inputs, right?

A. Four inputs, drop lines.

Q. So there's four inputs, and you have called them, for purposes of the patent claim, you've called them four-drop lines, right?

A. It's in the Markman order too so we need to be careful.

Q. I'm not going to fight you on that. We can agree those are four-drop lines that you are calling also inputs,

right?

A. Yes.

Q. We can call them branches, strings, taps. We're all talking about the same thing.

A. Same thing.

Q. You agree, though, also, that those four inputs are made of two copper cables, right, made from two copper cables?

A. From this picture I can't say.

Q. Ah. You can't tell from looking at this because you don't know if each of those inputs is actually formed by a separate copper wire, right?

A. You could have it cut in the middle or choose to use the same piece of wire. It doesn't change the fact that a single wire could create two inputs, I think that's in the Markman order several times, I think we saw it earlier today, and you could use two separate wires. It's just a manufacturing issue.

Q. Okay. Fair. I understand your opinion.

As long as there is an input, you have an aperture that extends partially through, and so because there are four inputs, as you would call it, four drop lines, doesn't matter if it's two or four cables forming that, you have four apertures extending only partially through, right?

A. There would be four separate apertures for the four separate drop lines in this picture.

Q. Okay. So let's talk about the one that you focused on for this claim and this slide.

In your opinion, the drop line on the left that's associated with that second aperture comes into the mold drop, right?

A. It says the drop line extends from the aperture.

Q. Okay. I think Mr. Barquist asked you, though, does the drop line go into the mold and then into the nexus?

A. When we talk about an input, that would be the way we're talking about the flow of power that you were getting at earlier. In this particular construction in the claim, it says the drop line extends from in this particular claim. The other claim talks about going into. We can look at both of them side by side.

Q. I think I understand. You're saying that, in terms of the flow of power, the power along the drop line is going away and out from the BLA mold extending from and out of the structure, right?

A. The cable that makes -- the portion of the cable that makes up the drop line, according to this, okay, as we're coming out of the nexus where it did its job, okay, that's the whole reason for the existence of the nexus.

We mentioned the fact that, if you don't have a

nexus, we got a problem, and then comes, in this particular construction, we can trace that drop line, not talking about power flow, trace that drop line going from the nexus out through the undermold.

And then, of course, if there's an overmold, got to go out through that overmold. And there is -- it's like a tunnel. We've called it a pathway in these discussions.

MR. OU: Your Honor, may I approach and hand him this demonstrative?

JUDGE BHATTACHARYYA: Yes.

MR. OU: Thank you.

Q. Let me hand this to you because I think it's easier probably for you to annotate it and then we can show the Court.

A. All right.

Q. So let's first identify the report so we have a clean record.

I've handed you CDX-5C.125 for the record. It has a different number on the slide. We can confirm that later.

This is -- I've handed you one slide from your presentation, right, sir?

A. Sure looks like it.

Q. And it's the one that addresses Shoals' BLA mold drop for the second aperture extending partially through,

right, limitation?

A. Yes.

Q. Okay. So, first, can you mark for me where on the picture the aperture, the second aperture, begins? And maybe put a 1.

A. The second aperture extending partially through the undermold. It doesn't say where it starts and ends. I don't see that here. Do you see that?

Q. Do you have an opinion sitting here today where the second aperture starts?

A. I think it's completely irrelevant.

Q. So you don't have an opinion, sir?

A. It says through the undermold. It talks about the drop line. It's discussing the drop line. The actual aperture is the aperture. It's formed by the drop line.

Q. So --

A. In our other --

Q. You did not -- let me -- I understand you don't -- let me just make clear for the record, as it relates to the second aperture, on the demonstrative that you have, you don't have an opinion as to where the second aperture begins, right?

A. For this particular claim, I don't -- I'm reading it. I don't see that start and end of aperture is discussed. It appears that the drop line is discussed and

the longitudinal axis is discussed. Words mean everything. So I'm not going to -- there's no reason to do a hypothetical on which is which.

Q. Okay. So just to confirm, you do not have an opinion as to where the second aperture in the Shoals' four-drop mold drop BLA, where the second aperture begins, yes or no, sir?

A. I believe in my testimony, in my deposition -- trying to think back, that was quite a while ago when we chatted -- we talked about the aperture. I can't recall where it starts. I don't think I remember having that conversation related to this, and I just don't see how it's related. I think we're --

Q. Yes or no, sir? Yes or no? Today you do not have an opinion, you cannot tell me, you cannot tell the ALJ, where you believe the aperture, the second aperture, in the Shoals mold drop that you're looking at starts, yes or no, sir?

A. It could be either direction. I could say we can start it --

Q. Yes or no, sir?

A. It could be both.

Q. It can be both.

A. It could be both.

Q. Next question. In that same demonstrative,

Shoals' BLA mold drop, do you have an opinion, yes or no, sir, as to where the second aperture ends? Yes or no?

A. As I said, if it starts at the nexus, it ends, for this part of it, at the -- we're talking about the undermold. It ends at the edge of the undermold. If it starts at the edge of the undermold, it goes to the nexus.

Now a better way to think about this would be to it starts at the nexus, goes through the undermold, goes through the outer mold so it can receive the drop line.

Everybody is worried about this aperture thing. They are way complicating this thing. It is the space, and this is even said in the Markman order, that is displaced by the drop line coming in and doing its job getting to the nexus. It does not go out the other side regardless of what the wire does.

And I absolutely do not believe that the wire test is the proper test for this. That makes no sense.

Q. Sir, again, yes or no, let's confirm, you do not have a -- you do not have an opinion as to where in the mold structure the second aperture begins or ends.

A. If --

Q. You want --

(Clarification requested by the court reporter.)

Q. Please.

A. I will draw what I think we had in our previous

slide deck --

Q. Sir, let me ask you a question. I'll get another demonstrative.

JUDGE BHATTACHARYYA: Mr. Ou, we'll need to conclude fairly soon. I'm fine with you completing this line of questioning, if that is what you want to do.

MR. OU: Yes, Your Honor. I knew we were close on time. I'm happy also to end now, that's fine.

JUDGE BHATTACHARYYA: Another five minutes is fine.

Q. Mr. Brooks, focusing back on we were talking about the second aperture of the claim. And I just want to know, sir, yes or no, can you pinpoint a location? I'll ask you to draw a circle around the point in the mold structure that you believe the second aperture begins. Can you do that? Yes or no? Yes or no?

A. The question --

Q. Yes or no, sir?

A. The question doesn't make sense. It just doesn't make sense. We're talking about a void. Where does it start; where does it end. It's got a diameter. It's got a longitudinal axis.

It is -- it is forming the pathway that the wire is going through. Starting and ending from an engineering mind makes absolutely no sense to me. So it's a non

sequitur. Can't get it.

Q. So the answer is no, right? You cannot identify a place, if I asked you to circle where does the second aperture within the mold structure start, you cannot identify it for us, correct?

MR. BARQUIST: Objection, asked and answered, Your Honor.

A. I've answered it. I'm not going to give you a yes or no because it doesn't make sense.

JUDGE BHATTACHARYYA: The objection is overruled.

A. Your question does not make logical sense, and I don't know where you're going with this. It just -- I don't understand it.

Q. Okay. Now talking still about the mold structure of the four-drop BLA. If I asked you to circle where the second aperture ends, a place within the mold structure, can you do that? Yes or no?

A. I will draw a picture of the aperture, and we'll not talk about starting or ending. Those terms, start and end, make no sense, okay? It is a 3D thing. In the Markman order it says that.

If you take the drop line out -- line, not lines -- drop line, there is no S, it's a big deal -- if there is an S, then we can talk about the wire test. But in the case I will draw for you, not the start and the end, I

will draw you the extent of a 3D opening, and that, sir, is what we're talking about. And trying to pin down where it starts and where it ends, I can show you the extent of it.

You can pick an end, where it starts and ends. We're talking about -- in this case we're talking about this particular mold structure, and this one actually proceeds all the way through the undermold through the outer mold, okay.

So I've drawn for you with my Sharpie and my highlighter, for the record, I have done that, and I can show that to the -- so I put that on there for you to show you the extent of that pathway.

And to try to pin it down with some semantics is -- I don't know where you're going with it, but it just -- I'm not going to be trapped by some game that a lawyer would play on this to say, well, you said this. That's it.

MR. OU: Your Honor, I'm clearly not done with my cross-examination, but I know that I don't want to keep people past the time, so if that's okay with Your Honor, we'll pick up in the morning?

JUDGE BHATTACHARYYA: That sounds good. I believe we're starting early tomorrow morning at 9:00. I'll see everyone then.

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(Whereupon, the hearing recessed at 5:38 p.m. scheduled to reconvene the following day, March 20, 2024 at 9:00 a.m.)

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS	STAFF
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EXHIBITS SUBMITTED FOR ADMISSION:

Complainant

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CX-0115

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CPX-0036

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Staff

SDX-0001C

C E R T I F I C A T E

TITLE: IN THE MATTER OF CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1365

HEARING DATE: March 19, 2024

LOCATION: Courtroom B

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: March 19, 2024

Signed:

ss// _____

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// _____

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// _____

UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

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OPEN SESSIONS

Pages: 538 through 719 (with excerpts)

Place: Washington, D.C.

Date: March 20, 2024

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

----------x

International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Wednesday, March 20, 2024

Volume III

The parties met pursuant to notice of the Administrative Law Judge at 9:00 a.m. Eastern.

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Supervisory Attorney

*** Index appears at end of transcript ***

P R O C E E D I N G S

(In session at 9:00 a.m.)

JUDGE BHATTACHARYYA: Good morning. Please be seated.

Are there any housekeeping matters to discuss before we continue with our witness?

MR. BARQUIST: Nothing for Shoals, Your Honor.

MR. COYLE: Nothing for Voltage, Your Honor.

JUDGE BHATTACHARYYA: Very well.

MR. SHIN: Your Honor, the Staff just wants to acknowledge that we sent the chambers an email updating the schedule, and at some point maybe -- we did indicate that it looks like the parties would like to go over into Friday. So if that's a concern, or if you have any additional guidance for us, we can take that up later on.

JUDGE BHATTACHARYYA: Okay. I saw that email, and that's fine if the parties want to go into Friday.

MR. COYLE: I apologize, Your Honor. Our realtime doesn't seem to be scrolling.

(Interruption in the hearing due to technical difficulties.)

JUDGE BHATTACHARYYA: Shall we bring Mr. Brooks back to the stand?

WILLIAM BROOKS,

having been previously duly sworn or affirmed

on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: We're on the public record.

CROSS-EXAMINATION (continued)

BY MR. OU:

Q. Good morning, Mr. Brooks.

A. Good morning, counselor.

Good morning, Your Honor.

Q. Do you understand you're still under oath, sir? Do you understand you are still under oath, sir?

A. Yes, sir. It is hard to hear all of a sudden so... you were clear yesterday.

Q. I will try to speak up.

A. Thank you.

Q. We ended yesterday with a demonstrative, and you had expressed some concerns about semantics and lawyer word traps. There's not going to be any word traps today, sir, okay, to make that clear.

As you said yesterday, precision with words is important, you agree, right?

A. (Nodding head up and down.)

Q. You agree?

A. Yes.

Q. And I think I better understand your testimony and opinions now, so indulge me, okay.

At the end of your testimony yesterday you were willing to trace what you believed is the entire pathway of the second aperture through the undermold in Shoals' BLA quad-mold drop that you analyzed as part of your direct testimony, right? You were willing to trace the entire pathway, right?

A. Yes.

Q. But you were reluctant to say on which end of that entire pathway the aperture started or ended, because, in your opinion, you could view it both ways.

Did I get that right?

A. I can agree with that.

Q. So I just want to make sure we're on the same page, because I'm going to ask a few follow-up questions about your opinions, because I want to make sure that I fully understand your opinions, Mr. Shin fully understands your opinions, and, of course, the ALJ understands your opinions.

Is that fair?

A. That's fair.

Q. Do you remember yesterday there were a few instances where I was trying to ask you a yes/no answer and had asked the ALJ for an instruction?

Your counsel is going to have an opportunity to ask you on redirect, if he thinks it's necessary. If

there's a question that you don't think you can answer yes or no and you want to just tell me, I'll try to work with you. What's important, though, is I can't have you giving a long explanation when it's a simple answer. That will be for redirect.

A. Understood.

Q. Is that fair? Good.

Since last night, if you've had a chance to think over the testimony that you gave yesterday, is there any testimony that you gave that you think you need to correct on the record now?

A. Not to my knowledge.

Q. Can we pull up RDX-11C.1?

So, Mr. Brooks, after yesterday's examination, Mr. Barquist suggested that maybe we use some of the demonstratives that we had previously -- you guys had previously prepared. Just to make sure that we're all understanding what your opinions --

JUDGE BHATTACHARYYA: Is there an issue?

MR. SHIN: We're still on the public record.

MR. OU: Oh, this is okay.

Q. Mr. Brooks, on this slide, is it correct that you can see what you have identified in your -- what you identified in your direct examination as the second and third -- the second aperture on the left side and then the

third aperture on the right side, right?

A. Yes.

Q. Okay. And is it right that you were attempting to trace, trace out the second and third apertures in each of those pictures?

A. A two-dimensional representation of a three-dimensional thing.

Q. Right. And is the green line supposed to represent the access at which the second drop line on the right-hand side and the first drop line on the left-hand side, that they extend; is that right?

A. Yes.

Q. And so in your opinion the second and third apertures, they end as they're going in the direction towards the nexus. They end right at the nexus, right?

A. We're talking about the aperture through the undermold, so since there's no undermolding inside the nexus at this point, other than anything that would squeeze its way in, there's no intentional undermold there, then that would be in this case the end.

Q. So I just want to make sure it's your opinion that the second and third aperture end at the nexus.

The second apertures do not extend into the nexus, yes or no?

A. That is my opinion.

Q. And I think you just said that's because the undermold, the structure of the undermold, it does not -- there's no apertures in that undermold, right?

A. I would not agree with that. So you missed -- did you ask the question wrong? I'm sorry.

Q. Let me ask -- let me revise my question.

The drop line, let's talk about the first drop line. Your opinion with respect to the first drop line, that's the first input on the left-hand side, that it ends inside the nexus; is that right? Yes or no?

A. Yes.

Q. And, sir, this is just a yes or no question, do you have an opinion as to where inside the nexus the first drop line ends?

A. Do I have an opinion?

Q. Yeah. I just want to know if you have an opinion, meaning, if I gave you a pen and I gave you this demonstrative, would you be able to mark where inside the nexus you believe the first drop line ends? Yes or no?

A. I don't think it's -- an opinion on that, I don't think is relevant, sorry. So the answer would be I have -- I can -- we can chat about electrically conductive materials, but --

Q. So you have an opinion, right, sir?

A. I have an opinion, yes.

Q. You have an opinion, but you do not believe it is relevant where inside the nexus the first drop line ends for purposes of evaluating claim 1 of the '153 patent; is that fair?

A. That's fair.

MR. OU: Your Honor, may I approach the witness to hand him a demonstrative?

JUDGE BHATTACHARYYA: Yes.

Q. Let's go to RDX-0011C.002.

Mr. Brooks, that is just your slide, but now it's just the slide with the first drop line, right, that's highlighted?

Now, Mr. Brooks, can you on the demonstrative mark for the record, since you do have an opinion, where it is inside the nexus that you believe the first drop line ends?

A. (Marking).

Q. Can I see it?

JUDGE BHATTACHARYYA: Do we have an ELMO?

MR. OU: Sure.

Q. So, Mr. Brooks, in response to my question as to where the first drop line ends inside the nexus, it appears that you've marked with a blue line effectively a line all the way across the nexus.

Is that -- am I understanding your testimony

correctly or your marking?

A. No.

Q. Is it your opinion that there's a specific point somewhere within the nexus that the first drop line ends?

A. No.

Q. Now, Mr. Brooks, I want to hand you the other demonstrative, which is your slide that has the second drop line and the third aperture.

Your Honor, may I approach?

JUDGE BHATTACHARYYA: Yes.

MR. OU: Apologize. For the record, this is RDX-0011C, the last one was .002.

Q. Mr. Brooks you now have RDX-0011C.

That demonstrative has your direct slides, and we're looking at the second drop line and the third aperture, yes? It's shown on the demonstrative, right, sir?

A. Yes.

Q. And so my question, with respect to the second drop line, do you have an opinion as to where the second drop line ends within the nexus, yes or no?

A. Yes.

Q. And can you draw on the demonstrative where within the nexus you believe the second drop line ends? You're able to do that?

A. (Marking.)

Q. Thank you.

Your Honor, may I approach?

JUDGE BHATTACHARYYA: Yes.

Q. So, for the record, on RDX-0011C.3, is it correct, Mr. Brooks, that you drew a blue line effectively across the nexus --

A. No.

Q. -- on the demonstrative?

A. No.

Q. Is there a specific point within the nexus that you identified as to where, in your opinion, the second drop line ends? Yes or no?

A. No.

Q. So someone looking at your demonstrative would not be able to determine where you believe the second or the first drop line ends; is that right?

A. Possibly not. That sounds hypothetical.

Q. Now yesterday, during your direct testimony, you also said that the first, I'm sorry, you said the second aperture and outside the nexus, the aperture doesn't go into the nexus, because at the nexus there is no aperture where the undermold is surrounding the drop line.

Do you remember saying that in your direct?

A. I do.

Q. And can you explain what you meant by the nexus,

at the nexus there is no aperture where the undermold surrounds the drop line?

A. Yes.

Q. Please.

A. Okay. Thank you.

At this point, as I said many times yesterday, the drop line, whether there's one or more, becomes one with the nexus, and the undermold surrounds the nexus at that point.

The apertures that we're speaking about for the drop, each drop line, are apertures through the undermold or through the overmold in the '153 patent. And so, therefore, there is no aperture inside the nexus, because the wires are enclosed in a very cramped condition of this compression lug, which they are not laying in there as some people have assumed in some of the depositions.

These are very heavily clamped together with mechanical force. And there may be microns of inner mold that might get in that space, but there's certainly no intention, because if you get much inner mold in that space, then you lose your electrical connection, and that would be -- that would not -- this product would essentially fail.

The entire purpose of the drop line is to bring solar power through these molds, through those apertures of the molds, into the nexus, and make electrical connection at

the nexus to the feeder cable. And at the feeder cable there is a compression lug.

Q. Thank you, Mr. Brooks, for that explanation.

One second.

MR. OU: Your Honor, may I approach?

JUDGE BHATTACHARYYA: Yes.

Q. For the record, right now we'll just say that's RDX-13.

Mr. Brooks, that's, again, your -- from your direct examination. I gave you one of your slides that shows the same cross-section, but it doesn't have any annotations on it, right?

A. Yes.

Q. Now can you draw on the demonstrative where the drop line, as it enters the undermold, draw a line, and then go all the way to the point where you believe that the drop line ends, the first drop line?

A. The first drop.

Q. So the first drop, you would agree, let's call that the one on the left, right, it's going to -- the first drop line is going to come into the undermold and then it's going to eventually terminate in the nexus. You would agree, right?

A. Yes.

Q. So can you please, for the record, on the

demonstrative, draw a line that follows the path of the drop line until the point where the drop line terminates in the nexus?

A. I think I understand what you're saying. So just to be clear I'm going to repeat it back to you, so reflective listening.

You would like me to draw a pathway, maybe a longitudinal axis of the drop line; is that what you want? Do you want me to scribble in the entire diameter of the pathway? What's --

Q. How about we just draw a line that would reflect the drop line going in and to the point where it terminates in the nexus. You don't have to scribble in every piece where the conductive material is. Follow me?

A. (Marking).

Q. Mr. Brooks, just for the record, is that what you did, you drew a line --

A. I tried, to the best of my understanding of your question.

MR. BARQUIST: May I see the demonstrative briefly? Thank you.

Q. We'll mark this one as RDX-13.

And so, Mr. Brooks, on RDX-0013, you drew a blue line that starts at the outside of the inner mold material along the cable that's coming into the inner mold material,

and then the blue line goes pretty much all the way across the nexus.

Would you agree?

A. No.

Q. The line that you drew was your best attempt to trace the drop line through the undermold to the point where the drop line terminates in the nexus, right? That's what I asked you to do, right?

A. The line becomes squiggly at the end because it becomes a dotted line. There's a solid line and then it starts -- then it dissipates into the nexus.

Q. And then, sir --

MR. OU: Your Honor, may I approach to give him a different colored pen?

JUDGE BHATTACHARYYA: Yes.

Q. Mr. Brooks, you have another slide from your direct, not annotated, and that's the one that you would use for the third aperture, second drop line limitation, right? Is that right?

A. Yes.

Q. We'll mark that as RDX-14.

A similar request, for the record, can you draw a line that traces the drop line as it enters the -- the second drop line as it enters the inner mold material to the point where you believe the second drop line terminates in

the nexus with the red pen?

A. (Marking).

Q. Mr. Brooks, we'll mark this RDX-0014. It's on the ELMO now.

Is it correct that, in response to my request, for the record, that you drew a line that traces the second drop line as it enters and goes through the undermold or inner mold material, and then to the point where you believe it terminates in the nexus, drew a line, a red line, across the path of the second drop line as it's approaching the nexus, and then I think you said you used some squiggles or dashed lines to reflect something else; is that right? Is that what this shows?

A. It is correct that there are dashed lines there.

Q. And, Mr. Brooks, what I just asked you to annotate and explain with respect to the first drop line, second drop line, the second aperture and third aperture, as well as your opinion for where the drop lines terminate at the nexus, do you have that same opinion for all of the products that you analyzed and provided an opinion on in your direct testimony with respect to both Voltage's products and Shoals' products?

A. With respect to the drop lines.

Q. Correct.

A. I would agree with that statement.

Q. With respect to the drop lines, you would agree with that statement.

A. Yes.

Q. With respect to the second and third apertures, would you -- do you also agree?

A. What am I agreeing to about the apertures?

Q. That the second and third apertures, in your opinion, their entire pathway, one of their ends stops right at the beginning of the nexus. In other words, the aperture does not go into the nexus for the reason that you gave a little earlier today.

A. That is consistent with my testimony.

Q. Right. And that's for all of the products that you analyzed and have provided an opinion on in this investigation for both Shoals' BLA products and Voltage's LYNX products; is that right?

A. I can't think of any exceptions.

MR. OU: Your Honor, I'm almost done, but something I need to go on the confidential record --

JUDGE BHATTACHARYYA: All right.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Let's move to the public record.

EXAMINATION BY THE COMMISSION STAFF ATTORNEY

BY MR. SHIN:

Q. Good morning, Mr. Brooks.

A. Good morning, counselor.

Q. It's good to see you again. You recall from our deposition that I asked you a lot of questions, right?

A. West Point grad, "Go Army."

Q. Let's go back to your deposition, if you would. I just want to go over some of the things that we talked about then.

At that time you had provided your expert report, right?

A. Yes.

Q. That was about 37 pages; is that correct?

A. The body of the paper was 37, and it had multiple claim charts that were of similar length, some of them.

Q. Maybe over ten claim charts, right?

A. Yeah, I believe there was about 120 pages in the whole document, something like that.

Q. And the expert report at that time addressed three of the relevant patents, right?

A. That's correct.

Q. So even the 37 pages didn't address the '153. It addressed the '739 patent, the '254 patent and '753 patent, right?

A. Yes, sir.

Q. All right. So let's go back to your deposition.

We did establish at your deposition that you are an expert in the solar industry, yes?

A. Yes.

Q. You're an expert, for example, in the National Electrical Code?

A. Yes.

Q. We also established that this is your first patent litigation case, correct?

A. Yes.

Q. And you're not an inventor on any patent, right?

A. Not on any patent.

Q. But you have reviewed a few patents before in your experience as a consultant in the solar industry, right?

A. Over the years, probably many patents.

Q. Okay. But because this is your first patent litigation case, it's the first time you've actually looked at a, for example, a file history.

A. I would agree with that.

Q. Or a provisional application.

A. I may have seen provisional applications in the past. I can't recall.

Q. Or a Markman Order such as -- example of what the ALJ issued in Order No. 20.

A. I'm confident I've never seen one of those.

Q. And you've never been involved with claim construction issues before.

A. Not that I recall.

Q. And I asked you if you had any -- if you had actually reviewed some of the Markman materials, and I believe you said you hadn't, right?

A. The Markman Order came out after our deposition, so there was -- at the time I believe there was only the records from the hearing available for my -- the hearing happened right before my report was due, so there was literally no time to read through that material.

Q. Okay. And you weren't at the Markman hearing.

A. I was not.

Q. And you did not review the parties' claim construction briefings that were filed prior to the Markman, right?

A. In the writing of the report, I reviewed all kinds of things, and so things that went into the Markman hearing were certainly relevant materials in writing the report.

Q. Hold on. Are you saying now that you did review the claim construction briefings?

A. I'm saying I reviewed many things, so I can't -- I'm saying this is -- the report was written in December. My understanding, correct me if I'm wrong, the hearing was in mid-December -- what was the date?

Q. We're going past that. Did you have in your possession at the time that you submitted your expert report the claim construction briefings of the parties? I thought we had established during your deposition that you did not even have them.

A. I can't recall. I don't remember talking about claim constructions from the Respondents.

Q. Okay. This is your first expert report related to infringement analysis, correct?

A. Yes.

Q. And your first time developing claim charts?

A. Yes.

Q. And at that time I believe you agreed that you were not providing any claim construction opinions; is that fair to say?

A. I don't understand your question.

Q. Were you construing any terms of the patent within the four corners of your expert report and claim charts?

A. Again, I'm an expert with 36 years of experience engineering these systems. I'm not a patent lawyer. The claim charts, my understanding, in my limited understanding of your world, is that claim charts are all about how a product practices a specific claim, and, in the process of doing that, there are clearly interpretations being made in explanations within the claim chart. I don't doubt that at all.

Q. You didn't provide any explicit claim constructions that were different from what had already been provided by the parties, and, for example, their agreed-upon constructions or their proposed constructions at that time for certain disputed terms. Do you agree with that?

A. My opinions were consistent with Shoals in the process of developing my claim construction.

Q. Okay. At that time you had not seen that Shoals had tried to construe the term "drop line"; is that correct?

A. I can't recall.

Q. And you did not construe drop line at that time, right?

A. I don't believe that's an accurate statement.

Q. You didn't explicitly describe your understanding of drop line in the narrative of your expert report, is that fair to say, explicitly?

A. I believe the report with the claim charts is

extremely clear on what a drop line is.

Q. Okay. But you did apply the claim constructions or the proposed claim constructions by Shoals.

A. If we compare the chart that shows Respondent, Claimant, Staff, a column for Claimant, since the Staff and the Respondent were very similar, if not identical, mine lined up with the Claimant.

Q. So you presented opinions -- you had opinions based on Shoals' proposed construction, for example, of aperture; is that fair to say?

A. In reference to the disagreements on the terms, yes.

Q. And so when you say "disagreement," are you saying that you disagreed with Staff's and Respondents' proposed construction, for example, for aperture? You disagreed with it?

A. Emphatically.

Q. However, you didn't opine on your disagreement explicitly in your expert report, correct?

A. I believe pictures are worth thousands of words, and we over and over and over showed in the claim construction what was meant and intended.

Q. Okay. But you didn't explicitly say in your expert report or during your deposition, I disagree with Staff's and Respondents' proposed construction for aperture

because -- and then go from there. You didn't do that, did you?

A. That sentence does not exist in the body of the report. All that information is in the claims.

Q. And then for the aperture terms, you provided, let's say, you did provide infringement opinions as represented in your claim charts; is that fair to say?

A. Yes.

Q. And I don't know if you said it explicitly or not, but you're presenting a literal infringement opinion.

A. Yes.

Q. But you are not presenting a doctrine of equivalents opinion, right?

A. No.

Q. And that was your first literal infringement opinion that you've ever done?

A. Yes.

Q. And doctrine of equivalents, you didn't present that, right?

A. No.

Q. I believe at the deposition you recall you didn't even -- you didn't even know what that term meant.

A. I was not clear on that since this is not my field.

Q. All right. Now Order No. 16 came out on February

20th, right, about a month ago, exactly a month ago?

A. About a month ago.

Q. And so when do you recall having seen Order No. 16?

A. If you could put it up on the screen... I don't remember your numbers and your orders. That kind of information doesn't stay in my mind.

Q. I'm just talking about the claim construction.

How did you become aware of the ALJ's claim constructions, for example, for aperture? Did you see a document and read the document that went through the ALJ's analysis?

A. Yes.

Q. And you saw that before the hearing certainly, right?

A. I did, yes.

Q. And there were certain things that -- okay. And did you agree with it?

A. I did. I did.

Q. In its entirety.

A. I thought it was well done.

Q. So she construed aperture, right?

A. (Nodding head up and down.)

Q. And she tentatively construed partially through, right?

A. Yes.
Q. She didn't construe drop line.
A. She did not put an "s" on drop line.
Q. Let's go to Order 16, if we can, if we can go to page 38.
I'm showing you what is the ALJ's Markman Order or Claim Construction Order and her Order No. 16, and on page 38 you see a table, and you may have seen something similar where the parties proposed various constructions, for example, here, aperture.
A. Yes.
Q. Okay. And you're familiar with this table?
A. Yes.
Q. And so earlier you said that you provided opinions on Complainant's or Shoals' proposed construction for aperture, right?
A. Yes.
Q. And when we look at this table in that column, there were two constructions or two proposed constructions, the first starting with an opening into or through something. Do you see that?
A. Yes.
Q. And you didn't provide an opinion on that, right?
A. I believe that was the position of the Complainant.

Q. Initially.
A. Yes.
Q. And then it changed to a modified proposal below that, right?
A. Yes.
Q. And the modified proposal was, quote, all or part of a pathway for the drop line feeder cable within the [undermold/primary mold], right?
A. That was the alternate construction.
Q. So what I was saying earlier was this is the only proposed construction that you provided explicit expert opinions on in your expert report and claim charts, right?
A. In my expert report dated December, mid-December, correct.
Q. So you didn't -- so even though you disagreed with everything to the right of the table under Respondents and Staff, you didn't explicitly provide opinions on them, other than that you disagree with them.
A. I believe that the report speaks for itself and was intending to show that those particular constructions of the Respondents and the direct cut-and-paste of the Staff in the third column were inconsistent with my opinion.
Q. Okay. In any case, you didn't think it was necessary to say that you disagreed or why you disagreed with these alternate proposals in your expert report, right?

A. The report and the claim charts were absolutely to disagree with these statements originally and how the claim construction, the discussions up to that point were made.

Q. Okay. We have Shoals' modified proposal, as you see here, and so your entire expert report was focused on this proposal, right?

A. Which proposal are we talking about?

Q. All or part of a pathway.

A. That, that was related to my report.

Q. Okay. And so that was -- are you saying now, in applying the ALJ's claim construction for aperture, that your opinion now is consistent with what you had in your expert report for Shoals' modified proposal for aperture?

A. I believe my testimony under oath was that the -- the information that was provided in the Markman Order, which clearly delineated and expressed Your Honor's position on these matters, I went back to look at how it affected my opinions related to the '153 patent, since now we are strictly dealing with the '153 patent and not the '254 patent, that related to the '153 patent, I was good with her judgment on that subject.

Q. Okay. In other words --

A. It was consistent. Sorry. It was consistent.

Q. So do you believe that Shoals' modified proposal

starting with "all or part of a pathway" is consistent with the ALJ's claim construction for aperture?

A. Not anymore, no. That -- the Markman Order has the word "entire," which is a cut-and-paste from the Respondents, and so there is an agreement that that is the statement, but then you must put that statement in the context of literally pages of discussion in the Markman Order that very clearly delineates what an aperture is, what it relates to, and it relates to a feeder, the feeder cable, the drop line.

And drop line wire is not there, so this is -- this is actually -- this is Respondents' and your copy of Respondents' into that, and that's not what the Markman Order says. It does not say wire.

Q. Okay.

A. It stops at drop line.

Q. Right.

A. And that's very key. Again, words are everything. There is no "s" on drop lines -- it's drop line -- and there is no mention of wire.

Q. Let me just try to say this -- let me ask you this.

So for Shoals' proposal, if it said all of a pathway for the drop line feeder cable within the [undermold/primary mold], do you think that would be

consistent with the ALJ's claim construction? Can you strike out --

A. It would say all of a -- of the pathway for the drop line within the undermold, I would agree with that statement, that is solid and it is, I believe, absolutely consistent with the ALJ's Markman Order.

Q. What I'm trying to get at is, in your expert report and in your claim charts, were you providing any opinion that there was infringement based on just the part of a pathway, or were you always providing an opinion that you were looking at the entire or all of the pathway?

A. Look at the top of this figure, this table, and it's aperture as related to the '254 patent, claims 1 and 7, and the '153 patent, claims 1, 21, and 24.

The term part related absolutely and specifically to claims related in the '254 patent. And they are unnecessary and irrelevant in the '153 patent, in my opinion, and my claim charts bear that out.

Q. Okay. Let's look at Staff's proposed construction. Do you see that?

A. Yes.

Q. And this is a cable test.

Are you familiar with that term from anything you've reviewed?

A. I believe I already commented on it in my

testimony. I commented on the cable test yesterday and said that that test was no longer relevant given the Markman Order.

Q. And you disagreed with it?

A. Clearly.

Q. Okay. And that's because -- all right.

Now the Staff's proposed construction, if you read it, and the ALJ's construction is the same except for the drop line wire, where the ALJ says "drop line" and Staff's proposed construction says "drop line wire," right?

A. Words are important, aren't they?

Q. Exactly. So you would agree with Staff's proposed construction to the extent it doesn't have "wire."

A. If you strike the word "wire," we're on the same team.

Q. Okay. And so if we struck the word "wire" earlier during your deposition, your expert report, you would have agreed that it's comparable to Shoals. You wouldn't have disagreed that they're different.

A. Specifically related to the '153 patent and my claim charts of the '153 patent, again, we're talking about a report that covered the '739, the '254, and the '153 patent, this would be specific to the '153 patent.

Q. But, again, during your -- in your expert report, your claim charts and your deposition, you didn't expand

upon that difference, did you?

A. The claims are specific and do not -- do not necessitate the word "part."

Q. Okay.

A. So, therefore, there can be a unifying principle here and the Markman Order -- I don't believe -- unless I'm wrong, I don't believe there was an objection to the -- the Markman Order is the Markman Order, and my understanding is that stands.

Q. So you view the Markman Order and the Judge's construction of aperture as entirely different from Staff's proposed construction and the cable test.

A. Without that word it's extremely different.

Q. Okay. Let's go to -- I want to pull up my SDX-2, the claim chart.

You're familiar with the '153 patent and its claims, right?

A. More than I want to be.

Q. I'm showing you what is marked as SDX-2, the claims of the '153 patent, and here we see claims 1 through 3. Do you see that?

A. I see a portion of the claims. I don't know whether this is -- is this the most recent version?

Q. Well, the claim hasn't changed. Yes.

A. Okay. So this is an accurate representation of

claim 1; is that your statement?

Q. Yes. Because I want to focus you on the bottom half of claim 1 where it starts, "an undermold that fully encases the nexus, the undermold further comprising."

Do you see that?

A. Yes.

Q. And we see three, sort of, sections underneath that. Do you see that?

A. I do.

Q. I just want to confirm that the three components of claim 1 in that section deal with a first aperture, a second aperture, and a third aperture; is that correct?

A. Yes.

Q. Okay. They focus on aperture and not on drop line; is that fair to say? It doesn't start with drop line is just my point. Do you agree with that?

A. The sentence does not start with drop line. What's your point?

Q. Right. Okay. And earlier -- let's go over your proposed construction for drop line. Because you are construing drop line; is that fair to say?

A. I don't understand the question.

Q. Are you presenting testimony where you are construing the term "drop line"?

A. I believe it's clear in my claim charts. It's

pointed to dozens of times. There's no question about what a drop line is in my report.

Q. What would you say now is a drop line? What are you saying is the definition of a drop line?

A. A drop line is the thing that takes solar power from the field and presents it to the nexus where it becomes one with the nexus, like one with the universe, and where the electricity is now able to enter, that's the point at which it enters the feeder cable.

Q. So you're providing no description of where the drop line begins or ends necessarily in what you just said, are you?

A. There is very clear information about where the drop line -- the drop line goes from the nexus to the connector. And so we can review that part of the claim, if you'd like.

Q. Okay.

A. It's very clear.

Q. So is it your -- are you making a nuance between how you define drop line and the pathway of the drop line within the undermold? Do you place emphasis on within the undermold?

A. Within the undermold is relevant in the claims. Clearly there's talk about undermold and their relationship to drop lines. And I understand that there's an attempt to

confuse here what's going on, but this is -- to someone, a POSITA, if you want to call it that, this is something that's very clear. If you pull somebody off the street almost, you could show them this stuff, and they would go, oh, okay.

Q. Is the entire pathway of the drop line the same as the entire pathway of the drop line under or within the undermold?

A. No.

Q. So there's a difference. The entire pathway of the drop line extends past the edge of the nexus, right?

A. It says it "extends from," right there. It's up on your screen right now. Let's point to it so in case you've forgotten.

It says, "wherein the drop line extends from the second aperture along a second longitudinal axis, wherein a second drop line extends from the third aperture along a third longitudinal axis."

Q. So you're reading from "extends from" to go into the undermold or out of the undermold?

A. Restate the question.

Q. Are you referring -- do you interpret "extends from" to go into the undermold or away from the undermold?

A. In this sentence it means extends from, extends from is extends from the aperture, meaning coming out of it

at that point.

Q. Coming out of it, right.

A. And there's another one that talks about a different direction. We can go to that, if you'd like.

Q. Okay. But, again, you're construing the entire pathway of the drop line to be longer than the entire pathway of the drop line within the undermold.

A. I hope so. Because if it stops at the undermold, we're all in big trouble. It doesn't do its job. The whole purpose of a drop line is to go from the connector, which is connected to the solar panels, and get that to the undermold, and it hasn't done its job unless it's done that, and it must pass through the molds, whatever molds there are, to seal it. The whole purpose of the molds is to seal them from the environment and get to the nexus.

Until I get to the nexus, I have not done my job. And, as I said yesterday, found two samples where there was no nexus, so the -- the drop line -- there was no drop line, because the drop line must have a nexus. Without a nexus, a drop line is just a wire. That's all it is.

Q. Okay. Mr. Brooks, I'm getting short on time. I'd like you to answer my questions yes or no, if at all possible.

A. Yes, sir.

Q. So what you were pointing to within those

paragraphs, the focus is on aperture, not on drop line within the undermold; is that fair to say?

A. No.

Q. Okay. Let's move on.

Let's look at the '153 patent, if we could pull that up.

And you're familiar with the '153 patent, right?

A. Yes.

Q. All right. Now earlier in your direct, counsel didn't -- let's say you were speaking about drop line, and I believe you said that one of ordinary skill in the art -- did you mention that term?

A. I remember -- I believe I remember saying -- restate the -- do you have the record? I'd rather see what the record said.

Q. Do you agree that you were construing drop line or defining drop line as what one of ordinary skill in the art would understand drop line to mean?

A. If they understood the context, yes.

Q. Okay. It's fair to say you were trying to construe drop line in its plain and ordinary meaning?

A. A person of ordinary skill in the art, if they were presented with this information and explained what these terms were, comparing them to what this thing is, which is inputs, and that's the way they are referred to

often, then they said, oh, input equals drop line, I got it.

Q. Okay. But earlier I think counsel said that -- let's say we were talking about a drop, right, a drop or a branch. Those are similar? Those are synonymous?

A. There could be many synonymous terms for this device.

Q. So you have input, branch, we have drop line, right, and we also have the term "drop"?

A. They are all terms.

Q. Okay. And did you testify that drop line is the same as drop?

A. I don't recall making that statement.

Q. Is drop line the same as a drop?

A. It may be.

Q. Okay. Or not?

A. A drop could be all kinds of things.

Q. All right. In your testimony this morning did you point to any location in the patent or file history that supported your construction for drop line, yes or no?

A. I don't understand the question. I'm really -- I have to think through every single word with you people, so I'm trying to understand what the question is before I say yes or no, because I don't want to get tricked. That's all.

Q. Okay. Did you point to anything in the patent or file history this morning relating to drop line?

A. I believe --
Q. I'm sorry. Not this morning. Yesterday's direct examination.
A. Yes.
Q. You believe you did.
A. Yes.
Q. Let's go through the patent. Let's look at column 2.
There were many figures, let's just look at the summary of some of the figures. All right.
Now you're familiar with Fig. 7 where it says Fig. 7 schematically depicts a joint with a compression lug, right?
A. I do remember this.
Q. And now yesterday you also made a big point about lead assembly, right? You said a lead assembly is the -- is several --
A. Mold drops.
Q. Mold drops, okay. And the patent does refer to lead assembly in accordance with what you're saying, right?
A. Yes.
Q. But it also refers to lead assembly as a single mold drop. Would you agree with that?
A. Reflective listening, are you asking me to say that a Big Lead Assembly could include a single mold drop?

Is that what you're saying?

Q. Yes.

A. It would be possible to construct one, yes.

Q. And so, for example, here, if we go down, Figs. 11 and 12 depict the overmold for dual drop line -- I'm sorry. It doesn't say line. Let me read that again.

Figs. 11-12 depict the overmold for dual drop lead assembly for 250MCM cable. Do you see that?

A. I see the words.

Q. And it calls it a lead assembly, right?

A. It is a brief, terse description of Fig. 11-12, which is clearly not fully descriptive.

Q. Okay. Can we look at 11 or 12?

So it's showing -- it's calling it a lead assembly, but it's really the mold drop, right?

A. That is correct. This is what we have been calling throughout this proceeding a -- in my testimony -- it is called -- it's the molding -- it looks like the exterior molding of a mold drop.

Q. If we look at Fig. 29, do you see there's two drops, right?

A. It looks like this except it's got two. I'm holding up --

Q. It has two drops, right?

A. Yes, I'm holding up CPX-0036.2.

Q. Okay. And let's go to -- back to column 2 at the bottom where it describes Fig. 29.

Fig. 29 depicts a dual drop lead assembly for 750MCM cable. Do you see that?

A. I see that.

Q. And it doesn't refer to it as a mold drop, right?

A. Again, a terse explanation of what the figure is.

Q. Okay. So here we see, in all of these figures we see that Mr. Solon referred to the embodiments in the figures as lead assembly, right, whether it be a longer lead assembly or even just a mold drop; is that fair to say?

A. I don't know what is being referred to here, again, because this is a terse explanation of a figure. I believe you're reading into this statement dramatically.

Q. Okay. And it also refers to drops, whether it be a single drop or a dual drop, without referring to drop line. Do you see that?

A. Again, I'm not going to read anything into that other than what it says.

Q. Okay. And if we could go to column 4, and if we look at the elements 15-38, do you see where it says at column 4, lines 15-37 -- but we'll focus on the top half.

The following structure numbers shall apply to the following structures among --

You're familiar with these elements and the way

they are labeled, right?

A. This is intended to help the reader identify things that are pointed to in the figures.

Q. 10 is lead assembly, right?

A. Yes.

Q. 12 is drop line? Yes or no?

A. It is, yes.

Q. I mean, you see where -- and you see where 13 is drop-line connector?

A. I do.

Q. 14 is feeder cable? Yes?

A. Yes, sir.

Q. 15 is feeder cable connector?

A. Yes.

Q. 16 is insulation?

A. Yes.

Q. 17 is joint?

A. Yes.

Q. 18 is exposed wire?

A. Yes.

Q. 19 is nexus?

A. Yes.

Q. 20 is compression lug?

A. Yes.

Q. 22 is undermold?

A. Yes.
Q. 24 is overmold.
A. Yes.
Q. All right. Now I'd like to go to Fig. 7, but I'd like to use RDX- -- the opening -- 1C at page 17. Let's go up one. Here. So RDX-1C at page 15. Do you see that?
A. I do.
Q. And it's Fig. 7, but it's annotated.
A. Yes.
Q. If you can look at that, we have just gone through the elements. I just want to make sure that you had some -- that you can see where the element numbers corresponded with the description in the patent.
Does this look accurate to you?
A. It appears to be accurate. I'd have to sit down with it to make sure and compare item by item whether it's consistent.
Q. Let's just blow up Fig. 7, please.
And do you see element 12? It's identified as drop line, right?
A. Yes.
Q. And it goes -- if we look at the top of it where the insulation is, at the top of the figure, it runs down, right?
A. Yes.

Q. And then it curves, right?
A. (Nodding head up and down.)
Q. And then it goes to the nexus, and it goes along the compression lug, and then it ends at the other side of the compression lug; is that right?
A. It's unclear whether it ends at the compression lug. I don't believe there's any intention for it to show it going beyond or anything like that.
Q. Okay. The drop line, as shown here, there's no explicit indication that the drop line ends at the nexus, right?
A. There is no statement on the figure that says the drop line ends at the nexus. It is clear that the drop line has accomplished its task of mating with the nexus and becoming one with it.
Q. And what we're talking about for second aperture is the entire pathway of the drop line, right?
A. Through the undermold.
Q. Within the undermold. So if we look at the pathway of the drop line within the undermold, here we see -- we can look -- can you do an arrow, please? Can you highlight that?
Where do you see that, sir?
A. What are you asking me to do, please?
Q. Let's go to the right side of the molding. The

edge of the molding, the aperture either starts or ends at the edge of the molding, right?

A. Yes.

Q. And what you testified to, it ends, if we draw a line and cut off the portion of the drop line as it meets the nexus.

A. The aperture ends at the nexus, absolutely.

Q. Okay. And so you are saying that the drop line does not extend into the compression lug.

A. If you're trying to get to the statement that that little piece is an aperture, I fundamentally believe you're wrong, and I believe that no one -- no POSITA would agree with you.

Q. Okay. And you were pointing to the drop line at the end of the left side of the compression lug. So the exposed wire 18, most of that, in your opinion, is not part of the pathway of the drop line.

A. Your question? I'm sorry.

Q. The exposed wire --

A. I'm sorry. I'm talking over you. Sorry.

Q. So the exposed wire 18, and as you saw in other pictures that Respondents' counsel pointed to, that's the portion of the wire underneath the compression lug, right?

A. Yes.

Q. And you said earlier it was irrelevant?

A. About what?

Q. It was irrelevant in your analysis and your opinions; you're not considering it.

A. It has nothing to do with the aperture as described in the patent.

Q. So do you view this as having, for this one drop line in the annotated Fig. 7, do you view it as having an aperture, from the edge of the right side of the molding extending to the edge of the nexus, as an aperture, right?

A. Yes.

Q. Okay. Is it also fair to say that, if you were to remove the exposed wire within the compression lug, that that would also be a separate aperture?

A. No.

Q. You can't call it an aperture at all. If you remove the wire, there's no void there?

A. I would say, as to the claim construction in the '153 patent, it is not referring to that. It's referring to the undermold passing through the undermold, as we saw in my claim construction and many, many slides that we went through, when I cut one of these devices, there was undermold material in the top place where there was a void, as explaining what you're saying, and that void was there because there was no drop line. Therefore, it had no aperture, because aperture and drop line are connected

together and connected at the hip.

Q. When you say "connected," you really mean overlapping, right?

A. They are conceptually connected to one another.

Q. Aperture is a new term.

A. In -- I'm speaking in relation to the '153 patent and the Markman Order. The Markman Order goes also into detail about removing the drop line and the pathway through the undermold that's left, when that drop line, said drop line, is removed. That's -- I believe the ALJ was clear on that.

Q. So we were talking earlier about the difference between a drop and a drop line, right? Do you think that there's a difference between a drop and a drop line?

A. I believe the statement in the specification was a terse explanation of the figure and was not intended to be a detailed explanation of what was in the figure.

Q. And there was two terms that we're looking at.

We're looking at a feeder cable, right, and here the feeder cable goes under the -- within the compression lug, right?

A. It does.

Q. Okay. But you're not excluding that portion of the feeder cable that goes -- that's within the undermold, are you?

A. At that point -- there's been no disagreement in my view of reading all the information about the aperture or the feeder cable, and so I don't understand the question.

Q. Okay. For the feeder cable to go continuously through the undermold, do you have to consider including the portion of the feeder cable that is the -- that passes through the compression lug, right?

A. It becomes one with the compression lug in the process of passing through the undermold.

Q. Okay. But in order to create the void in the undermold, you have to remove or notionally consider how the undermold looks if you take the feeder cable out, right?

A. For the aperture, the feeder cable, the Markman Order is clear that we remove the feeder cable and we can look through and see one aperture.

Q. So between the feeder cable and the drop line, you're not going to pull out the entire drop line, the entire cable that goes into the joint; you're only going to pull out the portion that stops at the nexus. Is that your opinion?

A. A drop line's, as I've said multiple times, purpose is to bring solar power from the array to the nexus, and once it's become one with the nexus, it's done its job and it is over.

Q. Okay. But your opinion is you're only looking at

part of the pathway of the drop line. You're only looking at the pathway up until it meets the point of the nexus, right?

A. To be clear, are you referring to the aperture?

Q. Well, I'm referring to what you believe needs to be done to remove the cable or the drop line. So for the feeder cable you're removing the entire feeder cable.

For the drop line, how much are you removing?

A. Of course this is a hypothetical. Can you agree with that? It's a hypothetical of removing the drop line, which is why, when we get into becoming one with the nexus, now we're talking about electrical conductivity and we're getting into theories of how electrical energy transmits through conductors and conductive materials.

So we can say with confidence that the drop line related to the undermold ends there, and if I were to try to extract this, since this has been crimped and it's impossible for me to physically pull it out, that I would remove right here, and if I were able to get it out of the undermold, and then I would see that there's a pathway, a tunnel, and then I would see at the end of that tunnel the nexus, which is the goal of the drop line.

Q. You would also see the remaining part of the cable. So what you pointed to with the arrow was you're still going to pull, notionally pull out the drop line wire

up until the point where it reaches the nexus.

A. For the -- for the purpose of aperture, again, aperture related to drop line, singular, no "s," not referring to wire, we're looking at the aperture of the drop line. "S" is really important, the word wire is really important, and they do not exist in the Markman Order.

Q. If we look at, for example, Fig. 37, we see an embodiment sort of in construction where the element 12 is the drop line, right?

A. Yes.

Q. It doesn't say drop line wire.

A. I mean, it does not say drop line wire.

Q. 12 is not drop line wire, and it doesn't say -- and 12 is not dropped.

A. I believe my memory that you showed is that it's drop line.

Q. And the drop line, at least in this figure from the right to the left where the 12 is identified, it spans -- fairly spans the entire length of the wire, the one wire that makes up two drops?

A. No.

Q. You don't agree with that?

A. Absolutely not.

Q. Okay. So you think this figure is misleading?

A. Not at all.

Q. Let me move on.

Yesterday you testified about Intertek and Intertek specific to Voltage, right?

A. I spoke about Intertek reports and certifications in general related to the 9703. I want to be clear about my testimony. And we talked a lot about the Intertek Report specifically related to the Voltage product.

Q. And I don't want to go on the confidential record, but, please, if you think a response is potentially confidential, please let me know.

A. Okay.

Q. Just, in general, for Intertek Reports, and you're familiar with Intertek Reports and other certification agencies, and in the one for -- relating to Voltage at least -- the Intertek Report doesn't call out any nuance between what a drop line is versus a joint or drop, does it?

A. The answer is, I believe, no, in my reading of these reports, because certification reports do not and are not connected to patent construction. They're connected to the actual product that's being reviewed and however the manufacturer of that product describes their product.

And so any terms that they would use would not be related to patent law or patent construction, it would be related to, if you call this an input, I'm going to call it

an input, and we know what we're talking about.

Q. So no report is going to refer specifically to a patent such as the '153 patent.

A. I've never seen that, no.

Q. It's written in a different way, a different focus.

A. Absolutely.

Q. And it doesn't refer to drop line or drop line wire necessarily.

A. I don't remember -- actually --

Q. It doesn't -- it doesn't analyze drop line in the way we're talking about now?

A. Right, certainly not in the --

Q. Certainly not aperture in the context of what we're discussing?

A. That's not an issue in a certification report.

Q. Thank you.

MR. SHIN: That's all I have.

MR. BARQUIST: Would this be a good time for the morning break, Your Honor, to organize for redirect?

JUDGE BHATTACHARYYA: If there is substantial redirect, yes.

MR. BARQUIST: I'll try to keep it short, but it might be 15 or 20 minutes.

JUDGE BHATTACHARYYA: Okay. Let's take a break.

Let's try to take a shorter break since we used up some time this morning, ten minutes.

(The hearing recessed at 11:00 a.m.)

(In session at 11:15 a.m.)

JUDGE BHATTACHARYYA: We're on the public record.

REDIRECT EXAMINATION

BY MR. BARQUIST:

Q. Mr. Brooks, let me ask you a few questions, if I could, to try to clarify a couple of things.

Let me just start with where we ended with Mr. Shin's questions. He asked you about -- in the '153 patent, he brought your attention to Figs. 11 and 12, which he pointed out reads, "depict the overmold for a dual drop lead assembly for 250MCM cable."

Do you see that?

A. Yes.

Q. And do you understand that that is not describing a dual drop assembly, dual drop lead assembly, but an overmold for a dual drop lead assembly? Do you understand that?

MR. OU: Objection, Your Honor, he is leading the witness.

JUDGE BHATTACHARYYA: Mr. Barquist, there's an objection to the question.

MR. BARQUIST: Your Honor, I'm just trying to

direct his attention to what Mr. Shin questioned him about.

JUDGE BHATTACHARYYA: The objection is sustained. That question and answer is stricken. You can ask about the subject in a nonleading manner.

Q. Mr. Brooks, do you recall being asked about Figs. 11-12 and their description in column 2 of the '153 patent?

A. Yes.

Q. And what do you understand Figs. 11-12 to be referring to?

A. The terse explanation is the overmold for a dual drop lead assembly for 250MCM cable. So, from English, it appears that the object is overmold.

Q. And then if I could direct your attention to column 3 and the description of Fig. 31 in the '153 patent, can you read that to us?

A. Fig. 31 depicts a dual drop lead assembly for 750MCM cable with overmold shown.

Q. So here's Fig. 31. Is that depicting a dual drop lead assembly for a 750MCM cable with overmold?

A. It is showing the overmold with --

MR. OU: Objection, Your Honor, leading again.

JUDGE BHATTACHARYYA: Objection is overruled.

A. This figure, as I've said many times, appears to be showing an overmold, a mold assembly -- sorry -- this is a mold drop, the term that I used consistently yesterday,

mold drop that has two drop lines, and it shows the feeder going through, which would be what we have termed and in discussion is a mold drop and is part of a lead assembly.

Q. Now there's been a lot of discussion this morning about a drop and a drop line.

In the context of the '153 patent, can you tell us what difference, if any, there is between a drop and a drop line with regard to the input to a nexus?

A. I've not seen a differentiation between those terms.

Q. Whether or not you've seen one, is there a differentiation in the context --

A. There is none, no.

Q. Let me finish my question.

A. Sorry. Sorry.

Q. Whether or not you've seen one, is there a differentiation in the context of the '153 patent between a drop and a drop line when we're talking about the input to a nexus from solar panels?

A. I don't recall seeing one.

Q. Again, whether or not you've seen one, in your mind, sir --

A. No.

Q. -- is there any difference between a drop and a drop line, the terminology, drop and drop line, when we're

talking about the input to the nexus of a Big Lead Assembly?

A. No.

Q. Let me put up one of the demonstratives that you created with Mr. Ou. This is RDX-11.

Do you recall this?

A. Yes.

Q. And can you explain to us why you drew those -- that blue area the way that you did?

A. I get to use this. Oh, it doesn't work. Sorry. I have to use old-school lasers.

I drew it like this because, consistent with the deposition of Mr. Shin, in talking with Cameron, the drop line ends, officially ends somewhere -- somewhere in the nexus. And so we can't be sure about exactly where, because it's electrically conductive material, and so, therefore, the drop line becomes one with the nexus, and that's why I showed a scribble area here, because the electrical power from this drop line is going to evenly distribute itself into the nexus throughout a circumference and throughout all the strands inside of it to do its job to electrically conduct to the nexus and provide -- do its job to get that power into the feeder.

Q. You were reluctant to identify a specific point within the nexus where you said the drop line ends.

Can you explain why that is?

A. The reason that is is that there is no specific gap in metal or anything. So we can say it's an electrically conductive path. It does its job. And, again, its purpose is to deliver power to that point, and when it's done its job, it's over with.

So to say that none of the electrical power from the drop line extends, you know, past the middle of the drop line would be technically inaccurate throughout that, but it absolutely doesn't go beyond the nexus whatsoever.

Q. Although you can't determine exactly where the first drop line or the second drop line ends within the nexus, can you specifically identify where the aperture through the undermold for the drop line exists?

A. Yes.

Q. And is that what you showed on -- in the yellow highlighting on the RDX exhibit, RDX-11?

A. Yes. That lower -- the lower highlighting right here, pointing to the bottom left of the picture, is the aperture as described in the patent.

Q. That's the second aperture?

A. It's the second aperture related to the first drop line.

Q. And then RDX-12, what is that --

A. Sorry.

Q. -- what have you highlighted on RDX-12?

A. Sorry. What I have highlighted in the bottom right is -- the bottom right is the third aperture that relates to the second drop line.

Q. By the way, Mr. Brooks, do you recall during your deposition in this case you were asked to identify on a page from your expert report exactly where the third aperture existed?

A. It's been a while, but sounds like a topic, yes.

Q. I'm going to put up on the screen Exhibit 25 from your deposition.

Can you tell us what is depicted on Exhibit 25 from your deposition?

A. So what's depicted in this picture is my annotations -- and I believe this was at the deposition -- of the aperture related to in this picture -- it's pointing to -- it says first drop line and it's pointing to the drop line coming in on the right side of the Voltage product. It's showing the aperture through the undermold up to the nexus and stopping at the nexus.

Q. So recognizing that at your deposition you were using a pen, is what you did at the deposition consistent with what's shown on RDX-12 or not?

A. Yes, it's consistent.

Q. Now I think we have already established, but let me just confirm.

When you drew that exhibit in your deposition, that was before the Markman Order was issued, correct?

A. Yeah. My deposition was in early January, something like that, and the Markman Order was quite a bit later.

Q. Now you were asked yesterday about whether any Shoals documentation referred to a drop line. Do you recall that?

A. Yes.

Q. And are you, in fact, aware of documentation that refers to drops in the context of an input to a nexus of a mold drop?

A. No.

Q. Let me refresh your recollection. Let me show you Exhibit JX-117, page 2.

Do you recognize this document, sir?

A. Yes.

Q. What is this?

A. This is a drawing of a two -- dual drop, two-drop, drop line mold drop, and showing the size of the conductor, and in the title of that it says "dual drop."

Q. What do you understand the dual drop is referring to in this Exhibit JX-117?

A. It is referring to the two drop lines that you see here.

Q. Let me show you another page from the exhibit, page 3. What does this indicate?

A. This says 250MCM to 500MCM quad drop.

Q. So are you aware of -- do you know whether or not there are additional Shoals documents that also refer to the input lines as a drop?

A. Yes.

MR. BARQUIST: Your Honor, I'd like to introduce the Shoals Intertek Report, which I know we earlier said we would not use, but given that Mr. Shin has raised questions about the distinction between a joint and a drop line, I think the Intertek Report will help us address that.

And so I raise this because I don't want to be accused of violating any agreements, but I think the door has been opened.

MR. SHIN: Your Honor, Staff would object to that. Staff referred to the Intertek Report in general, and I did reference a Voltage Intertek Report. I wanted to make sure that, if he said anything, that it was referenced -- it was in response to what Mr. Brooks testified during his direct. I didn't open the door to the Shoals Intertek Report, Your Honor.

JUDGE BHATTACHARYYA: Would you please repeat what you believe he asked about and what Mr. Brooks testified about on cross? Just repeat what you just said.

MR. SHIN: About the Intertek, Your Honor? I asked him questions about Intertek and certification in general, that they were not related to specific -- any patent-type terms. And I did mention the Voltage Intertek Report, because that came up during his direct testimony, but I didn't -- there is no intention of going into the Shoals Intertek Report.

JUDGE BHATTACHARYYA: You said that you asked generally about Intertek Reports. What did you ask generally about?

MR. SHIN: Oh, just that the certification doesn't relate to any specific patent. There's no linkage to any specific patenting or patenting terms, that it's -- it was Intertek or any certification agencies, their own type of analysis.

JUDGE BHATTACHARYYA: Okay. Mr. Ou?

MR. OU: Your Honor, I agree with Mr. Shin's objection. I don't think the door is opened for the reasons Staff has just explained. We had an agreement that Mr. Brooks could talk about the Voltage Intertek Report, but part of that agreement was that he could not talk about the Shoals Intertek Report, and there were various differences between what Mr. Brooks did in his expert report for Voltage versus Shoals.

And so Staff's questions, generally, and then a

reference to the Voltage Intertek Report and whether or not, you know, it discussed things of that nature, certainly doesn't open the door for him to now offer new opinions that he did not -- which clearly are directed to try to provide a representative product opinion, which was the subject of a prior order and discussion.

MR. SHIN: Your Honor, can we take this exhibit down? I don't know if it's confidential, but you haven't ruled on the objection.

JUDGE BHATTACHARYYA: I'm afraid I don't recall the exact testimony.

MR. BARQUIST: Your Honor, the question that was asked was suggesting that -- asking whether there was any distinction between a joint and a drop line, and that's the question that the Intertek Report will address. The implication was there is no distinction; whereas, it's clear from the Intertek Report that there is.

JUDGE BHATTACHARYYA: If the questioning is limited to that specific issue, is there any objection?

MR. SHIN: Yes, Your Honor. If he wants to go into that with the Voltage Intertek Report, no objection. But my question was, yesterday you testified about Intertek and Intertek specific to Voltage, right. That was my question, Your Honor. It was limited to Voltage.

JUDGE BHATTACHARYYA: All right.

MR. BARQUIST: Again, Your Honor --

JUDGE BHATTACHARYYA: If that's the question, then I don't think it's proper to go into the Intertek Report for Shoals, if that was the question.

MR. BARQUIST: That is one of the questions, but that's not the question that opened the door to this issue about whether -- he asked the question, is there a distinction between a joint and a drop line, and that's what the Intertek Report addresses. So it's not just in general. It's not with regard to the Voltage report. The Shoals report specifically does draw a distinction between a joint and a drop line.

JUDGE BHATTACHARYYA: The question was just generally is there a distinction between a joint and drop line, is that --

MR. SHIN: No, Your Honor. My questioning started with his direct testimony and the Voltage Intertek Report and it carried through. There was no intention to open the door to Shoals' Intertek Report. That's clear. We've had the previous objection on that issue, and it was clear in Staff's intent not to open the door.

JUDGE BHATTACHARYYA: Okay. If this is critical to you, I'll go back and review the transcript. I would have to do that now. I'm inclined to sustain the objection.

MR. BARQUIST: Okay, Your Honor. We'll accept

it. Thank you. I will not reargue the objection, Your Honor.

Q. So, Mr. Brooks, let me be clear. If a device -- if a two-drop line device, if those two drop lines are created with a single wire, what is your opinion about whether or not there are two drop lines?

A. My opinion is that there are two drop lines.

Q. And now did you hear -- well, one of the questions that Mr. Ou asked you yesterday was as follows:

"Question. And I think everyone in this courtroom knows that there is a dispute about drop lines and whether or not if a single cable can form two inputs, whether that's one drop line or two drop lines, right?"

A. I remember --

Q. Do you recall that question?

A. I remember the statement.

Q. Let me put up on the screen a page, page 159, from the Respondents' pre-hearing brief.

MR. OU: Objection, Your Honor. For one, we're on the public record. Your Honor, what he is putting up on the screen, from what I can tell before he took it down, is relating to Dr. Cameron's CT scans and opinions that she has offered. That wasn't the subject of direct or cross. I don't even believe that Mr. Brooks has ever even considered what's in her report. It's beyond the scope, Your Honor.

MR. BARQUIST: Your Honor --

JUDGE BHATTACHARYYA: You started saying that -- you started with a statement from Mr. Ou that I took it you wanted him to either to clarify or to have an opinion about.

MR. BARQUIST: I'd like to direct his attention to a statement written by Voltage's counsel in their pre-hearing brief. I'm happy not to show him the -- excuse me.

JUDGE BHATTACHARYYA: What testimony did he provide yesterday? I heard you talk about Mr. Ou's statement. What was the response to that statement?

MR. BARQUIST: The response was, I'm sure the Respondents disagree on that. I don't know that the Markman Order or the -- and then he was interrupted by Mr. Ou. I can hand up the testimony, if you wish, Your Honor.

JUDGE BHATTACHARYYA: It sounds like you're trying to discuss Mr. Ou's statement and not Mr. Brooks' testimony. I'll let you start and we'll see if the motion to strike is appropriate.

Q. Again, the question, Mr. Brooks, do you recall being asked by Mr. Ou this following question:

And I think everyone in this courtroom knows that there's a dispute about drop lines and whether or not if a single cable can form two inputs, whether that's one drop line or two drop lines, right?

A. I remember --
Q. Do you recall that question?
A. I remember making the statement.
Q. Now let me ask you, did you read the Respondents' pre-hearing brief in this matter?
A. Yes.
Q. And let me direct your attention to this statement on page 159 of the --
MR. OU: Objection, Your Honor.
JUDGE BHATTACHARYYA: Please take it down. Is this confidential?
MR. OU: I don't think he has laid a foundation for specifically what he is going to ask. The pre-hearing brief is 250 pages long, and he hasn't established any foundation that Mr. Brooks has read the entirety of that brief. I think he should lay some more foundation before he can show him the document.
JUDGE BHATTACHARYYA: I want to allow some questioning. I don't know where this is going. So I may allow a motion to strike once we see where the testimony goes.
MR. OU: Thank you, Your Honor.
JUDGE BHATTACHARYYA: If the brief is CBI, then please make sure that we're on the confidential record, if necessary.

MR. BARQUIST: May I ask Mr. Ou if he thinks this sentence is CBI?

JUDGE BHATTACHARYYA: Yes.

MR. BARQUIST: Thank you.

Thank you, Your Honor. I think I have permission from Mr. Ou to show this half of page 159.

JUDGE BHATTACHARYYA: All right.

Q. Again, Mr. Brooks, the question is:

What is the Respondents' position regarding whether or not a single cable that forms two inputs is one drop line or two drop lines, and I'm asking you, did you -- are you aware of this statement in the Respondents' pre-hearing brief that says, Voltage's accused Trunk Bus products use the same cable to form two drop lines?

A. Yes.

Q. And is that statement by Voltage in its pre-hearing brief consistent with your position?

A. It's my understanding, yes.

MR. BARQUIST: Your Honor, that's all I have. Thank you.

JUDGE BHATTACHARYYA: Thank you.

RECROSS-EXAMINATION

BY MR. OU:

Q. Mr. Brooks, can we pull back up the '153 patent, JX-0089?

Mr. Brooks, do you recall your counsel just redirected you and asked you about certain figures and what you believed the figure's terse description -- the patent's terse description of the figures, you interpreted what you believe the patent meant? Do you recall those questions?

A. I remember the series of questions.

Q. And it's your belief, based on your review of the intrinsic record, that when the '153 patent refers to lead assembly, it is referring to, as you've described it, the BLA assembly, which can include multiple mold drops along a DC feeder cable, and it's not referring to, for example, what you've talked about is a mold drop, right?

A. It's intended to discuss the entire concept of a lead assembly, assembly referring to multiple things, in this case we're talking about mold drops, multiple mold drops.

Q. And so when it's talking about the multiple mold drops and the entire Big Lead Assembly, you would expect that you would have DC feeder cable with multiple mold drops, multiple drops or drop lines, that's what it's describing, in your opinion, based on your review of the intrinsic record, right?

A. Yes.

Q. Can we go to the description of Fig. 31? Try to blow it up.

Mr. Brooks, do you see in figure -- the description of Fig. 31 of the '153 patent, it says Fig. 31 depicts a dual drop lead assembly for 750MCM cable with overmold shown? Do you see that?

A. I see that.

Q. Okay. It doesn't have that "for" language that you interpreted using English grammar that you testified on redirect, right, from your counsel?

A. What's the question?

Q. Based on your understanding of what this patent's disclosures discuss, what do you expect is going to be shown in Fig. 31? It's going to be a Big Lead Assembly, as you've described it, right, with a long feeder cable, DC feeder cable, multiple mold drops, right?

A. No.

Q. No?

A. No.

Q. If we go look at Fig. 31, we know that we're going to see a single mold drop or Big Lead Assembly, right?

A. Yes.

Q. And so let's go to Fig. 31.

You would agree that the patentee, Shoals, its named inventor, Dean Solon, when he wrote this patent application and he called this a lead assembly, he knew what he was talking about, right? It's his invention. You would

agree?

A. Counselor, you're reading into a very terse description of a figure that you could take out of context in any situation. As I've said in my testimony multiple times, context is everything. And you're trying to grab a little piece of something in a desperation to try to say that this is a Big Lead Assembly, and that's just absolutely false.

Q. You would agree that words matter, right, sir?

A. A terse explanation of a figure in a specification is not an explanation. It is just trying to provide a basic identification and has no other purpose in this specification and must be looked at in whole of the patent. And so you are looking at one corner of the elephant, and you have no idea that this is an elephant.

Q. Sir, is it a lead assembly, Fig. 31, yes or no?

A. It is not a lead assembly. It is a mold drop, as we've said many times.

Q. Yes or no? Please. I've only got a limited amount of time.

A. So do I.

Q. Mr. Brooks, the description of Fig. 31, do you think it was a mistake?

A. It is a terse explanation. It is an assembly, but it's only a portion --

Q. Do you believe it's a mistake, yes or no?
A. It's not the Big Lead Assembly.
Q. Not the Big Lead Assembly. The embodiment of Big Lead Assembly that Shoals sells, right?
A. It is an assembly and could be called lead assembly.
Q. Okay.
A. The term is not defined.
Q. You agree, sir, that the patent claims, in its claim, says lead assembly, yes or no, sir? Do you know that?
A. Terms are used --
Q. Yes or no, sir, does -- do the claims of the '153 patent recite a lead assembly, yes or no?
A. The word lead assembly is in the claims.
JUDGE BHATTACHARYYA: Please answer yes, no, or I can't answer yes or no.
A. Okay. Restate the question.
Q. Sir, do the claims of the '153 patent recite a lead assembly, yes or no?
A. Yes.
Q. And you would agree that the patentee's description use of the term lead assembly in the specification is relevant to understanding and construing what lead assembly means in the context of the claims, yes

or no, sir?

A. Context is everything, yes.

Q. And so when one looks to the patent, its figures, its descriptions, that's the evidence, intrinsic evidence, that we look to, to understand what the claims mean and what is their scope. You would agree with that, right, sir?

A. Yes.

Q. If we go to Fig. 33, Mr. Brooks, Fig. 33 is also a lead assembly, would you agree?

A. I would not agree.

Q. Now earlier Mr. Shin asked you some questions about Fig. 7 of the '153 patent. Do you recall those questions? Let me rephrase.

Earlier Mr. Shin asked you some questions about whether or not the drop line shown in Fig. 7 went into the nexus and underneath the compression lug.

Do you recall those questions?

A. I remember a series of questions related to Fig. 7.

Q. And your opinion is that the drop line of Fig. 7 ends outside of that compression lug.

A. That is inconsistent with my testimony. No.

Q. Where does the drop line for Fig. 7 end?

MR. BARQUIST: Your Honor, this is beyond the scope of the redirect. I didn't put up Fig. 7, nothing like

this.

JUDGE BHATTACHARYYA: Mr. Ou?

MR. OU: I'll withdraw the question.

Q. Mr. Brooks, you just testified that the words of the claim matter in understanding the scope of the claims, right, sir?

A. Yes.

Q. And your counsel asked you about was your belief as to whether or not a drop line and a drop mean the same thing. Do you recall that, sir?

A. In which context?

Q. Start with the patent. In the context of the patent, does drop line -- do drop line and drop mean the same thing?

A. I don't believe there's a distinction between the two.

Q. And is there anything in the specification that you can recall sitting here today that supports your view that drop line and drop are synonymous, that they mean the same thing?

A. I would have to review and provide -- you're asking me to provide a new opinion.

Q. Sir, I just want to know, because you've been working in this -- on this case in this investigation for many months, probably billed quite -- a large number of

hours to Shoals for your work, you're an expert, and this is a patent-in-suit. It's the only one left.

I just want to know, based on all that time and experience working on this case, whether or not you believe in the patent there is any support for your belief that drop line and drop are the same thing.

A. I can't say emphatically.

Q. And then Mr. Barquist asked you also about whether or not the word "drop line" was used in Shoals' documentation. Do you remember that question?

A. Who was the questioner?

Q. Your counsel.

A. Yes.

Q. And you first said no, but you did -- you first said no, right, sir?

A. I believe the question was related to the word "drop," the specific terse explanation in a figure of the word "drop" rather than "drop line."

Q. Right. And then Mr. Barquist asked you whether or not, in reviewing Shoals' documentation, working on this case, you had ever seen Shoals refer to inputs, strings, as drop. And you first said no, right? Yes or no, sir?

A. I don't remember --

Q. Your answer was no, correct?

A. That may be my first response. I didn't

understand the question.

Q. And then Mr. Barquist showed you a document. He said he was trying to refresh your recollection that Shoals' documentation does use the word drop, right, sir? That's what he asked you, yes or no?

A. Yes.

Q. And then after that he asked you whether or not you now believe that Shoals' documents use the term drop, and you agreed with him, right, sir? Yes or no?

A. Yes.

Q. Okay. Now sitting here -- did the document that Mr. Barquist showed you say drop line or equate drop line to drop? Yes or no, sir?

A. Did the document equate drop to drop line.

Q. Yes or no?

A. The figure that was shown, it was a terse explanation --

Q. Yes or no, sir? Yes or no, did the document that Mr. Barquist showed you equate drop line to drop, yes or no?

A. Yes.

Q. Sir, just for the record, this is JX-0117C, we're looking at page 2.

This is what Mr. Barquist showed you, right, sir?

A. Yes.

Q. He circled "dual drop" at the top, yes, sir?

A. Yes, sir.

Q. Okay. And nowhere on this document does it say dual drop and drop line -- does it say drop and drop line are the same thing, does it?

A. On that page, completely out of context, completely out of context. It does not have the word line.

Q. Right. Nowhere in this document does it say drop line, yes or no, sir?

A. On this page that word is not found.

Q. And sitting here today, you've worked on this case -- I believe yesterday you said you weren't aware of any Shoals' documentation that even used the word drop line.

Is that still your testimony?

A. I could not recall at the time whether the word drop line was used in their literature. This is deep in their literature among many, many pages of literature in a context where this term is understood.

Q. And this doesn't say drop line, yes or no? Does it say drop line, yes or no?

A. It does not say drop line. Yes.

Q. If there is a document from Shoals that said drop line or used the term drop line for its strings and inputs, do you think that Mr. Barquist would have showed you to try to refresh your recollection with it?

A. There are so many documents that the possibility

that the term exists, they have internal documents that absolutely have those terms. There's no doubt in my mind about that. The context of the discussion and the question had to do with literature that was going to people that were using this in the field and the question -- I could not recall whether or not that information had the word drop line in it, and I am not lying to tell you that. I don't recall. And I don't see how it's relevant.

Q. Sir, the testimony that you gave just now where you said you believe there's internal documentation at Shoals that would use the term drop line, is it true that when you said that you had in mind Shoals' internal patent application that uses the term drop line and nothing else? Yes or no, sir?

A. That was not in my mind.

Q. What is the internal document in your mind that you had when you made that statement under oath that you believe, that you believe talks about input, strings, branches, and calls them drop lines internal at Shoals?

A. Counselor, I'm not confused about this concept, and I'm -- I'm a bit frustrated.

Q. You don't have a document in mind, right, sir?

A. I have no specific document in mind, and I would have to form an opinion on that with the thousands of documents I've looked at. So it's unfair in this situation

to just say there's no piece of paper or there is a piece of paper for that particular question.

Q. Sir, do you remember when Mr. Shin -- you agree that the words in the patent matter, right, they're important?

A. The patent words absolutely matter.

Q. And we have to look to the specification to understand the scope of the patent claims, right, sir?

A. That is part of the process.

Q. Right? And your counsel asked you questions to reconfirm that your opinions as to infringement, which, I believe, yesterday you said -- you reviewed the patent, right, the '153, the specification, the file history?

A. Yes.

Q. And earlier you testified that you used the term aperture differently in the '254 versus the '153 patent, right, sir?

A. Yes.

Q. And --

A. Can I restate that statement?

Q. Mr. Barquist can ask you. You can explain after.

When you were analyzing the patents in this case for purposes of technical domestic industry and infringement, did Shoals' counsel instruct you or did you determine on your own that you could apply different

meanings to the same term in patent claims when determining what is their scope? Which one is it?

A. I am going to restate my last answer, since you're asking yes/no questions, but when I wrote my report we clearly showed through Mr. Shin's questioning that the term aperture was used by me in a certain way.

Then the questioning went to as related to the '153 patent, does it change my opinions related to how the term aperture, that has been adopted by the ALJ, clearly, whether it changes my opinion on the infringement.

So this is a new and different definition of the term aperture. I did not use different -- I did not use different definitions of aperture when I wrote my report.

You're talking about things that are after the fact, ex post facto, that I was asked again to see if that changed my opinion, and in my testimony I said it did not change my opinion.

Q. It didn't change your opinion ultimately of infringement on the '153 patent.

A. Correct.

Q. But you did change -- you used a different definition of aperture, right? Yes or no, sir?

A. When asked --

Q. Yes or no, sir?

A. What is your question? Because I don't

understand it.

Q. I'll ask it again. After the Markman Order -- before the Markman Order, you had an opinion as to infringement on the '153 patent, and after the Markman Order you testified that your opinion didn't change, right, sir?

A. No.

Q. Yes or no?

A. No.

Q. Your opinion did change as to infringement and tech DI after the Markman Order?

A. If you will let me explain, I'll tell you why --

Q. All I want to know, sir, I want you to confirm -- the record is what it is; we know what you've testified to -- did you apply a different meaning of aperture for purposes of infringement and technical domestic industry between your expert report for the '153 patent and yesterday during your direct testimony and today as your testimony has continued, yes or no? Did you provide a different -- did you apply a different meaning, yes or no?

A. I can answer that question. I applied a different meaning in the use of the term.

Q. Same result, but different opinion, new opinion. New usage of a -- new usage of a meaning, right, sir?

A. I have no choice in the definition of aperture. That has been determined.

Q. Okay. And the definition that you used, right, was different than -- the definition for aperture was different than the definition that you applied for the '254 patent in your expert report, yes or no?

A. I'm confused by the question. I'm getting turned all around in your questioning.

MR. OU: Your Honor, I have no further questions.

JUDGE BHATTACHARYYA: All right.

EXAMINATION BY COUNSEL FOR ITC STAFF

BY MR. SHIN:

Q. Mr. Brooks, I'm showing you what has been marked as RDX-11. Your counsel showed this to you earlier.

Do you see this?

A. I do.

Q. So the yellow portion is the second aperture in your opinion, right?

A. At the bottom left of the -- yes.

Q. And you previously marked the blue portion, and earlier you testified that that's not relevant to your analysis.

A. For the aperture it's not relevant.

Q. But for the drop line, do you agree that it's part of the drop line?

A. It's part of the drop line.

Q. The drop line includes that entire blue area?

A. The drop line is indistinguishable in that area as to where it ends. So there's electrons from that or there's power from that that proceed all the way through to the other end of the nexus.

Q. And the blue area that you marked, that is exposed cable or wire, correct?

A. Exposed cable or wire that is compressed under high pressure to -- with the compression lug and, in this case, to the feeder.

Q. There's no insulation on that exposed wire.

A. It's bare. We call it bare.

Q. And the same with the feeder cable. The feeder cable also has exposed wire where there's no insulation, right?

A. Bare.

Q. Excuse me?

A. Yes, exposed is the term.

Q. What you were testifying earlier was the blue area is compressed, but it is also compressed with the feeder cable, the exposed portion of the feeder cable as well; is that right?

A. Yes.

Q. And now you also see the undermold in white, right?

A. Yes.

Q. Here we don't have an overmold.
A. Correct.
Q. And the compression lug is within the undermold; is that fair to say?
A. The compression lug is surrounded by the undermold.
Q. And the exposed portion of the feeder cable is within -- technically within the undermold, right?
A. Only -- only under the fact that it's -- it's inside the nexus, compression lug, and the compression lug has inner molding all the way around that, because that's part of the process.
Q. In other words, since the compression lug is within the undermold, everything within the compression lug is also within the undermold.
Do you disagree with that?
A. It is part of the assembly.
Q. All right. I mean, we can see for ourselves whether it's -- that it is within the undermold.
A. Physically inside the undermold.
Q. Okay. And as well the line -- what would you call the wire that is part of what you have identified as the second aperture? What is that wire? What is the term that you would use to call that, that goes from the left side all the way to the right side out, that is what you

refer to as the second drop line?

A. I would refer to it as the termination point of the drop line.

Q. But what do you call the wire, in manufacturing, you place the wire into the machine, and then the compression lug, and it compresses it, what is that wire?

A. Aluminum?

Q. It's an aluminum wire and has a certain MCM, maybe, characteristic, right?

A. Circular MILS, yes.

Q. Can you call it a drop line wire?

A. For that portion of it, again, because it's indistinguishable where it's delivering -- doing its job, again, coming back to the job of a drop line is to deliver its power to the nexus. And since there's no distinguishable point at which it's been cut or anything like that in this case, it would do its job throughout the length of the nexus technically.

Q. Okay. But I'm actually asking, what would you call the wire that you place during manufacturing that ultimately becomes the two drop lines? I want to know what you call the wire, what your term is for the wire that goes in the left side and then comes out the right side through the second drop line. What is that entire pathway if it's not drop line wire? I mean, would you agree it's drop line

wire?

A. There were three questions right there. There were three questions.

Q. Let me rephrase, then.

Is it fair to say that drop-line wire, as viewed on this demonstrative, would include the entire portion of the wire from the left where the start of your yellow annotation is for your second aperture, it would continue under the compression lug where you have the blue pen annotations and would then go out the second aperture and out the undermold?

A. No.

Q. What would you call that?

A. A wire.

Q. Just a wire, generically.

A. Until it becomes part of the nexus, it's just a wire, like any old wire.

Q. Okay. Let's go to SDX-2 again, please, my claim chart.

Earlier I showed you the claims, and I just want to refresh -- to orient ourselves.

So you're familiar with the claim terms. And so we didn't look earlier -- I focused you earlier on apertures within the undermold: first aperture, second aperture, and third aperture.

Do you recall that?

A. I'm sorry. Ask your question again?

Q. Well, earlier, if you recall, I focused you on the portion of claim 1 that deals with what is within the undermold: a first aperture, a second aperture, and a third aperture.

A. Yes.

Q. Right? All right. If we go down to -- there are other claims too. If we go down to claims 2 and 3, you're familiar with claims 2 and 3, right, they're dependent claims?

A. Haven't looked at them for a while.

Q. But I've struck through them here because I'm representing to you that they are no longer asserted.

A. I take your word for it.

Q. I'm going to read claim 2.

"The lead assembly of claim 1 wherein the drop line includes a section of exposed wire at the nexus."

Did I read that correctly?

A. Yes.

Q. And you understand what that means?

A. I do.

Q. And I'm going to read claim 3.

"The lead assembly of claim 2 wherein the feeder cable includes a section of exposed wire at the nexus."

Did I read that correctly?

A. You did.

Q. Do you understand what that means?

A. I do.

Q. Now we're going to go back to claim 1, and we can see up there where it starts "a feeder cable."

A. Okay.

Q. And you're familiar with this term? This was an element that you identified earlier or yesterday, right?

A. Yes.

Q. Okay. "A feeder cable electrically coupled to the drop line at a nexus."

Did I read that correctly?

A. I believe you did.

Q. And based on the reading of dependent claims 2 and 3, do you disagree that an exposed wire of the feeder cable is electrically coupled to the exposed wire of a drop line at a nexus?

A. They're electrically coupled.

Q. And the exposed wire is what's electrically coupled; is that fair to say?

A. That's how you do it. They are conductive materials and they are electrically conducted.

Q. Okay.

A. Coupled.

Q. So the exposed wire is part of the drop line.

A. The exposed wire of the drop line is part of the drop line.

Q. And so if we go back to Fig. 7, and I put up that demonstrative in RDX-1C at page 16 or 17 -- I don't remember.

MR. BARQUIST: Once again, Your Honor, Fig. 7 was not part of the redirect. This is beyond the scope if we're going into Fig. 7.

MR. SHIN: Your Honor, your indulgence. I just want to tie this up. One question. One or two questions here.

JUDGE BHATTACHARYYA: Does it relate to this same issue that you've been talking about?

MR. SHIN: Yes, Your Honor.

JUDGE BHATTACHARYYA: I'll allow it.

Q. So if we look at -- I think it's RDX-1C, and it was page 15. You have a different version.

And do you recall we were talking about Fig. 7 earlier?

A. I do.

Q. And so element 18 is the exposed wire. Do you see that?

A. Yes.

Q. And it is within the compression lug?

A. That is the intention.

Q. And that is providing the electrical connection to the nexus and the feeder cable?

A. That is where it electrically connects to the nexus, which connects to the feeder cable, yes.

Q. And the exposed wire is necessarily part of the drop line.

A. Yes.

Q. Okay. Thank you.

MR. SHIN: That's all I have, Your Honor.

JUDGE BHATTACHARYYA: Okay.

REDIRECT EXAMINATION

MR. BARQUIST: Just one thing, hopefully very briefly, Your Honor. I'll try to do it without exhibits if I can do it quickly.

Q. You were asked a lot of questions, Mr. Brooks, by Mr. Ou just now about whether you applied different meanings to aperture in the course of your analysis.

A. Yes.

Q. And if I can quickly summarize, your original understanding of aperture was all or part of the pathway for the drop line, correct?

A. Yes. Yes, sir.

Q. And the Court's Markman Order says the entire pathway for the drop line, correct?

A. Yes.

Q. I'm paraphrasing or shorthanding it.

A. Yes.

Q. That's essentially it? So can you explain to us why in your view your application of the meaning of aperture is consistent even though earlier you used all or part and now you're using entire with regard to pathway?

A. The primary distinction related to the '254 patent had to do with parallelism. '153, that parallel construction, parallelism, is not in that, and, therefore, the term entire pathway or the entire pathway of the drop line being the aperture for the drop line is -- my view of it -- is consistent with the Markman Order.

Q. And consistent with the "all" of the pathway part of your original understanding?

A. Yes.

Q. Is that right?

A. It would be the "all" part of it, because it's all or part.

Q. Thank you.

MR. BARQUIST: That's all I have, Your Honor.

MR. OU: Your Honor, just one final confirmation question.

RECROSS-EXAMINATION

BY MR. OU:

Q. So, Mr. Brooks, you were applying a different interpretation of the term aperture for the '254 and the '153 patent, agreed?

A. Not in my report.

Q. In your report for the '254 you used part of the pathway in interpreting aperture, but in the '153 patent you used all of the pathway for the term aperture. Did I get that right?

A. There is an "or" between all and/or. "Or" means something.

Q. So you used a different -- a different interpretation of aperture for the '254 and the '153, right, Mr. Brooks?

A. For the '153 it doesn't matter whether it's all or part. All works for that patent.

Q. And so your application was different between the '254 and '153 for the term aperture, yes or no, sir?

A. No.

MR. OU: No further questions, Your Honor.

JUDGE BHATTACHARYYA: All right.

MR. SHIN: Nothing further from Staff, Your Honor.

JUDGE BHATTACHARYYA: All right. Thank you.

Mr. Brooks. You may step down.

THE WITNESS: Thank you.

MR. SEARS: Good afternoon, Your Honor. Rex Sears of Maschoff Brennan for Shoals. At this time we call Dominic Bardos.

DOMINIC BARDOS,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Welcome, Mr. Bardos.

DIRECT EXAMINATION

BY MR. SEARS:

Q. Good afternoon.

A. Good afternoon.

Q. Could you take just a minute and give yourself a more complete introduction for the Court?

A. Good afternoon, Your Honor. My name is Dominic Bardos. I'm the chief financial officer of Shoals Technologies Group, Incorporated.

Q. And how long have you been in that position?

A. I have been in the position since October of '22.

Q. And what are your responsibilities in that position?

A. As chief financial officer, I'm responsible for all of the accounting, investor relations, the financial planning and analysis, treasury, internal audit, items like

that.

Q. And have you been in the same position your whole time at Shoals?

A. Yes.

Q. Do you have prior experience as a CFO?

A. I do. Previous companies, about five years.

Q. Okay. And then do you have additional accounting experience beyond your CFO roles?

A. I've had over 35 years of financial planning, analysis and accounting roles in my career.

Q. Do you hold any degrees?

A. I do.

Q. Please tell us what those are.

A. I have a Master's of Business Administration with a concentration in finance from the University of Memphis, the Fogelman College of Business and Economics, and I have of Bachelor's of Business Administration with a focus in management, also from the University of Memphis.

Q. So let's talk a little bit more about Shoals.

Are you familiar with Shoals' products?

A. I am.

Q. Are you familiar with Shoals' combine-as-you-go solution?

A. I am.

Q. How does the BLA relate to the combine-as-you-go?

A. The BLA is the foundational product of our combine-as-you-go solution.

Q. And why do you say that?

A. Well, the foundational nature of it is that that is the way it -- get all the energy that we've been talking about gets combined on the way to the inverter.

Q. Fair to say that it's called combine-as-you-go because combining happens at the BLA?

A. That is correct, that's a fair way to characterize it.

MR. SEARS: Your Honor, at this time we will be moving into Shoals' CBI.

(Whereupon, the hearing proceeded in confidential session.)

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS	STAFF
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C E R T I F I C A T E

TITLE: IN THE MATTER OF CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1365

HEARING DATE: March 20, 2024

LOCATION: Courtroom B

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: March 20, 2024

Signed:

ss// _____

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// _____

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// _____

UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

----------x

OPEN SESSIONS

Pages: 720 through 1036 (with excerpts)

Place: Washington, D.C.

Date: March 21, 2024

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

----------x

International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Thursday, March 21, 2024

Volume IV

The parties met pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

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*** Index appears at end of transcript ***

P R O C E E D I N G S

(In session at 9:31 a.m.)

JUDGE BHATTACHARYYA: Just to take care of a couple housekeeping matters before we begin.

I did receive the email from the parties regarding the time estimates and request for guidance regarding the extra 15 minutes for the NEXT Advocate for Voltage.

We can assume that we're going to go an extra 15 minutes tomorrow. So if the parties want to divide up the time with that in mind with Voltage having the extra 15 minutes, that's what I would -- I assume that would work.

Is that acceptable?

MR. COYLE: Yes, Your Honor. So you're saying we would extend the day to 5:15 tomorrow?

JUDGE BHATTACHARYYA: Yes.

MR. COYLE: Understood, Your Honor. Thank you.

JUDGE BHATTACHARYYA: Is there anything else anyone wanted to bring up before we continue with Mr. Bardos?

MR. COYLE: Yes, Your Honor. There is also the matter of, I think we will have some administrative duties to complete at the end of testimony and before the evidentiary record concludes or closes.

JUDGE BHATTACHARYYA: Right.

MR. COYLE: So it would be helpful to receive Your Honor's guidance as to when you would like the testimony to finish so that we set enough time -- set aside enough time to complete the housekeeping. We don't want to keep you later than you would like to be here.

And then knowing that will enable us to meet and confer to make sure we're in agreement on how much time is remaining for each party.

JUDGE BHATTACHARYYA: Okay. We can assume that we can go with the testimony until 5:15, and then we'll take a break and come back to admit the exhibits, but I would hope that the parties can cooperate and make sure that that time that we need to take off is as short as possible.

MR. COYLE: Understood. We'll do that. Thank you.

JUDGE BHATTACHARYYA: Thank you.

MR. SHIN: Your Honor, for today, is it okay to go until 6:00 --

JUDGE BHATTACHARYYA: Yes, I'm assuming we're going to 6:00 today.

MR. SHIN: Thank you, Your Honor.

JUDGE BHATTACHARYYA: We're going back to the Shoals confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We'll move back to the public record.

CROSS-EXAMINATION

BY MR. COYLE:

Q. Good morning. Jordan Coyle for Voltage.

Good morning, Mr. Bardos. How are you?

A. Doing well. Thank you.

Q. Good to see you. You were just a little box on the screen in your deposition.

You were here in the courtroom for Mr. Tolnar's testimony earlier this week?

A. I was, yes.

Q. And Mr. Macias' testimony?

A. I was.

Q. For the entirety of both?

A. Yes.

Q. And were you here for Mr. Brooks' testimony?

A. I was excluded from a majority of Mr. Brooks' testimony. I believe it was confidential for Voltage.

Q. Were you here for the portions that were either public or confidential for Shoals?

A. Yes.

Q. Are you familiar with the term person of ordinary skill in the art?

A. I've heard it applied for items like this, but I've never had it applied to myself, no.

Q. So you wouldn't consider yourself a person of ordinary skill in the art in the context of this case.

A. I consider myself very ordinary.

Q. I take that as a no.

A. That's a no.

Q. Okay. You started working at Shoals in October 2022?

A. That's correct.

Q. And you referenced Ms. Lund in your testimony yesterday.

She started working at Shoals in May 2021, right?

A. I don't recall her exact date. It's probably in the spreadsheets that we provided, but that sounds about right.

Q. Okay. We'll take a look at that. Thanks.

You mentioned that you signed two declarations in support of the original complaint and then the amended complaint in this case, right?

A. I believe I signed three.

Q. Three declarations.

A. There was an original declaration, a second declaration adding an additional patent, the '153, and then a declaration clarifying a job description that was a legacy

position description from a certain type of injection molding machine.

Q. Okay. And that third one was more recent. It was in connection with a motion for summary determination, right?

A. I have no idea exactly. I was just clarifying that that position description was no longer applicable.

Q. Okay. Fair enough. Let's think back just to those first two declarations, the ones that you signed in conjunction with the complaint. Okay?

Now when drafting those you relied -- you testified yesterday you relied heavily on your accounting and finance team, right?

A. Yes.

Q. When drafting those, you did not speak to engineers, right?

A. I did, but I didn't draft the documents.

Q. In conjunction -- so you didn't draft the declarations.

A. No, I drafted the declarations with assistance, but I was also speaking with engineers, but my team did the work on the spreadsheets.

Q. When you spoke with engineers, that was not in conjunction with the preparation of your declarations, right?

A. Well, as I testified earlier, for example, I was speaking with engineering when I first reviewed an Intertek Report. That was during this time period of preparation before the first declaration was filed. So I'm trying -- just trying to be clear, I did speak with engineering. I'm not the one that solicited the exact inputs into the spreadsheet. That was through Ms. Lund and the team.

Q. Okay. Sir, do you remember having your deposition taken in this investigation?

A. I do. I believe it was in December.

Q. And you told the truth in your deposition, right?

A. Of course.

Q. Okay. Dave, could we bring up JX-205C at page 15, please?

Sir, I'm going to read the text on the screen here, and I just want you to know if -- I want you to tell me if I read it correctly.

The question is, and were there other people inside of Shoals that you consulted with, for example, on the technical side, maybe any engineers?

And the answer is, I personally did not speak with engineers.

Did I read that correctly?

A. That's correct. You read it correctly.

Q. And you didn't speak with any expert witnesses

when drafting your declaration, correct?

A. Expert witness being external to Shoals?

Q. Correct?

A. I did not.

Q. And, in fact, as of the date of your deposition in December that you noted, at that point you still had not spoken to any expert witnesses, right?

A. Correct.

Q. In the preparation of your declarations in this investigation, you were informed which products to consider for the DI analysis, correct?

A. That is correct.

Q. And when preparing your declaration, did you review any Shoals product catalogs?

A. I do not recall reviewing specific product catalogs.

Q. And at the time of your deposition you had not seen a recent product catalog, right?

A. I don't recall having seen a recent one during my deposition.

Q. And, similarly, at the time of your deposition you couldn't recall the last time you had seen a product catalog, right?

A. That's correct.

Q. Yesterday, sir --

May I approach, Your Honor?

JUDGE BHATTACHARYYA: Yes.

Q. I'll just put this in front of you, sir.

Mr. Bardos, yesterday your counsel asked you to look at CPX-36.1, and that's in your hands right now, right?

A. Yes.

Q. And you described that as two halves of a mold drop, right?

A. Yes.

Q. As we discussed, you were deposed in this matter, correct? And I assume you reviewed your deposition in preparation for your testimony today?

A. Yes, to some level.

Q. All 366 pages of it?

A. I believe there was a lot of indexing of words at the end of it, so yes.

Q. Okay. Do you recall how many times you used the term "mold drop" in your deposition?

A. Oh, I do not.

Q. Would it surprise you if you didn't say it a single time?

A. I'm sure we're talking about in-line fuses and Big Lead Assemblies, so the concept of one individual mold drop was probably not mentioned.

Q. Okay. So that wouldn't surprise you that you

didn't use --

A. It wouldn't necessarily surprise me.

Q. Okay. Is the term mold drop something that you adopted when preparing for your testimony today?

A. I don't specifically talk about individual components often. So I would say mold drop is something that we use consistently. It's always been on our purchase orders or quotes, the number of drop lines has been on our quotes in terms of ranges, and that's how we talk about it when I'm on the manufacturing floor with the team. So I would say not particularly in preparation for this. I would also say that I have more experience now than I did at the time of the deposition.

Q. You have more experience with sort of the technical aspects of what's in your hand right now than you did at the time of your deposition?

A. I've had the opportunity as a Shoals executive to spend more time with executives on the floor, taking customers on tours, seeing more manufacturing. I've had the opportunity to be around manufacturing quite a bit.

Q. Shoals sells different kinds of BLA products, right, with different numbers of drop lines?

A. That's correct.

Q. So one drops, two drops, all the way up to eight drops?

A. I don't know if we've ever sold a one. I can certainly say that we've sold multiple drop lines per mold drop on a BLA line.

Q. And as you just -- sorry. Are you finished?

A. I don't know that we've ever sold a one-to-one.

Q. Okay. And as you were just discussing with your counsel, you have also sold EV BLAs, right?

A. Not as a separate category. There's no revenue associated with EV BLA. There was about 500 produced at the time we were looking at it. There's no direct revenue included with EV BLA. It was a subcomponent of some EV installations with power stations.

Q. So you have produced EV BLAs, that's fair to say?

A. We've produced around 500, yes.

Q. The investments that you testified about, going through all those spreadsheets -- you can put that down -- all the spreadsheets that you went through with your counsel, they are directed to all BLA products, correct?

A. They were -- we pulled the S-BLA product family, not all the products. As I mentioned, the disconnect boxes, we did not include, and I would say those are a direct relation to BLA, but we did not include that, because it was identifiable as a separate product. The lowest separation that we have in our systems is S-BLA as a product type.

Q. Okay. So I'll be more specific in my question,

then.

The spreadsheets that you reviewed with your counsel, they covered expenses or investments associated with BLAs regardless of the number of drop lines. In other words, one-drops, if you sold any, all the way up through eight, right?

A. That would be correct. The average for the dataset provided to you was probably 18 mold drop -- drop lines per BLA. So there had to be more than one mold drop to complete that. The maximum per mold drop, as you see, is eight. So if the average is 18, you had to have at least three mold drops to complete a BLA.

Q. And there were also some expenses associated with EV BLA in some of the spreadsheets that you reviewed with your counsel, correct?

A. At the time we were pulling all of it, yes.

MR. COYLE: At this time, Your Honor, we should go on the Shoals confidential record, please.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We'll move back to the public record.

MR. SEARS: Yes. Your Honor, at this time Shoals calls Clarke Nelson.

CLARKE NELSON,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. SEARS:

Q. Good morning, Mr. Nelson.

A. Good morning, Mr. Sears.

Q. To begin, could I ask you to explain to the Court some of your education and your professional certifications?

A. Sure. I have an MBA degree from the Wharton School at the University of Pennsylvania, and I hold a Bachelor of Science degree in accounting from the Marriott School of Business at BYU.

Q. How well-regarded is that Marriott school for accounting?

A. Very well-regarded, one of the top accounting programs in the country.

Q. And do you hold any certifications?

A. I do. I hold several. I'm a certified public accountant. I'm certified in financial forensics. I'm a

chartered global management accountant. I'm also accredited in business evaluation. And I've been a longtime member of the American Institute of Certified Public Accountants.

Q. Mr. Beall, next slide, please.

Mr. Nelson, could you please describe some of your experience, your work experience?

A. Sure. I started my career almost 27 years ago with one of the "Big Five" accounting and consulting firms. I've been a partner in national and global consulting firms. And most recently, in 2016 I became a senior managing director and founder of In Fact Experts, which is a firm that specializes, among other things, in areas of forensic accounting, the valuation of intellectual property, calculation of damages, with a particular emphasis and focus on IP matters and patent infringement matters.

Q. And then do you apply your education and training in any public service capacity?

A. I do. I currently serve on the Board of Education of the Granite School District, which is a urban/suburban school district with about 60,000 students, a diverse school district, and specifically I serve as the audit committee chair for the school district, which has approximately about a billion dollars of annual spend for the district.

MR. SEARS: Your Honor, at this time Shoals moves

that Mr. Nelson be qualified as an expert in the areas of accounting and the analysis of economics associated with intellectual property.

JUDGE BHATTACHARYYA: Any objection?

MR. COYLE: No objection, Your Honor.

MR. SHIN: No objection by the Staff.

JUDGE BHATTACHARYYA: At this time Mr. Nelson is admitted as an expert in the areas of accounting and the analysis of economics associated with intellectual property.

Q. Mr. Nelson, can you give us a brief summary of what you expect to testify about today?

A. Yes. I expect to cover three main areas, quantum of the domestic investment of the BLA product, the significance of those investments, both quantitative and from a qualitative standpoint, and a short discussion about bond, economic reasonableness surrounding bond.

MR. SEARS: Your Honor, at this time we are going to be moving into Shoals confidential material.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Let's move back to the public record.

CROSS-EXAMINATION

BY MR. COYLE:

Q. Your Honor, Jordan Coyle for Voltage again. Good afternoon now, Mr. Nelson. How are you?

A. Good afternoon, Mr. Coyle. I'm well. Thank you.

Q. Good. A little bit different weather today from that January snowy day in Salt Lake.

A. Slightly different.

Q. I understand this is the first time you're testifying in the ITC.

A. That's correct, yes.

Q. And before this investigation you had issued a report in one other ITC investigation?

A. Yes, that's correct.

Q. You've supported other testifying experts in about two to four other investigations?

A. Something on that order of magnitude, I suspect.

Q. We just mentioned the fact that I deposed you in this matter, correct?

A. Yes, that's correct.

Q. And on the morning of your deposition you served an errata with 15 revisions to your report and three

corrective schedules, right?

A. I think that's fair.

Q. Mr. Brooks, I don't want you to put this on the screen, because we're going to stay on the confidential [sic] record.

But if you could just flip in your binder to JX-193, please. It's the cross binder?

Is that the errata that you served the morning of your deposition, sir?

A. It is the errata sheet, yes, that describes some updates to schedules, for example, where a schedule number was misnumbered, for lack of a better word.

Q. Thank you. You can close that, if you'd like. We're not going to look at that anymore.

You're not offering technical opinions in this matter, are you?

A. It's not my intent, no.

Q. You're not opining on whether any Shoals product practices any asserted claim?

A. That's fair.

Q. You're relying on Dr. Brooks' opinions for that aspect of domestic industry, right?

A. Yeah, it's an assumption I've made, as I would in any case of liability, of infringement, if you will.

Q. As of your deposition you had spoken to

Dr. Brooks one time, right?

A. That sounds correct.

Q. And that conversation lasted about an hour?

A. That also sounds fair.

Q. During that conversation, Mr. Brooks never identified to you any specific BLA products that practice the '153 patent, did he?

A. I think we talked about the BLA product that practices the '153. That's how I understood his representations to me to be.

Q. So he described BLA products generally. He did not identify any specific BLA products that practice the '153 patent, right?

A. It's been a while since that conversation took place. I don't know that he called them "products" or "the product" in that conversation, but that would make sense to me that he called it "the product" rather than as you're representing "products."

Q. Mr. Brooks, could you pull up JX-215, please?

Page 64, please.

Mr. Nelson, this will be a portion of your deposition testimony. Let me know if I read this correctly.

The question is, did Mr. Brooks ever provide you with an identification of specific BLA products that he believes practice the '254 and '153 patents?

Your answer was, I don't recall discussing product numbers with him.

Did I read that correctly?

A. I believe you did.

MR. COYLE: Your Honor, we would like to go on the confidential record at this point, the Shoals confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Okay. We moved to the public record.

MR. COYLE: We met and conferred over the lunch break, and we've reached a stipulation that resolves the one outstanding issue I thought I may want to return to after launch. So we have agreed on language, and I'm just going to read, if that's okay.

JUDGE BHATTACHARYYA: Okay.

MR. COYLE: So regarding JX-133C, tab RD_EN Summary w %, three employees who had been classified as both R&D and indirect have been reclassified as indirect only. Their names are Sprouse, Hinkle and Pereda. Mr. Nelson did not include these three employees in the R&D labor he testified to today, but he did include them in the indirect labor he testified to today.

Unless there are any questions about that, Your Honor, I've finished may cross-examination and I can pass to Mr. Shin.

JUDGE BHATTACHARYYA: All right.

MR. SEARS: I was just going to confirm that Shoals agrees.

JUDGE BHATTACHARYYA: All right. Thank you.

Mr. Nelson, you don't have anything to add, correct?

THE WITNESS: I do not.

MR. SHIN: Your Honor, I think we should go on the confidential record.

JUDGE BHATTACHARYYA: Shoals confidential record?

MR. SHIN: Yes, Your Honor.

JUDGE BHATTACHARYYA: We're moving to the Shoals confidential.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

MR. OU: Good afternoon, Your Honor. On behalf of Voltage we would like to call our first witness, that is Ms. Ruiyan Ge. She is one of the founders of Voltage.

RUIYAN GE,

having been first duly sworn or affirmed on her oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. OU:

Q. Ms. Ge, could you please introduce yourself to the ALJ?

A. Yes, good afternoon, Your Honor. My name is Ruiyan Ge. I'm one of the cofounders of Voltage.

Q. Can you give a little bit of background of who is Voltage?

A. Voltage is based in Chapel Hill, North Carolina, and we are specializing in providing wiring solutions to the solar industry.

Q. What are some examples of the EBOS solutions that Voltage provides to its customers in the United States?

A. For example, we provide photovoltaic cables, medium photovoltaic cables, wiring harness, Alex and LYNX systems.

Q. And do you have a video that you'd like to play for the Judge just to provide some more background?

A. Yeah. I have prepared a short clip from our 3D simulations. Can I play the video?

(Video clip played.)

A. So we use our 3D simulations to simulate on the solar site, and we try to capture all the details about the solar farm. For example, like which brands of modules will be used with trackers and how the wires will be managed on the site.

So as we can see from the screen, the blue things are the solar panels that we have been discussing about. And the bigger box, the white box on the behind is an inverter.

So underneath the solar panels is the tracker system. It's supposed to rotate and track the sun. So as we zoom into the smaller white box in the middle, there is a disconnect box. Eventually it will be connected to an inverter.

So falling from the disconnect box we can see our LYNX product placed on the messenger wire system. So this bigger component in the middle is our LYNX Trunk Bus. And when we follow the branch, we do not see an Alex --

(Clarification requested by the court reporter.)

A. -- Alex component. And then we have the LYNX connected directly to a solar panel from a solar string.

Q. And, Ms. Ge, why does Voltage make these 3D video

renderings like the one you just showed?

A. Well, because the solar farms we provide to are usually very large scale and sometimes can be very complicated. That is why accurate wire footage calculations is very important. Of course, if the wire came too short, then they cannot make a connection on the site.

So the industry practice is to add like five to ten extra, or 10 percent extra, to each section of the cable. Those additional cables, you know, it's not only a waste of material, but also because cable has resistance. So the longer the cable is, the more power will be lost during the transmission.

That is why we choose to use 3D simulation trying to capture all the details and come up with the most accurate wire footage takeoffs.

Q. And does Voltage also use 3D renderings to help with the actual installation process?

A. Yeah. So another challenge that we are facing in the industry is solar is growing so fast, so we are short of experienced laborers, experienced installers. It's quite often the solar crew that comes to a solar site never been to a farm before, and they don't know what to expect and they do not know how to install our products.

So we use our 3D simulation to help them visualize how a solar farm works and how to install products

so that they can reduce the chance of making mistakes.

Q. And what are some other ways that Voltage differentiates its solution from others in the market?

A. Well, besides the 3D simulation, we also provide VR programs to help our customers train their employees, train their engineers, and train their solar site crews.

Q. And did you say VR? Is that virtual reality?

A. Yes.

Q. Anything else?

A. Well, we have a very large and dedicated engineering team. So our mission is to find the best solution for customer on the very specific site. So it is quite often that we come up with different solutions for one site at different stage of the lifespan.

It's quite -- it's requiring our company actually to provide one solution matching with what customer needs and to provide another solution, which we think provides better value in terms of cost efficiency or installation efficiency or voltage drop calculations.

Q. And so sometimes does a customer end up changing the actual project site based on the consulting and different options that Voltage prepares for the customer through this technology?

A. Yes.

MR. BARQUIST: Objection, leading, Your Honor.

JUDGE BHATTACHARYYA: The objection is overruled.

Q. So next, Ms. Ge, could you introduce the Judge to how you got involved in solar and also how it came to be, Voltage as a company, how did that happen?

A. So after graduation from Wake Forest University in 2012, I started my career in the solar industry. I was working for a company called Renesola. It was a public company providing solar panels globally. So I was one of the salesperson developing the U.S. market.

Within that experience I gained knowledge about the solar industry and more so got connected with the EPCs, engineering procurement construction firms, and also the developers.

So around the similar time our other cofounder, Mr. Li Wang, he was working with cable manufacturers, providing cables, cable assemblies globally. So by combining his expertise in the cable assembly industry and my knowledge, my connections in the solar industry, so we figured, you know, there was an opportunity for us to provide cables to the solar industry.

Q. Okay. So Voltage forms Voltage LLC, the company, and then starts distributing cables in the U.S. for solar?

A. Yes.

MR. BARQUIST: Objection, leading, Your Honor.

MR. OU: Your Honor, I just summarized her last

testimony.

JUDGE BHATTACHARYYA: I agree. The objection is overruled.

Q. Ms. Ge, then what happens next in terms of Voltage's product development?

A. So while we were promoting cables to the solar industry, we had a customer approach us, and asked us if we can find harness vendors for them. So at that time it was around 2016. Harness was quite popular in the solar industry. So it was very easy for us to locate a few harness suppliers for them.

Q. Okay. And then what happens next in terms of Voltage's product development?

A. So, as I mentioned earlier, since I was selling modules, solar panel, I always pay attention to the new technology with solar panels. So around 2018 we saw a trend, right, the modules are getting bigger, coming with higher wattage, which can generate more power, more current.

So we realized our 16-harness solution was not sufficient enough to handle that issue. So we talked to one of our cable manufacturers who has experience manufacturing Trunk Bus for other industries.

So we figured it was possible to apply Trunk Bus to the solar industry.

Q. Can you just give a few examples of where a Trunk

Bus has been used in other industries?

A. I think they were selling to, for example, elevator applications, commercial buildings, residential buildings, airports, tunnels. There were a lot of applications.

Q. Okay. And then what happens next?

A. So we developed the prototypes for Trunk Bus, and we exhibited on the conference called SPI, short for Solar Power International, in 2019.

Q. Okay. And at that -- was that Voltage's first conference, solar conference, where it exhibited its own products?

A. Yes.

Q. Okay. And what else did Voltage exhibit at that SPI conference?

A. Well, we also displayed photovoltaic cables, medium-voltage cables, our wire harness, and a few Trunk Bus prototypes.

Q. And then after that conference what happened in terms of Voltage's product development?

A. So the vendor that we were working with, they were very focused on getting the harness UL listed. Of course they have other business. So they were kind of slow getting the Trunk Bus UL listed.

So, but around late 2020, we saw the trend, and

we think we couldn't wait any longer. So we decided to develop our own product.

Q. And did Voltage do some further research and development design and then also get into manufacturing?

A. Yes. So we started to design our products around late 2020, and in about March, April 2021 we finished our design, and we started to build our own manufacturing facility.

Q. And that manufacturing facility, that's the other Respondent, Ningbo Voltage Smart Production Co.?

A. Yes.

Q. And in that process did Voltage -- it came up with its design. Did it also come up with manufacturing processes related to the factory?

A. Yes.

Q. And when Voltage does that, does Voltage look to protect its innovations?

A. Yeah. We value innovations and we respect IP. We, of course, definitely do not want to infringe others' patents. At the same time we try to file a patent to protect our ideas.

Q. Did Voltage do that in this case?

A. Yes. So after our design was finalized in early 2021, we asked our patent agent in China to search -- to run a search to see if our idea was covered by another patent,

and also we can file patent to protect our idea.

So that's when he came across Shoals' '254 patent, which was just issued a month ago.

Q. And when you say Shoals' '254 patent, that's the other patent that was originally asserted in this investigation that's no longer at issue?

A. Yes.

Q. And what happened next?

A. So since that patent was a U.S. Patent and we didn't have much knowledge about the U.S. Patent system, so we went to our corporate counsel in the U.S., and he put us in touch with U.S. Patent lawyer.

Q. And I don't want to get into details of any opinions of counsel, but can you generally describe what happened next with Voltage's Trunk Bus design?

A. So of course we took an opinion from that patent lawyer, and while we are not patent experts, but I looked at that patent, the Shoals '254 patent. So my understanding was it required branch cable to be parallel with the main trunk cable, which was quite similar to the other applications, you know, Trunk Bus applications that we have seen in other industries.

So we feel like our design was different, and that's why we brought up to our patent lawyer, and then he was -- it was up to him to decide whether or not to file a

patent.

Q. And going forward has Voltage continued to invest in research and development and come up with different technologies?

A. Yes, absolutely. We value innovations, and we respect IP. We have about 60 engineers, which is around 20 percent of our overall headcount. So we invest heavily in innovation and R&D.

MR. OU: Your Honor, can we go on the Voltage confidential record now?

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving to the public record.

MR. OU: You can take that down, please.

BY MR. OU:

Q. Just a few more questions, okay?

You were here during openings. You heard how before this investigation was filed Shoals had obtained a Voltage LYNX Trunk Bus to cut open and look at and then put in the complaint?

A. Yes.

Q. Okay. Has Voltage ever obtained a Shoals BLA product?

A. No, we have never.

Q. So Voltage has never been -- they have never reverse-engineered a BLA product?

A. No, never.

MR. BARQUIST: Objection, leading.

JUDGE BHATTACHARYYA: Sustained.

Q. Has Voltage ever reverse-engineered a BLA product?

A. No, we have never.

Q. Has Voltage ever done a teardown analysis of a BLA product?

A. No.

Q. Has Voltage ever done an analysis to determine what materials Shoals uses to make its undermold or overmold?

A. No.

Q. Has Voltage ever done an analysis of Shoals' BLA product to determine how it protects its electrical connection area?

A. No, we have no idea.

Q. Did Voltage develop its own Trunk Bus on its own?

A. Yes.

Q. Ms. Ge, you testified that you had worked at Renesola from 2012 to 2014 time period, true?

A. Yes.

Q. You're not familiar with the invalidity reports that were disclosed, like, you haven't reviewed Dr. Kenny's invalidity report or Mr. Weiner's invalidity report?

A. No.

Q. From your experience working at Renesola, did you learn -- did you gain knowledge about the solar market in Japan in the 2012 to 2014 time period?

A. Yeah, I have some idea.

Q. Okay. And can you explain for the Judge why you gained some of that information?

A. Well, that was when I first started my career in the solar industry. So I did some market analysis, market

research, about a global market. So that's how also in the same office we have knowledgeable sales managers for the Japanese market and sales managers for the European market. So I gained some knowledge about different markets through the conversations with them.

Q. And can you just very briefly give the judge some background as to what was happening in Japan in solar in 2012-2014 time frame?

A. So after the Fukushima nuclear crisis happened in Japan in 2011, Japanese government decided to invest a lot in the renewable energy industry. So they introduced a program called Feed-In Tariff in 2012. And that program allowed the Japanese, the government, to purchase the solar power generated -- well, the power generated by solar farms at a certain price.

So at the time the price was very attractive. So that basically led to a boom in Japanese solar industry, especially the larger scale solar farms.

Q. Okay. So the utility solar installations, in your experience, were those occurring in Japan in that time period?

A. Yeah. To my memory, I think Japan -- well, in 2013-2014, Japan was the second largest solar market globally, and it was even bigger than the U.S. market.

Q. So from your experience, the fact that Japan has

smaller -- is a -- is a smaller country in terms of size than the United States and it has lots of mountains, did that have any impact on Japan's ability to develop the solar market?

A. No. I have seen -- I mean, quite a few solar farms are built on mountains. And as of today Japan is still the third largest market globally.

Q. Thank you, Ms. Ge.

MR. OU: Pass the witness.

MR. BARQUIST: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may. We're on the public record.

CROSS-EXAMINATION

BY MR. BARQUIST:

Q. Good afternoon, Ms. Ge.

Do you recall I took your deposition back in December?

A. Yes.

Q. And you were under oath at that time.

Do you recall that?

A. Yes.

Q. And since your deposition you've had a chance to read the transcript, correct?

A. Yes.

Q. And you were able to make changes, if you had

any?

A. (Nodding head up and down.)

Q. And you did, in fact, make changes to your deposition, you corrected a few typographical and transcription errors; is that right?

A. I think so.

Q. Now you showed us two videos this afternoon.

Are those videos that you actually provide to customers?

A. Yes.

Q. So can you tell me why the second one was confidential?

A. The second one?

Q. The second one. We've been on the confidential record. What was confidential about it if you show it to customers?

A. Well, we only show it to a few very select customers, and we also have confidential agreement with our customers.

Q. So you're representing to the Court you have confidentiality agreements with the customers that you provide the video to?

A. Well, in general, when we start working with a customer, we have NDA, and the confidential agreement, and that usually covers our products, our designs, and other,

you know, information that gets exchanged.

Q. Is there any limitation you put on your customers about who they can show that video to? Do they show it to all of the workmen who are on the site?

MR. OU: Objection, Your Honor. I don't understand what is the relevance of this examination. If Mr. Barquist wants to later de-designate the portion of Ms. Ge's testimony where she briefly describes the VR video that was shown --

JUDGE BHATTACHARYYA: Mr. Barquist, can you explain briefly?

MR. BARQUIST: I'd like the video to be de-designated, Your Honor, and I'm trying to establish that.

JUDGE BHATTACHARYYA: All right.

MR. OU: Okay. No objection if he wants to continue with this line of questioning and use up time. Go ahead.

Q. Do you put any limitations on your customers about who they can show the VR video to? Can they show it to all of the dozens or scores of workmen who are installing the cables on the site?

A. I think at the beginning of the VR I just showed there is a confidential paragraph. So I didn't read the whole thing. But I assume that is supposed, you know, tell all customers this VR program is confidential.

Q. That doesn't answer my question, Ms. Ge.

Do you put any restrictions on the ability of your customer to show it to all the people who are actually going to be installing the cables on the solar site so that they can, as the video indicates, they can know how it's done?

A. Well, I think it's confidential. I don't -- I don't remember the very details of our NDA and the confidential agreement anymore, so I may have to review it to answer your question.

Q. So we mentioned the patent that you applied for. Let's put up on the screen, if we could, Exhibit CX-349.

Do you recognize CX-349 as the patent application that you and your cofounder have filed?

A. Would you please flip it?

Q. Let me direct your attention to page 14.

Is that your signature at the bottom of the page?

A. Yes.

Q. And looking at the -- higher up on the page, do you see that it says, Title of Invention, Trunk Bus System?

A. Yes.

Q. And that is your invention, correct?

A. I think so.

Q. And you represented to the United States Patent and Trademark Office that you believed you had a new and

novel invention that was described in this application, correct?

A. Yeah. We brought this design to our patent lawyer, and they put together this patent filing application.

Q. You represented to the Patent Office that you believed you had invented something new and novel over the prior art, correct?

A. Well, I think there was some benefits with our design, so, as I said, we brought it to our patent lawyer's attention. It was kind of up to him to decide, you know, whether or not we can file patent or not.

Q. Well, you believed you had a new invention, correct?

A. Yeah, we believed we have -- we made -- we have something new and something benefits with our design.

Q. And those benefits including being able to get rid of combiner boxes, correct?

A. Well, that is a benefit with using Trunk Bus, but not necessary.

Q. It is a benefit of using the Trunk Bus that your company sells, correct?

A. Yeah, it is one of the benefits.

Q. It's one of the benefits of the invention that you claim to have come up with and put in this patent

application, correct?

A. Yeah, I believe we filed a patent with the intention to cover our Trunk Bus design.

Q. Turn back to page 6 of the patent application, CX-349. This provides inventor information.

Again, you see your name there, right, Ms. Ge?

A. Yes, I do.

Q. And an address in Chapel Hill, North Carolina.

Do you see that?

A. Yes.

Q. Is that where you resided in May of 2022?

A. Well, I have a house in Chapel Hill.

Q. That's not my question. Is Chapel Hill, North Carolina, where you resided in May of 2022?

A. Yeah, I'm not sure what you mean by reside. But when I'm in the U.S. I stay with that house.

Q. Well, let's look down on the page. Where it says residence information, it indicates U.S. residency.

Do you see that?

A. Yes.

Q. Were you a resident of the United States in May of 2022, yes or no?

A. I don't think so.

Q. You don't think so.

A. No, I'm not. I was not.

Q. But you represented to the U.S. government that you were; isn't that right?

A. Well, we send this -- we sent our information to our patent lawyers. He probably didn't know, you know, my nationality, so, yeah.

Q. Well, you signed this application, correct?

A. I did.

Q. You signed it under penalty of perjury, correct?

A. I did.

Q. Is everything in the application correct, including the statement of where you resided?

A. Well, I reviewed the documents. I didn't pay attention to this specific issue. So I think that's how it happened.

Q. You didn't pay attention to what you were representing was true to the United States government; is that correct?

A. No, I didn't pay attention to the residency information, whether U.S. residency or non-U.S. When we filed the patent, I'm still Chinese citizen, so that's my nationality.

Q. Let's turn to page 21 of Exhibit CX-349.

In the paragraph number 1, the last sentence reads, more particularly, in some embodiments, the present disclosure relates to a Trunk Bus system that may enable

better connection of one or more solar panels to an inverter or other electrical component.

Is that what your invention does?

A. I think our invention was to have a Trunk Bus --

Q. Does your invention enable better connection of one or more solar panels to an inverter or other electrical component, yes or no?

A. Reading this right now, I agree.

Q. And how does it do that? How does it enable a better connection?

A. Well, this patent was filed a long time ago. I don't really remember much content about it anymore. So if you want me to guess what's behind it, I can try to.

Q. I don't want you to guess. Let's look at the next page, page 22.

Here in the -- in paragraph 4 it states, about six lines down, combiner boxes installed on site malfunction often, requiring additional intensive maintenance.

Do you see that?

A. I'm sorry. I'm not following.

Q. Paragraph 4, as highlighted here, do you see the sentence, it says, combiner boxes installed on site malfunction often, requiring additional intensive maintenance.

A. Yeah, I see that.

Q. And you would agree with me that you heard from clients at that time that combiner boxes were, in fact, malfunctioning, right?

A. Yeah. From our conversations with our customers, we heard customers complaining about, you know, combiner box malfunctioning, and they have to go back and fix it.

Q. And so the LYNX Trunk Bus that is covered by your patent, according to you, can eliminate the combiner box in the solar system, correct?

A. To some extent.

Q. Now looking at the next paragraph, paragraph 5 on page 21, it says, previously, certain "truck busses" have been utilized that employee a parallel structure.

That's a reference to the Shoals Trunk Bus, correct?

A. Well, I think everyone talks about that too, the parallel thing, and the other applications that we have been seeing in the Trunk Bus were used in different industries, they all have that, you know, the branch wire being parallel with the trunk.

Q. Do you recall testifying that you were referring to the Shoals patent when you referred to previously certain Trunk Buses have been utilized to employ a parallel structure?

A. Yeah, it shows patent was definitely one of

those.

Q. Excuse me?

A. The patent was one of those.

Q. That's the one you were referring to, not just one of them. That's the one you were referring to, correct?

A. Well, when we talked to our patent lawyers, we brought -- well, of course we brought to him attention about the Shoals '254 patent, and we told him other applications that we have been seeing, so he put those language together.

Q. All right. Let's go to your deposition, please, at page 25, beginning at line 9.

You were asked, paragraph 5, the first sentence says, previously certain Trunk Buses have been utilized that employ a parallel structure.

Do you see that?

Answer. Yes.

Further down on the page, you were asked, beginning at line 14:

What Trunk Buses were you referring to in that statement?

I think we came across a patent, so we brought that patent to our counsel's attention.

Next question.

And what patent was that?

Answer. As of today, I think I understand it is

the Shoals patent.

So it was the Shoals patent you were referring to, correct?

A. Yeah. Shoals patent was, of course, one of the applications that we have seen.

Q. Well, that is the specific one you were referring to. Not just one of many, but that is the one, correct?

A. That's the one patent, yes.

Q. Now going back to page 2 of the application, CX-349, page 2, you actually cited the Shoals patent in your application.

Do you see that?

A. Yes.

Q. The '254 patent.

A. Yes.

Q. And that's, in fact, the only patent that you cited in your application, correct?

A. I --

Q. Look at the entire page, page 2, that's the only one listed.

A. Yes.

Q. So you mentioned in your testimony lots of other Trunk Buses, but the only one that you actually cited for the Patent Office was the Shoals patent, correct?

A. Well, we have seen a lot of applications. I

don't know if they filed a patent or not. But the only patent that we were aware of was the Shoals '254 patent. The applications were out there.

Q. The only one you cited as prior art in your application is the Shoals patent, correct?

A. Yes.

Q. Now let's look at the provisional patent. That was filed a year earlier in July of 2021, July 22.

Do you recall that?

Let's bring up CX-350, please.

Do you recognize CX-350 as your provisional application for a patent on a Trunk Bus system?

A. I think so.

Q. Okay. And turn to page 2.

Do you see the date there, July 22, 2021?

A. Yes.

Q. Now if we go to page 10 of the exhibit, paragraph 5, we see that same language about previously, certain Trunk Buses have been utilized that employ a parallel structure.

Do you see that?

A. I do.

Q. And there's a reference to Fig. 1 below.

Do you see that?

A. Yes.

Q. Turn to the next page, page 11, is that Fig. 1?

Do you see Fig. 1 is described as junction and mold (undermold and overmold) of present product? Do you see that?

A. Yes.

Q. And the present product is the Shoals Big Lead Assembly or BLA product, correct?

A. I don't know how Shoals BLA is, so I cannot speak for that.

Q. You don't know where you got the Fig. 1 that you reproduced in your patent -- provisional patent application, correct?

A. I can't remember.

Q. But Fig. 1 is a representation of this so-called parallel structure you've mentioned, correct?

A. I think that's the intention.

Q. And so you knew at the time you filed your provisional patent application in July of 2021, that the so-called present product had 90-degree bends in the branches, right?

A. Yeah, I think that's some language from our patent.

Q. Now if we go to page 12 of the application, please.

Here you illustrate how each joint may have one to six strings/branches, though more strings/branches are

possible, correct?

A. I think so.

Q. The reference to strings/branches is a reference to the smaller wires or smaller cables we see in the figures here on page 12 of CX-350, correct?

A. Yeah, I think those are the branches of the Trunk Bus.

Q. And those small wires that are called branches can also be called drop lines, correct?

A. Well, in our daily business we don't -- we don't call that drop line.

Q. Let's bring up page 38 from your deposition, please, at line 22. Page 38.

During your deposition were you asked this question and did you give this answer:

"And are those branches sometimes called drop lines?

"Answer. These branches?

"Question. Yes.

"Answer. Yeah, we can call them drop lines."

Did you give that answer to those questions?

A. Well, under the circumstances, I think --

Q. Ms. Ge, did you give that answer, yes or no?

A. Yes.

Q. So you agree we can call these branches or

strings drop lines, correct?

A. Well, we never used the drop lines term --

Q. Do you agree as you testified in your deposition that we can call the branches or strings off of a Trunk Bus drop lines?

A. Under the context, I can understand.

Q. And you would agree that the purpose of a drop line is to transmit electricity from the solar panel to the Trunk Bus, correct?

A. Well, the branches are going to be connected to solar panels on the string to collect the energy from the panel and then transmit to the inverter and to the grid.

Q. And the drop line is to transmit electricity from the solar panel to the Trunk Bus, correct?

A. The branches?

Q. The branches or drop lines are to transmit electricity from the solar panel to the Trunk Bus, yes or no?

A. I think that's the purpose.

Q. Mr. Ou asked you about a sample that you saw at your deposition. I'm going to show you CPX-40.

May I approach, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may.

Q. Is CPX-40 a Voltage LYNX Trunk Bus?

A. I think in my deposition I also recognized there

is a missing part in between.

Q. Yes.

A. It is not complete product.

Q. This one was cut open. Other than the fact there may be a missing piece between the two cut pieces, that is a LYNX Trunk Bus, correct?

A. Yeah, I can recognize it.

Q. And that CPX-40 has connectors at the end of the drop lines, correct?

A. Yeah, there are connectors at the end of the branches.

Q. Now you agree that in order to sell the LYNX Trunk Bus it must be certified to UL standards, correct?

A. Yeah.

Q. And Voltage sends its products to Intertek to get those certifications, correct?

A. Yes, we did.

Q. And Voltage makes several different configurations of a LYNX Trunk Bus, including different numbers of drop lines, different sizes of wires, different sizes of the mold, correct?

A. Yeah. We have different configurations based on different main trunk cable size, and different numbers of branches.

Q. And when you seek certification from Intertek,

Intertek requests representative configurations to test, correct?

A. Intertek sends over a list of samples that we had to produce and send to them for testing.

Q. Intertek requests representative samples, correct?

A. What do you mean by representative? Sorry.

Q. Let's bring up from your deposition page 126, line 23.

Were you asked this question and did you give this answer:

Question. Right. And the representative sample that you sent to Intertek for testing covers all of those different configurations, correct?

Answer. Intertek has a different approach. They don't ask for all different configurations. They select a few representative configurations.

Did you give that answer at your deposition?

A. I did. I think it was under some circumstance --

Q. Ms. Ge, that's all I need.

And you agree that all -- all -- of the LYNX Trunk Bus configurations that Voltage sells in the U.S. are covered by the Intertek certifications, correct?

A. I think so.

Q. And Voltage does in fact, at Intertek's request,

send representative LYNX Trunk Bus samples to Intertek for testing, correct?

A. I'm sorry. Can you repeat that, please?

Q. Voltage does in fact send representative samples of the LYNX Trunk Bus to Intertek for testing, correct?

A. Yeah, we send a few samples, a list of samples that they requested.

Q. And they are representative samples, correct?

A. It really depends on what you mean as far as they request a few samples, and they have their own way to designate what samples were needed. So we have different molds, and for each mold, you know, they request some samples.

Q. And you send representative samples to Intertek at their request for testing, correct?

A. Depends on the context.

Q. All right. Let me bring up again your deposition, page 129.

Did you give this answer in response to this question:

Question. So okay. So they are covered by the certification which allows you to put the ETL label on all versions of the LYNX -- of the Trunk Bus system based on the representative product, correct?

Answer. Yeah. So we -- we send a few

representative samples to Intertek for testing, and they allow us to put ETL label on the products that we offer to the U.S. market.

Did you give that answer?

MR. OU: Objection, Your Honor.

JUDGE BHATTACHARYYA: What's the objection?

MR. OU: This is improper impeachment.

Objection, Your Honor. This is improper impeachment. Mr. Barquist knows he needs to ask a question, and if he asks the same question in the deposition and she gives a different answer, he can impeach her. Mr. Barquist is just trying to posturize deposition testimony from Ms. Ge. And Ms. Ge has been deposed. They have asked to submit her deposition testimony into the evidentiary record. We haven't objected. He is not conducting an examination properly. That's the objection, Your Honor.

JUDGE BHATTACHARYYA: The objection is overruled.

Q. By the way, Ms. Ge, the Trunk Bus, CPX-40, that I showed you, is there a reason why that doesn't say "Made in China" on it?

A. Sorry. It does not?

Q. Is there a reason why your LYNX Trunk Bus product does not say "Made in China"?

A. There is a label on the box. So the label on the box says it is made in China.

Q. So is there a reason why the product itself doesn't say "Made in China"?

A. I don't think it's required.

MR. BARQUIST: Your Honor, at this point I think I'd like to go on the Voltage confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

BY MR. OU:

Q. Ms. Ge, earlier Mr. Barquist wanted you to equate branches to drop lines, and he showed you some deposition testimony where he asked you about branches and drop lines.

Can you explain to the Court why context matters, at least from your perspective, in terms of if a branch is the same as a drop line?

A. Well, we, in business, we do not really use the term drop line. This term was brought to me by this case. So I think when he was deposing me I understand that he was referring to the branches.

Q. Okay. For example, if a customer were to ask you and were talking about a product and said, we want two drop lines or four drop lines, can you explain why that -- how you could potentially interpret that question?

A. I'll have to check with our customers, I think. Of course, drop line is not a term that we normally use. Line usually means a wire or a cable to me. So I will ask the customer if they mean like two branches or four branches or eight branches from the wires.

Q. Mr. Barquist asked you about the Intertek Report, and he asked you whether or not the samples that were sent were representative. And I think you also said it depends what do you mean by representative.

Can you explain to the ALJ what you were trying to explain that Mr. Barquist didn't let you explain?

A. I did not read it very carefully about the report. I think my understanding about representative was Intertek is not able to test every single piece of the product that we produced.

So we sent samples to their lab so that they can test those samples. And they, Intertek, I mean, assumed that we produce our future shipments the same way as we produce for the samples. So in that context I think that was representative of our future shipments.

Q. And what are the types of things that Intertek tests for?

A. Well, there's a good list. For example, crush test, pull test, dielectric test, leakage current test, current overload test, like humidity cycling test, temperature cycling test, a bunch of them.

Q. Okay. Are you aware of any testing or analysis that Intertek does of those product samples to determine whether or not they are representative of whether or not Voltage's products meet or do not meet the limitations of any patent?

A. Yeah, patent was not -- I don't think patent was Intertek's concern.

Q. Or the structures of the inner mold material?

A. Sorry. The structure of?

Q. Sure. Does Intertek do any analysis to determine whether or not the structures of the mold material have the same structure?

A. Well, we have to -- we have to tell Intertek how many mold configurations that we are using. So, for example, we use mold to manufacture, let's say, from 250MCM to 500MCM.

Intertek they usually request the smallest and largest of products produced by that mold. But if we change or use a different mode to produce, for example, 600 to 800, and Intertek requests the smallest and the largest, and they skip the middle, like 750, you know, they skip those samples.

Q. Last question. Mr. Barquist asked you whether or not Voltage marks its products "Made in China" on the product, and I think you said it's marked on the box, right?

A. Yeah. There is a label on the box underneath it, it says "Made in China."

Q. But not on the product, right?

A. I don't think so.

Q. Okay. Do you have an iPhone?

A. iPhone? I do.

Q. Okay. I have an iPhone too. I think many do. The iPhone is made in China, right?

A. I think so.

Q. Do you see anywhere on your iPhone where Apple marks that its iPhone is made in China?

A. It only has this Apple logo.

Q. Okay. That marking is on the box, right?

A. Yes.

Q. Okay.

MR. OU: No further questions.

RECROSS-EXAMINATION

BY MR. BARQUIST:

Q. Ms. Ge, it's important that you produce your products in the same way and to the same standards of quality and structure as the products that Intertek tests and allows you to certify as approved under the UL standard, correct?

A. I think so, yes.

MR. BARQUIST: Your Honor, I'm afraid we'll have to go on Voltage confidential record for another question or two.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

MR. BARQUIST: Your Honor, as indicated earlier, at this point Shoals will rest its case, our case-in-chief.

MR. COYLE: Good afternoon, Your Honor. Jordan Coyle for Voltage. We will be calling our next witness, Mr. Andrew Clarke.

Our NEXT advocate is going to put on Mr. Clarke. This is Brady Schoenlein, and we thank you for the opportunity to utilize the NEXT Advocates Program, and we thank our client for the trust in White & Case and in Your Honor for this opportunity. Thank you.

MS. SCHOENLEIN: Good afternoon, Your Honor. Go easy on me. Thank you.

Your Honor, Voltage calls Andrew Clarke to the stand.

ANDREW CLARKE,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MS. SCHOENLEIN:

Q. Good afternoon. Will you please state your name for the record?

A. Yes. It's Andrew Clarke.

Q. Mr. Clarke, what is your role in this investigation?

A. So I was asked by Respondents to review and respond to the opinions offered by Mr. Clarke Nelson, Shoals' economic expert, specifically his opinions related to the economic prong of domestic industry and bond.

Q. Where do you work?

A. I am a vice president at Analysis Group.

Q. Mr. Clarke, what do you see on the screens around the courtroom?

A. So these are the demonstratives that I prepared to aid in my testimony today.

Q. And turning to slide 1, what are we looking at here?

A. So this is a summary of my experience and education based on my CV, JX-324.

Q. Will you describe your education for the Court?

A. Sure. I received a bachelor's in economics from Swarthmore College and then several years after that an MBA from New York University with specializations in finance and law and business.

Q. Do you have any certifications within your field?

A. Yes. I've also earned the right to use the Chartered Financial Analyst designation or CFA.

Q. And how long have you been providing economic consulting services to clients?

A. More than 20 years at this point.

Q. Have you ever been retained as an expert witness in the field of economics?

A. Yes, I have, and provided testimony both at deposition and in evidentiary hearings here at the ITC.

Q. And in how many section 337 investigations have you been involved?

A. So over the course of my career now it's more than 40.

MS. SCHOENLEIN: Your Honor, at this time we tender Mr. Clarke as an expert in the field of economics, including economic issues at the ITC, such as domestic industry and remedy.

JUDGE BHATTACHARYYA: Any objection?

MR. SEARS: No objection, Your Honor.

MR. SHIN: No objection from the Staff, Your Honor.

JUDGE BHATTACHARYYA: At this time Mr. Clarke is admitted as an expert in the field of economics, including economic issues at the ITC, such as domestic industry and remedy.

BY MS. SCHOENLEIN:

Q. Mr. Clarke, did you prepare a report in this investigation?

A. I did, in January of this year.

Q. And turning to slide 2, what do we see here?

A. This is just an example of some of the materials that I reviewed in forming my opinions here. The summary is based on JX-325, which was the exhibit I prepared and attached to my expert report with a full list of the materials considered.

Q. Have you reviewed any additional information since your deposition?

A. I have. The deposition testimony of Mr. Nelson, as well as the MSD on economic prong, and the filings and the orders following from that. In addition, the parties' pre-hearing briefs.

Q. And have you been in court all week?

A. I have, yes.

Q. Have your opinions related to the economic prong changed since your initial report?

A. So, no, at a high level, they haven't. Some of the opinions and numbers that Mr. Nelson has offered have changed over the time, but at a high level the opinions -- my opinions are still the same.

MS. SCHOENLEIN: Your Honor, at this time I'd like to go on Shoals' confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Move back to the public record.

CROSS-EXAMINATION

BY MR. SEARS:

Q. Good afternoon, Mr. Clarke.

A. Good afternoon.

Q. So in 2022 a bunch of American workers in Portland, Tennessee made 35,000 BLA products that were sold for $66 million.

Are you here to tell our judge that there is not a domestic industry with regard to those products?

A. So I don't think that I've said that or offered that opinion. I believe --

Q. Okay.

A. I believe what I've said is that --

Q. I'm good. Thank you.

Now you also were talking about how one of Mr. Nelson's calculations would have been more appropriate if he were comparing manufacturing costs in the U.S. versus manufacturing costs abroad. Do you recall that?

A. I believe I spoke to his value-add analysis, if that's what you're referring to.

Q. Yes. And isn't it true that the reason we can't do a comparison of American manufacturing costs with foreign

manufacturing costs in this case is because all of the manufacturing costs are American and there are no foreign manufacturing costs?

A. I don't know that I can necessarily agree with that. I think Mr. Nelson excluded certain material costs out of his analysis.

Q. Have you identified any foreign Shoals investment in manufacturing for the BLAs?

A. I believe I did not hear testimony --

(Clarification requested by the court reporter.)

A. I don't believe I've heard testimony that suggests Shoals has manufactured the BLA outside the United States.

Q. Okay. So let me ask you my question again.

Have you identified any foreign investment by Shoals in manufacturing of the BLA products?

A. So --

Q. It's a yes or no question, sir.

A. I believe the third answer is that I can't answer a yes or no, and so I think that needs more explanation.

Q. All right. Mr. Beall, could you pull up slide CDX-12.4?

So you were here and you heard Mr. Nelson testify, correct?

A. Yes.

Q. All right. And you heard Mr. Nelson give opinions on each of these topics listed on this slide, right?

A. I did, yes.

Q. With detailed opinions with detailed supporting analysis, correct?

A. I heard him provide his opinions related to these three subjects.

Q. All right. So let's compare what Mr. Nelson did with what you did.

Have you offered any opinion regarding Shoals' quantum domestic investment in the BLA?

A. Going back to one of my first answers in my --

Q. Yes or no, sir? I'm sorry, but I'm short on time.

A. I understand, but I can't answer. I believe that --

Q. Sir --

A. I think it needs more explanation than can be provided in a yes or no.

Q. Have you quantified any Shoals' domestic investment in the manufacture of BLA products, yes or no?

A. Any investment?

Q. Yes.

A. I believe that's Complainant's burden to show in

this investigation.

Q. So going back to my question, have you quantified any of Shoals' domestic investments in manufacturing of BLAs?

A. I've analyzed Mr. Nelson's --

MR. SEARS: Your Honor, object, move to strike as nonresponsive.

JUDGE BHATTACHARYYA: Any response?

MS. SCHOENLEIN: Your Honor, the witness should be permitted to testify to his answer. He doesn't need to be limited.

JUDGE BHATTACHARYYA: I'm going to strike the last question and answer.

You can reask. Please emphasize that you want a yes or no answer.

Please answer yes, no, or I can't answer yes or no.

Q. All right. So, Mr. Clarke, have you quantified any Shoals' domestic investment in manufacturing the BLA products?

A. I don't think I can answer that with a yes or no, as you'd like.

Q. Okay. Have you given your own opinion on whether Shoals' domestic investments in manufacturing the BLA products are significant?

Have you given an opinion as to whether or not those investments are significant?

A. I've given the opinion that the questions related to the significance that Mr. Nelson has identified related to the investments.

Q. All right. Have you given any opinion on the appropriate amount of bond?

A. I believe I have. I don't believe that bond is appropriate in this investigation.

Q. Assuming bond is appropriate, have you, for example, done that price comparison analysis that you were saying Mr. Nelson should have done?

A. I return to my previous answer, which is that the Complainant bears the burden to prove the need for a bond.

Q. All right. Do you have an opinion to offer on whether or not Voltage's LYNX product competes with Shoals' BLA?

A. I think as I've -- as I testified to, there are questions in my mind as to whether or not --

Q. Sir, yes, no, I can't answer.

A. Sorry. I didn't hear that in your question.

Can you repeat the question?

Q. Sure. Do you have an opinion as to whether or not Voltage's LYNX product competes with Shoals' BLA?

A. During the Presidential Review Period --

Q. Sir, yes, no, or I can't answer.
A. Then I can't answer.
Q. Thank you. Basically, your opinion here today has been that Shoals did not meet its burden on those topics, correct?
A. That is one of the opinions I offered, yes.
Q. All right. Isn't it our judge's job to decide whether Shoals has met it burdens?
A. Ultimately, but it's my job to provide evidence that she can take into consideration in forming that opinion, I believe.
Q. Earlier you mentioned EV BLA investments, and you said that Mr. Nelson had backed out some but not others. Do you recall that?
A. I do.
Q. Did you in your report or on your direct examination identify any other -- sorry -- any EV BLA investment that Mr. Nelson had not backed out of his calculation?
A. So we looked at R&D labor, and I believe there are at least included in the R&D labor calculations. I'm happy to explain.
Q. Sorry?
A. I'm happy to explain further, if you'd like.
Q. On your counsel's time would be fine.

And now you pointed out some decreases in Mr. Nelson's calculations over time, right?

A. Identified decreases from his expert report, yes.

Q. All right. And one of the things that Mr. Nelson did between his expert report and today is he shortened the time period for the investments that he considered, correct?

A. For some investments, yes, he did.

Q. All right. And did you quantify the impact of that shortened time period and how much of the change in his numbers relates simply to shortening that time period?

A. Certainly some of it relates to shortening that time period, but shortening that time period I believe is one of the critiques that I raised in my original report, that he is examining a period of time that is excessive when we're looking at --

Q. Thank you. Mr. Beall, could you please pull up slide RDX-15.3?

Sorry. Make that 13.

So, Mr. Clarke, this term here, "warehouse distribution," where did you get that terminology?

A. I have to look at the JX -- I forget the JX number off the top of my head -- but my recollection was that it may be in the underlying data. I understand Mr. -- we heard Mr. --

Q. Sir, I'm just asking where you got that term.

A. I believe it was in the underlying -- the underlying document.

Q. Okay. Mr. Beall, could you please bring up JX-134, the expense allocation support tab, and highlight for us cell D-5.

So the characterization that Shoals gave to that space in its source data is Raw Materials and Finished Good, right?

A. I see those words in cell D-5, yes.

(Whereupon, the hearing proceeded in confidential session.)

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C E R T I F I C A T E

TITLE: IN THE MATTER OF CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1365

HEARING DATE: March 21, 2024

LOCATION: Courtroom B

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: March 22, 2024

Signed:

ss// _____

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// _____

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// _____

UNITED STATES
INTERNATIONAL TRADE COMMISSION

----------x

In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

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OPEN SESSIONS

Pages: 1037 through 1358 (with excerpts)

Place: Washington, D.C.

Date: March 22, 2024

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No. 337-TA-1365

CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

----------x

International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Friday, March 22, 2024

Volume V

The parties met pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

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*** Index appears at end of transcript ***

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: Good morning. Please be seated.

Are there any housekeeping matters that the parties would like to discuss?

And let's go on the public record.

MS. TRINH: Your Honor, we had just one minor housekeeping issue.

We wanted to move up the confidentiality designation on one of our cross-examinations. We wanted to move the transcript -- the designation starts at 1028, line 10, and we were wondering if we can move that up to 1027, line 22, Shoals' confidential record.

JUDGE BHATTACHARYYA: Is there any objection to that?

MR. COYLE: Can we just check and confirm that, Your Honor? I don't think we had an opportunity to look into that yet.

JUDGE BHATTACHARYYA: Okay. Why don't we talk about this later after everyone has had a chance to look at that.

Was that the issue that was discussed yesterday?

MS. TRINH: Yes, it was.

JUDGE BHATTACHARYYA: We should be discussing

page limits or word limits on post-hearing briefs. I don't know if the parties have had a chance to meet and confer on that issue. If they have not, they should.

Why don't we take that up. If you could let me know the status.

MR. BARQUIST: My understanding is we have agreed on 175 pages for post-hearing briefs and 80 pages for reply.

MR. COYLE: That's Voltage's understanding as well.

JUDGE BHATTACHARYYA: That sounds reasonable. This will be the page limit.

MR. CHAIKOVSKY: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, please.

MR. CHAIKOVSKY: Your Honor, Voltage would like to call its next witness, Dr. Cameron.

KIM CAMERON,

having been first duly sworn or affirmed on her oath, was thereafter examined and testified as follows:

MR. CHAIKOVSKY: Your Honor, may I approach?

JUDGE BHATTACHARYYA: Yes.

DIRECT EXAMINATION

BY MR. CHAIKOVSKY:

Q. Good morning. Can you please state your name for the record?

A. Kimberly Cameron.

Q. Who is your employer?
A. ESI, Engineering Systems.
Q. What is your position?
A. I'm a principal engineer at ESI.
Q. And your responsibilities at ESI?
A. So I'm in a mechanics and materials group, so I do engineering products and provide engineering consulting in those areas.
Q. Dr. Cameron, did you prepare any demonstratives to aid your testimony today?
A. Yes, I did.
Q. And those would be RDX-2C, which I just distributed, correct?
A. That's correct.
Q. What are these?
A. I've prepared some slides to kind of help me walk through my testimony today.
Q. If we go to the first slide you prepared, does this summarize your qualifications, Dr. Cameron?
A. Yes, it does.
Q. Can you describe your education for the Court?
A. Sure. So I have an undergraduate degree in mechanical and aerospace engineering from Princeton University with minors in engineering physics, applied and computational mathematics, and materials science and

engineering.

And then I have a Ph.D. in mechanical engineering with minors in materials science and also a master's in mechanical engineering from Stanford University.

Q. And then can you walk me through your professional career?

A. Sure. So after I graduated with a Ph.D., I started working at Exponent, which is another engineering consulting company, until 2011. In 2011 I started working at Engineering Systems, and I'm still there today.

Q. Do you have any certifications or registrations in your field?

A. Sure. I'm a licensed professional engineer, both in mechanical engineering and metallurgy in California, and then I'm also a registered patent agent.

Q. And do you have any solar experience?

A. Yes, I do. So, actually, while I was in undergraduate I worked part-time at a solar startup company, and then just throughout my career I have worked on various projects related to the solar.

Q. What is your role in this investigation?

A. I was asked to -- I think I have a slide for this, but I was asked to look at the Asserted Patents and look at Shoals' products and Voltage's products and determine if there was infringement by Voltage's products or

if Shoals had established a domestic industry.

MR. CHAIKOVSKY: Your Honor, at this time Voltage proffers Dr. Cameron as an expert in mechanical engineering and electrical connectors.

JUDGE BHATTACHARYYA: Any objections?

MR. HARRIS: No objection, Your Honor.

MR. SHIN: No objection, Your Honor.

JUDGE BHATTACHARYYA: At this time Dr. Cameron is admitted as an expert in mechanical engineering and electrical connectors.

Q. If we go to the next slide, can you please provide a summary of your opinions in this case?

A. Sure. So I looked at three sets of products. The first one was Shoals' products, and I came to the conclusion that Shoals doesn't -- has not established that its products practice any claim of the '153 patent, so that there is no domestic industry. And then I looked at the accused Voltage products to come to the conclusion that they do not infringe the asserted claims, and the alternative design Voltage products do not infringe the asserted claims either.

Q. Just for the record, could you identify the asserted claims?

A. Sure. Those are claims 1, 11, 12, 13, 14, 18, 21, 23 and 24.

Q. Okay. And in forming those opinions, did you create a demonstrative here on slide 4 that shows what you analyzed?

A. Yes, I did. So these are some of the things I considered when forming my opinions. So I looked at the asserted patent and its file history. I looked at Shoals' complaints, final infringement contentions and domestic industry contentions. I have looked at Mr. Brooks' expert, report, along with his claim charts. And, again, I have looked at the physical samples, both of Voltage samples and including CT scans that I took of those samples. And I have also reviewed deposition transcripts of Ms. Ge, Mr. Solon and Mr. Brooks.

Q. And you've been here for the hearing this week at least as it relates to all technical matters that relate to your opinions, correct?

A. Yes, I have.

Q. And all the exhibits relating to the materials you considered are on this slide 4?

A. That's correct.

Q. And when we go through your slides, you also list any exhibits you considered on those additional slides, they will be -- we may not read off every one of those exhibits, but they will be on the slides?

A. That's correct. For example, there are things

that aren't on this page. Like obviously I also reviewed the Markman Order and transcript and things like that, but I'll discuss those as they come up.

Q. Okay. So let's transition in talking about the patent-in-suit here, the '153 patent, Dr. Cameron.

You mentioned you reviewed the file history. We're looking at slide 6, RDX-2C.6. You mentioned you reviewed the file.

Can you tell me why that's relevant?

A. It's very important to review the file history when you're analyzing patent claims, because when you kind of want to understand what particular claims mean, you have to look at that in the context of the patent and look at the intrinsic record.

And part of the intrinsic record is the file history, which is the back-and-forth between the applicant and the Examiner.

So I reviewed the file history in this case.

Q. And --

A. Actually, can you stay on that slide for a minute longer?

Another thing I want to point out, I don't know if you can see this, so this is the cover page of the patent, and just to touch on one thing. So here is basically where the initial application in the priority

chain, so the provisional application was filed. So that's September 9th, 2015.

And then up here on the right is when the patent issued, and so that's June 27th of 2023.

I think to put in context my further discussion, this is quite a long time between this initial filing and when they eventually were able to get an issued patent. So that kind of, as I'll explain, kind of makes sense, because they started out with very broad claims, and so there was a lot of back-and-forth and a lot of reductions from the Examiner until they were finally able to get a claim issued in 2023.

Q. Almost eight-plus years of prosecution.

A. That's correct.

Q. Moving on to your next slide, Dr. Cameron, can you explain how the inventor characterized the inventions, really, I guess, at this point, whether it's the '254 patent, no longer in suit, or the '153?

A. Sure. So I'll try to keep this a little brief, because quite a number of witnesses have kind of touched on these concepts already.

But, again, what was known already in the prior art was to take current coming from the panels and combine that current into a larger branch at the wire harness. And now what's being described in the patent is to do another

combination of current, and where you see the green here, and eliminate the combiner box.

But it's kind of important to keep in mind that you are using electrical connectors here to combine current. And this is the same, the same thing here, just at a larger scale. In other words, you have more current being combined here.

Q. And any comments here, Dr. Cameron, on the figure on the bottom?

A. Oh, sure. So the figure on the bottom is showing what's happening inside the connector. So, basically, this is along the green line, the 10 here, you have a bunch of different connections, and they are shown in a cross-section here. So you have the main feeder cable and then you have the drop line.

Q. I want to talk more about the file history, prosecution history of the patent.

Is there any evidence in the prosecution history to show the scalability of prior art wire harnesses?

A. Yes, there is. So as you can see on the left there, this is a Shoals -- basically a Shoals document that was submitted in the initial provisional application. And so this is part of the file history.

And so on the right Shoals explains that, and I'm just going to read it, it's highlighted, this system

utilizes the same under/overmold construction currently deployed in the field today, but on a much larger scale.

So that's kind of talking about that same concept.

Q. And that's talking about the concept with what's on the right?

A. That's correct. So this was also submitted with the provisional application on the right, and this is an example of the joints that Shoals used.

Q. And in that example of the joint or Shoals, we see what is kind of one string or one output, correct, or input?

A. That's correct. And, actually, another thing I wanted to mention while we're on this slide, because I was here during the opening where I heard that the asserted patent really only has to deal with DC currents, but that's wrong.

And we know that both from the provisional application, which right here says, the same topology not only applies to the DC feeders, that can also be implemented into the feeders deployed in AC systems.

And that type of language is actually also repeated in the specification of the asserted patent itself.

Q. If we go to the next slide, how does the provisional application relate to the figures in the issued

patent?

A. So these are more images on the left that I took from what was filed in the provisional application. So as you can see, it says Shoals on the top. This was submitted in the provisional. And this is really where we see what's happening inside the connector. And so it's a little hard to see on this screen, but it is clear in the printout.

So there's a feeder cable that goes all the way through, and then you can see the drop that's coming out on the right.

And this is the only cross-section where you can see what's going on inside the molds that was in the provisional application.

And then I just wanted to briefly touch on the positive and negative harnesses, because another thing that I wanted to clear up about how current is flowing in these different harnesses and in the connectors is -- I was also here for Mr. Brooks' testimony where he was asked about the direction of current flow in these positive and negative harnesses. And he never really answered the question of what happens in the negative harness. He just -- we don't want to talk about electricity, I want to talk about power instead.

But it's important to keep in mind that the direction of the current flow is, of course, different in

the positive and negative harnesses, because you're having to complete the circuit. So you're coming in for the positive harness, but you're actually going out, the current is going out for the negative harness.

And so that's just another example of how, you know, not only does it not matter if you're using it for AC or DC, but the direction also doesn't matter. You can use this connector for current coming in or current coming out.

MR. CHAIKOVSKY: Your Honor, may I approach briefly?

JUDGE BHATTACHARYYA: Yes.

Q. I think you can use this pointer.

A. Okay. Awesome.

Q. That will actually move the slide.

A. Oh, no, sorry. How do I go back? Okay. Got it. That's really easy. Thank you.

Q. Okay. If we actually do go to the next slide, how does the product photos we saw in the provisional relate to these figures?

A. So I just put the three figures I've been talking about on the same slide now. Over on the right, this was the one from the provisional. It shows feeder and drop.

And then that, of course, kind of gets transferred into the actual '153 feeder and drop. And that, of course, looks very similar to what you see in the Shoals

product photo as well.

Q. And so the photo on the left on this slide 10, that's from the provisional application?

A. That's correct. So on the left is the provisional application, and as I note here, this is the only cross-section that you can see of the connector so that you can see what's happening inside the mold.

Q. And what does this tell you about the provisional application, these two images from the provisional, and Fig. 7 from the patent?

A. Yeah. Actually, one more comment I just wanted to make. I also read the transcript of the Markman hearing, and there seemed to be some confusion whether this could be an actual product, because there was no direct contact between the exposed wire and the drop line in an exposed wire and the feeder cable.

This is pretty normal. You, of course, have the conduction on the lug that's electrically connecting the feeder cable on the drop line, and this certainly can be and appears to be an actual product, as you see on the bottom right.

Q. If we go to your next slide you created, which is RDX-2C.10, how do the product photos we just saw in the provisional relate -- sorry.

Actually, I'm moving on to slide 11.

Can you explain what happened, then, from the provisional to the original claim that's filed with the '254 patent?

A. So I'm going to walk through a little bit of the file history. So this is basically the first thing that's happening now. So they are filing an application that claims priority to that provisional. And this is the original filed claim of that application.

Q. Why are we looking at the original claim of the '254 and not the '153?

A. Because the priority chain here is they filed a provisional initially, and then there was an application that turned into the '254 patent, and then there was a continuation patent or a continuation application that ended up as the '153 patent.

So all of this is part of the file history. It's going to be helpful as I walk through to kind of shed light on some of the claim terms that we'll be talking about.

Q. Did this claim, as it stands, ever issue?

A. No, it didn't. So I guess where we start the story is that they have tried to claim a really broad claim. So when you look at this claim, you basically have -- you have the drop line, you have the feeder cable, you have electrical connection between the drop and the feeder at the nexus, and then you have a way to secure that. And then you

have an overmold.

And so that, that is really, really broad. Of course electrical connectors is a pretty crowded field of art.

Can you stay on that slide for one more second?

Q. Okay.

A. One other thing I want to point out, again, there has been a lot of discussion about how this patent has to be specific to solar, and I just wanted to also note that, yes, it does say where the lead assembly combines power from a plurality of solar arrays, et cetera, some other things related to solar, but when we actually start looking at the prosecution of this patent, the Examiner explains that this "wherein" is really just an intended use and is not a structural limitation of the claim.

So when you're looking at that, you're really only considering the things that I've already said and not the rest of this "wherein" clause.

Q. While you were here this week, Dr. Cameron, Shoals' witnesses testified that the '153 patent is limited to solar systems, right?

A. Yes, I did hear that.

Q. So was there something in the file history that tells you it's not necessarily limited to solar systems?

A. Yeah. So partly what I just said, which is they

found this was an intended use down here, and then also you do see up in the top, the preamble also mentions the solar energy installation, and the Examiner also found that that was -- that had no patentable weight because that's, again, not a structural limitation in the preamble.

Q. And as you testified, this claim wasn't issued -- you created a slide for your testimony -- what does this slide show?

A. So, again, because that claim was so broad, the Examiner was citing a lot of art in its rejections.

So I have just put some of the images from the art that the Examiner cited in its rejections, and I elicited some of the other ones on the side here.

Q. You were here for Mr. Brooks' testimony?

A. Yes, I was.

Q. Do you recall whether he walked through the file history of either the '254 or '153 patent or its combination?

A. No, he didn't.

Q. If we go to the next slide, what happens next in the file history, Dr. Cameron?

A. So there is, again, many rejections from the Examiner, and they were obviously having difficulty getting a broad claim like they wanted, that they submitted initially.

And so eventually in 2020, so that's been, I guess, five years since they submitted the provisional, the Examiner actually sends the applicants an email, and says, okay, I'm not going to give you that very broad claim, but if you add the language here in yellow, I will allow it.

And so this is partly why it's important to look at the file history, because you look at some of the limitations that the Examiner is requiring, and one of them is what we've been talking a lot about this week, which is the aperture.

So the Examiner is the one that said you can't get your claims without the claimed aperture. So you have the first aperture extending continuously through, and you have a second aperture that's only partially through.

And then there's some other limitations that the Examiner added about the apertures, for example, being parallel and having different diameters.

Q. Thank you, Dr. Cameron.

If we go to the next slide that you drafted, which is RDX-2C.15, what happened to that Examiner's amendment?

A. So the applicant decided to accept the Examiner's proposed amendment so that it could get issued claims.

And so, again, remember, on the left here we have what was originally filed, very broad claim, and now, if you

could -- if you turn this on, you can see on the right I have boxed in red what the Examiner proposed and the applicant ultimately accepted and amended his claim to include so that he could get an issued claim.

Q. So ultimately what we get for the '254 patent is what's on the right?

A. That's correct.

Q. And that patent no longer is in this investigation.

A. That's correct.

Q. And you created, I think, one more slide, and what does this show, Dr. Cameron?

A. So this is now showing the next step. So now they have their -- well, a pretty narrow claim that was allowed by the Examiner over quite a bit of prior art. And now they file a continuation, because really what they want is a broader claim.

So now we have a continuation. They have still carried forward some of the things that were required by the Examiner, but as you can see they haven't carried over everything.

So now, for example, the aperture, the requirement the aperture needs to be parallel has been removed, and some other language in here.

So what has been carried through still is the

first aperture and the second aperture limitations.

Q. And carried forward with the notions of --

A. Completely through and partially through, of course, yes.

Q. Right. If we go to the next slide, Dr. Cameron, can you remind me, how does that claim language relate to the figures we've been discussing?

A. So this is, again, Fig. 7 on the right is the only cross-section that we have, and, again, this claim language is really reflecting what you see in the Fig. 7.

Q. So kind of what we see is the original claim 1 of the '153 when it's filed in April of 2021, right?

A. That's right.

Q. And that language, as that claim as filed, would map up or kind of correlate with Fig. 7 of the patent and, frankly, that joint detail from the provisional application?

A. That's right, because, of course, you have the feeder cable that's in an aperture that extends partially through, and you have that second aperture that only extends partially through.

Q. Now, was this original claim allowed?

A. No, it wasn't, because, of course, the Examiner proposed adding a bit more than is in the red box now, and so now that they have removed some of those things from the box, now there's other prior art that an Examiner is

rejecting this claim over.

Q. And, for example, go back, Mr. Brooks, to slide 12.

Can you tell us what happened to that original claim? Did something happen with respect to some of this art?

A. Yeah. So I just wanted to talk about one particular rejection they got. I don't know if you can control it, if you can zoom in on this Fig. 9A of Yamawaki, that would be great.

So, yeah, so, again, there's more rejections because the claim at this point is broader than the one they were able to get in the '254. And I think one thing that's interesting here is that the Examiner looked at this Yamawaki reference and pointed to this cable here, 32, as the feeder cable, and this 31, this cable here, as the drop line. So 31 is here, drop line, 32, feeder cable.

And the Examiner found that all of those other limitations, like there is a drop line, there is a feeder cable, there is electrical connection at the nexus, there's undermold, there's overmold, there's undermold surrounding the nexus, but what wasn't there was the apertures.

And so they had to take another reference in combination with Yamawaki to show the partially through aperture and the completely through aperture.

So if you could scroll down to the lower left, this is what the Examiner thought that they needed to add to Yamawaki to show that you have the partially through, now the drop line is on the bottom here, partially through aperture for the drop, and completely through aperture for the feeder cable.

And so that kind of gives you some insight into the Examiner's understanding of aperture, for example.

Q. And so the Examiner rejected claim 1 as we just discussed?

A. That's correct. So the Examiner actually rejected claim 1 over Yamawaki where, again, feeder cable is here and the drop line is on top here, in light of Vander Ploog, of course.

Q. If we jump to slide 18, so they weren't able to get claim 1 in the '153 in view of Yamawaki and Vander Ploog?

A. Yeah, there are other -- there was obviously other rejections as well, but, yes, so they were not able to get that. But they did have also an originally filed claim 10 in that '153 application, and so that had all the requirements of 1, and then that had further comprising a third aperture extending partially through the undermold, because, as you kind of saw in my previous slides, neither Yamawaki nor Vander Ploog had this additional limitation.

And so the Examiner said, well, you can't get your claim 1, but you can get your claim 10.

And so what the applicant did is say, okay, I'm going to take this limitation for the third aperture extending partially through and add it to my claim 1 and then get that issued.

And so I have drawn here, this is my drawing on the bottom right here, to show what that would look like by adding a third aperture extending partially through the undermold to the Fig. 7 that we had been looking at before.

Q. You were here in court when Mr. Macias testified that Shoals makes products corresponding to a similar image to what we have on slide 18.

A. Yes. I was here for the testimony of Mr. Macias, who testified that this kind of configuration was actually one that Shoals had.

Q. If we go on to slide 19, what about Figs. 29, 33, and 35 of the patent, any of them depict three apertures?

A. No, they don't. And I kind of put this here because I was here during the opening where these figures were discussed.

And I just want to point out that there is no disclosure in the patent that any of these have two apertures that are only partially through. So I've put on the right the actual description of these figures. And so

what it actually says is as shown in Fig. 35, the drop line and feeder cable are held together by compression lug 20, which is surrounded by undermold 22, which is surrounded by overmold 24. And overmold 24 preferably defines at least one aperture 25 for receiving zip-ties and the like.

So it talks about an aperture here unrelated, but there's no discussion of, oh, there's three apertures in this setup here.

Q. Do you recall if Mr. Brooks provided any testimony regarding figures of the patent?

A. No, he didn't.

Q. If we turn to the next slide, slide 20, what are we showing here, Dr. Cameron?

A. So this is Fig. 37. This was shown in the opening kind of as a montage sequence with the previous ones that I showed on the previous slide, and I just also wanted to point out that this figure is not linked to the previous ones in the patent. So the other three are linked together, but this one is not.

And I, again, have just put the disclosure of the patent on the right, and so this is, again, not telling you that this is eventually going to have two partially through apertures or anything like this.

The actual disclosure is just referring to Fig. 37, drop 12 and feeder cable 14 electrically couple at

nexus 19 of joint 17. This is preferably accomplished by stripping wire insulation 16 from corresponding segments of drop line 12 and feeder cable 14.

So, again, not only is there no discussion about there being somehow two partially through apertures here, there is really not even a discussion -- I mean, here it's really just even pointing to drop line 12 only.

Q. You moved us along, and I guess we can move forward.

So for each of the independent claims of the '153 patent, were the aperture limitations with the partially through and completely through from the original claim 1 and a third aperture limitation that we saw in dependent claim 10 included in the issued claims?

A. Yeah. So I just wanted to point out, again, that that 113-word amendment that eventually turned into the stuff in the box, that's present in all of the independent claims, and so all of the claims, asserted claims, of the '153 patent.

Q. And the asserted claims relate to a mold -- an undermold with certain features.

A. Yes, again, the aperture -- I know there's been kind of a lot of discussion this week about drop lines, but I do think it's important to focus first on what's really being claimed here, because the drop line is claimed

separately from the feeder cable, and the undermold. And the apertures are discussed with respect to the undermold.

And so what's claimed is an undermold that fully encases the nexus, and the undermold needs to have three apertures with specific characteristics, including one of them being completely through, one being partially through, and the third being partially through.

Q. And the undermolds in claim 1, claims 21 and 24, have primary mold but same features, right?

A. That's correct.

Q. If we want to transition to claim construction, Dr. Cameron, after stepping through the file history, you created a slide for your testimony. You know the ALJ issued a Markman Order in this case.

Did you analyze it?

A. I did review the Markman Order, yes.

Q. And do you understand that the claims of the patent must be read from a perspective of a person of skill in the art?

A. That's correct.

Q. Do you know what a person of skill in the art is?

A. Yes, I do. So I actually have reviewed all of the parties' kind of proffered definitions of a person of ordinary skill in the art, so I made a slide of that too.

Q. And so you know the parties have different

proposals of the ordinary skill. As you said, you made a slide, RDX-2C.24.

A. Yes, I did. I just wanted to touch on this very quickly, which is that these are relatively similar, and I don't think your interpretation of the claims is really going to change based on differences between these.

But at the same time I did want to kind of comment on the differences, because the Complainant's contention is that a person of ordinary skill in the art needs to have two years of experience working with photovoltaic systems, who has an understanding of EBOS for industrial solar power installations; whereas these other ones, the Markman talked about two years experience with PV and electrical wiring; whereas Respondents', it's a little bit more broad and just says electrical wiring and connectors; and Staff has electrical wiring, associated fuses, connectors and moldings.

I just wanted to stress that this patent is really -- it's an electrical connector, and you do not need to know about PV systems to understand the '153 patent.

And so I don't have -- I mean, for me, it's not going to affect the claims really, and it's -- I'm a person of ordinary skill in the art under any of these definitions, but I guess I just did want to put forward that, from my perspective, you don't need to have this very -- you

certainly don't need to have this very specific industrial solar power experience to understand how an electrical connector works, to understand how the molding of that connector works, et cetera.

So it's not that these are so different, but I did want to touch on that, on that minor difference.

Q. So as you just mentioned, the specific understanding of EBOS systems is not necessary to understand this patent or its claims?

A. That's correct.

Q. If we turn to slide 25, back to the Markman Order, are you aware that the order issued after you provided your report in this case?

A. That's correct. So I've just summarized the ALJ's construction for the terms on the left.

Q. Were the ALJ's constructions for the extending partially terms tentative?

A. Yes. When I reviewed the order, I -- the language in the order discussed that those were tentative -- her tentative construction.

Q. And I think there was something in there with respect to the primary mold in the sense of remaining factual issues as to whether partial molding material and, I guess, legal issues on the word "encase," whether the primary mold fully encases.

A. Yes, that's correct. So what I assume that meant was she was going to review evidence, I guess, from the hearing itself.

Q. And, again, as we've established, you were in the courtroom for Mr. Brooks' testimony?

A. I was, yes.

Q. Did you hear Mr. Brooks testify that the aperture stops at the nexus?

A. Yes, I did hear that testimony.

Q. Do you agree with his explanation of the construction of aperture?

A. No, I don't. And -- no, I don't.

Q. Why not?

A. First of all, it's not consistent with the intrinsic record, and maybe, more importantly, if you were to accept that understanding, there would be no reason to have that language in the claim, because that would become meaningless and already satisfied as long as you satisfied other elements in the claim already.

Q. Based on that, Mr. Brooks effectively doesn't provide any meaning to words like "partially through" or "completely through," and we'll walk through that a little bit later, correct?

A. That's correct, yes.

Q. It's almost like he is applying original claim 1

of the '153 that wasn't allowed in some sense. In fact, maybe even of the '254.

A. That's right.

Q. Now you said it would make limitations meaningless.

What do we mean by that?

A. I'm going to move forward on the slide, if you don't mind.

I just wanted to kind of walk through what we already have in the claim. So we already know that we have the drop line and the feeder cable that are electrically coupled at the nexus, and we know that we have an undermold that fully encases the nexus.

So if the understanding of how you tell if you have an aperture partially through is you're starting at the nexus and you go outside, that means you would necessarily have an aperture that's partially through, because you already know the undermold fully encases the nexus and you already know that the drop line is coupled to the feeder cable at the nexus.

And so this just basically means you don't have to worry about whether there is an aperture extending completely through or partially through, rather. You just already know it's there.

Q. So if we took Mr. Brooks' understanding, we would

always have a second aperture extending partially through, right?

A. Yes. So, actually, Mr. Brooks was asked about that during his cross-examination, and he actually did agree that that would necessarily be present. So I just put his deposition testimony up here.

He is confirming that, that's right, every time you have that, have the drop line, you're going to necessarily have an aperture associated with it, and that aperture is necessarily only extending partially through the mold.

Q. And that's on RDX-2C.27.

And you also said Mr. Brooks' understanding of the aperture limitation was not consistent with the file history.

What do you mean by that?

A. So from my review of the file history and what the applicant needed to amend and to do in order to get an issued claim, which included having to add that language about an aperture that only extends partially through, it does not make sense to me that that language has no meaning and is just automatically there.

Q. And that language is in the claims?

A. Yes, in all of the claims, yes.

Q. Words have meaning.

A. Yes.
Q. We've heard that a lot this week.
A. Yes.
Q. If we go to slide 30, let's turn back again to the Court's construction of aperture.

Are there any other implications if we accept Mr. Brooks' understanding of the aperture terms?

A. Yes. I think there's something that's even more troubling, because the problem is that that's fine, you can get rid of the limitation that, you know, has the aperture that's only partially through, as you want it to be, but then you do still have to apply that same understanding when you look at the aperture that the feeder cable is inside. And when you use that same logic to look at the feeder cable, and you wind up with a situation where you also only have a partial aperture where the feeder cable is.

And Mr. Brooks was also asked about that during his cross-examination, and his response was simply that, well, everyone agrees that the feeder cable goes through. And there was actually no discussion about, well, okay, but if we all take your view of the universe, then it doesn't go through.

And so I think that's another thing that's very problematic, about the way that he is interpreting aperture.

MR. CHAIKOVSKY: Your Honor, before we continue,

can we go on the Voltage confidential record?

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

MR. CHAIKOVSKY: Thank you.

BY MR. CHAIKOVSKY:

Q. If we turn to RDX-2C 36, can you address the Court's discussion of the situation where one cable comprises two drop lines?

A. Yes. So I just put a figure here so to kind of orient ourselves. This is really what the dispute related to this is, and it's, you know, the question is whether that's -- that you have to look at the entire pathway or part of the pathway.

And my understanding from reading the Markman, because it was discussing this concept of entire prior art, so I just highlighted some language from the order that I read.

So the issue is whether you need to look at the entire pathway or just part of the pathway, and there was the opinion that there's no basis for construing aperture to just be part of the pathway. So in my mind that means that you need to look at the whole, the entire whole, or entire aperture, not just -- not just part of it.

Q. And as we noted earlier, the Markman Order with respect to this was tentative.

A. That's correct.

Q. And when you look at the one cable that comprises

at least two claimed drop lines, what import did that have on your analysis of the claims and the meaning of the term aperture?

A. So I had this kind of concept in mind when I did my analysis, so I was looking at the whole pathway.

Q. Okay. And Dr. Cameron, what is your opinion regarding the term aperture in both the '254 and '153 patents?

A. So, I guess, from my view I guess there's -- it's a little -- I think some of the confusion comes from tying aperture to drop line, and that's why there's still some different interpretations of what's been said in the Markman Order.

For me, you know, an aperture is really -- it's just a 3D hole. So as in the entire pathway for a cable in the undermold or the overmold -- sorry -- in the undermold or primary mold -- that exists when it's viewed when the entire cable has been removed.

Q. And if we turn to RDX-37, how does that work on Fig. 7 we've looked at earlier?

A. So if you look at the figure on the left, that's kind of what's in the Fig. 7, and then the blue and the green annotations are mine on the right, which is what it would look like when you remove the cables. So, again, you have -- you would have a fully through, completely through

aperture, and this one would be partially through.

Q. And how about as you look at your demonstrative RDX-2C.38?

A. So this was the same thing. So I took the figure that I made, adding an additional drop line to Fig. 7, and then I, on the right, showed how that works for that additional one. And so that one would also be partially through.

Q. If we turn to RDX-2C 39, to sum it up, is the aperture language in all three dependent claims?

A. Yes, it is.

Q. Okay. If we go -- I guess I'm being told to speed up.

If we go to slide 40, can you remind me what was the construction for primary mold?

A. So from the Markman Order I just put it on the left here. So it's a mold fully encasing the nexus and substantially sealing the nexus from external environmental conditions, and then to the extent there's more than one mold with these characteristics, a primary mold is the innermost of such molds.

Q. Now you created a slide.

Did Mr. Brooks have an opinion on fully encase with respect to the undermold in claim 1 and primary mold in claims 21 and 24?

A. Yes, he did. So from reviewing Mr. Brooks' report and his deposition testimony, my understanding is that Mr. Brooks believes that, if you basically look at the nexus and you can see it, then that means that it's not fully encased.

Q. What import does that have on your opinions on the meaning of encase?

A. So I looked at the different products in the case, and under Mr. Brooks' understanding of fully encase, it doesn't meet that limitation for the alternative design.

Q. And do you have an understanding of what the word "encase" would mean?

A. Yes. So I did look at Mr. Brooks' understanding and applied that to look at the products. For me, you know, fully encased is really closely wrapped. So it's a bit more than Mr. Brooks is saying. But either way, I did look at the products under Mr. Brooks' understanding.

Q. Was there any other language in the -- in that construction for primary mold?

A. Yes. So there was the "fully encase" language, but then there was also "substantially sealing the nexus" language as well.

Q. So if we go on to the next topic, technical domestic industry, Dr. Cameron, did you provide any opinions relating to this?

A. Yes, I did.

Q. Dr. Cameron, what were those opinions?

A. So for Shoals' products, they don't have the limitations that I have highlighted here. So including the second aperture extending partially through the undermold and a third aperture extending partially through the undermold.

MR. CHAIKOVSKY: Your Honor, if we now go on the Shoals confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MR. CHAIKOVSKY:

Q. If we turn to RDX-49, we're going to focus on infringement now or noninfringement.

What Voltage products did you analyze, Dr. Cameron?

A. I have listed them here. So I looked at 15 different configurations of the Voltage products, and I did CT scans of each one of them.

Q. Okay. And so how about in addition to those products that were on slide 49 that you analyzed, what about these on slide 50?

A. So I also analyzed the three alternative design configuration that I was given and did CT scans of those as well.

Q. And the exhibit numbers for all these original designs or alternative designs are on slides 49-50?

A. That's correct.

Q. And those products -- sorry.

If we go to, then, slide 52, can you please explain why you believe Voltage products, whether it's the original design or alternative design, do not infringe?

A. So once again, Voltage's products and the

alternative design don't have a second aperture extending partially through the undermold or a third aperture extending partially through the undermold. And the alternate design also doesn't have an undermold that fully encases the nexus or a primary mold that fully encases the nexus so as to substantially seal the nexus from environmental conditions.

Q. We're going to focus on the independent claims here obviously today, but you understand that if the independent claims are not infringed, what happens to the dependent claims?

A. So all of the dependent claims also include the requirements of the claim they depend from, so all of the claims include the limitations.

MR. CHAIKOVSKY: Your Honor, if we can go back on the Voltage confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

CROSS-EXAMINATION

MR. HARRIS: May I approach the witness, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may.

BY MR. HARRIS:

Q. Good morning, Dr. Cameron.

A. Good morning.

Q. You know what the NEC is, right?

A. Yes.

Q. And what is it?

A. The National Electric Code.

Q. And you know what Article 690 of the NEC is, correct?

A. I don't have the code -- the numbers within that memorized, no.

Q. So you don't no that Article 690 of the National Electric Code is entitled "Solar Photovoltaic Systems," do you?

A. That could be.

Q. And you've never read Article 690 of the National Electric Code, have you?

A. I probably have at some point, yes.

Q. Do you know what NABCEP means in the solar industry?

A. I'm not sure.
Q. So you are not certified under the North American Board of Certified Energy Practitioners, are you?
A. I am not.
Q. Are you familiar with PVsyst?
A. Not offhand, no.
Q. Do you have a license for PVsyst?
A. No, I do not.
Q. So you didn't know that PVsyst is design software for designing a solar power plant, did you?
A. I may have known that, but I didn't recall that acronym offhand, no.
Q. Do you know what ITC means in connection with the solar industry?
A. No.
Q. So you don't know about solar investment tax credits, do you?
A. I do know some things about the investment tax credits.
Q. Now you are a licensed professional engineer, am I right?
A. I am, yes.
Q. And you know what IFC plans are, right?
A. Yes.
Q. And what is your understanding of what IFC plans

are?

A. Sorry. I thought you said something else. What did you say?

Q. Did you know what IFC plans are?

A. No, I don't.

Q. So you have never stamped "issued for construction" plans as a licensed engineer in the solar industry, have you?

A. I'm a mechanical, not a civil, engineer.

Q. And you have never designed a utility-solar-scale power plant, have you?

A. That's correct.

Q. You have never operated a utility-scale solar plant, have you?

A. That's correct.

Q. You've never worked with an EPC or an engineering procurement and construction company in relation to a utility-scale solar project, have you?

A. I may have.

Q. You may have or you haven't?

A. I'm not -- I'm not a hundred percent sure if the different parties call themselves engineering procurement or not, but I have provided consulting services kind of related to disputes between like owners and people that install those.

Q. Mr. Beall, could we please -- well, first, let me ask this.

Do you remember being deposed in this case?

A. Yes, I do.

Q. And that deposition happened on January 11th, 2024?

A. That's correct.

Q. Thank you.

Mr. Brooks, could you please pull up the deposition transcript of Dr. Cameron and play her answer at page 41, lines 1 through 4.

(The following video clip was played:)

"I take it you've never worked with engineering procurement and construction company in relation to a utility-scale solar project?

"I have not."

Now you have no publications on solar energy generation, am I correct?

A. That's correct.

Q. And you are not involved in the solar industry on a day-to-day basis as part of your employment; is that right?

A. That's correct.

Q. And you consider Mr. Brooks to be one of ordinary skill in the art, right?

A. Based on his representations and his background, yes.

Q. And you would also consider Mr. Brooks to be an expert in the solar industry, right?

A. Again, based on his representations of his background, yes, I would.

Q. Now, as part of your work for this case, you did not visit any Voltage facilities, am I correct?

A. That's correct.

Q. And you did not have any discussions with anyone at Voltage as part of your work in preparing the opinions in your expert report for this case, right?

A. Sorry. The first -- I missed the first part of your sentence.

Q. You did not have any discussions with anyone at Voltage as part of your work in preparing the opinions in your expert report for this case, did you?

A. That's correct.

Q. Now I believe you mentioned you're a patent agent; is that right?

A. I am, yes.

Q. And you have not drafted any patents related to the solar industry, correct?

A. That's correct.

Q. You are not offering any opinions as a legal

expert in this case, correct?

A. That's correct.

Q. So you are not offering any opinions as an expert on the law, am I correct?

A. That's correct.

Q. From 2019 to your -- to current, about 50 percent of your time is spent as a technical expert in legal matters, right?

A. That's correct.

Q. Now you performed CT scans as part of your work in this case, right?

A. I did.

Q. And you agree that those scans were done in your company ESI's lab, am I right?

A. That's correct.

Q. And you'll agree that you started to scan the products for this case after the 2023 Christmas holiday, correct?

A. I don't remember exactly, but that sounds correct.

Q. Do you have any doubt in your mind?

A. I'm not a hundred percent certain that's true, but it also does sound correct.

Q. Mr. Beall, could you please play Dr. Cameron's deposition at page 78, lines 16-22.

(The following video clip was played:)

"And when were the scans done?

"Over the course of the last, I don't know, three -- two, three weeks. Two or three weeks, something like that.

"So were they done starting after the Christmas holiday?

"I think that's right. Yes."

And those scans were completed at the beginning of January 2024; is that right?

A. That also sounds right, yes.

Q. Now you did not scan the alternative design products that were produced to Shoals and that Mr. Brooks analyzed, did you?

A. Did I CT scan the ones that were sent to Mr. Brooks?

Q. Correct.

A. No.

Q. Okay. Dr. Cameron, you would agree with me that solar panels produce DC power?

A. I agree.

Q. Solar panels do not produce AC power, correct?

A. That's correct.

Q. AC power is not -- excuse me. Let me restate that.

The DC power produced by solar panels is not converted to AC power until it hits the inverter; is that right?

A. That's correct.

Q. Now on your direct testimony I believe you testified about slide 12.

Do you remember that?

A. I do.

Q. And you would agree with me that the Patent Examiner allowed all of the claims of the '254 patent over the prior art that you've listed on slide 12, right?

A. The final claims, yes, that's correct.

Q. This is slide 39 from your slide deck; is that right?

A. That's correct.

Q. And in the middle it lists claim 21?

A. That's correct.

Q. 21 is directed to a solar power system, correct?

A. That's correct.

Q. And the first limitation requires a plurality of solar panels; isn't that right?

A. That's correct. Actually, I should --

Q. I just wanted a yes/no.

A. Well, that may not be the correct answer, then.

Q. So I'll put it back up.

Does the first limitation require a plurality of solar panels?

A. So, actually, if you look at the prosecution history, those limitations that were related to the solar panels were basically said to be an intended use, as I mentioned before.

Q. And that's true for claim 21 and limitation 1? Limitation 1 has no -- has no limitation on claim 21, is that your testimony?

A. I would -- to be certain of that, I would need to review the file history again, but I do remember looking through the prosecution history and the Examiner saying that the -- that most of the things that were related to solar were intended use.

Q. So, yes or no, does claim -- in claim 21, does the first limitation add any limitation to the claim or not?

A. I would need to review the file history to say that with certainty.

Q. So you don't know?

A. I would need to review the file history, that's correct.

MR. HARRIS: Your Honor, we're now going to move to the Voltage confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving to the public record.

EXAMINATION BY COUNSEL FOR ITC STAFF

BY MR. SHIN:

Q. Good morning, Dr. Cameron.

A. Good morning.

Q. I'd like to follow up. Earlier during your testimony you were talking about certain things in the intrinsic record, right?

A. That's correct.

Q. I'd like to return to the intrinsic record. I'd like to show you what has been marked as JX-85.

And as you can see from the screen that it is the file wrapper for the '254 patent.

A. That's correct.

Q. And you also see the filing date in September 2015 and the issue date in April of 2021?

A. '23, yes. Oh, the issue date in '21, yes, I see that.

Q. Now earlier you had a slide on the original claim 1 of the '254 patent. I'd like to revisit that, if I can.

So here on page 16, we see some of the claims. Starting with the independent claim, you see I've highlighted lead assembly.

Through the course of the investigation and the hearing, it seems that lead assembly can be interpreted different ways, is that fair to say?

A. Yes. I did hear some of that testimony.

Q. Like a lead assembly can be -- it can mean a larger sort of harness, which includes multiple drops, right?

A. I heard that, yes.

Q. Or it could refer to just a mold drop, is that fair to say?

A. I agree with that, yes.

Q. So there's sort of -- in different contexts the term can be used in different ways.

A. I would agree with that.

Q. And there's nothing wrong with that, is it?

A. No, there isn't.

Q. But sometimes, as it applies to patenting and claims, it just may not be as precise.

A. That's correct.

Q. And there might be other instances of this as well, but let's go through the claims.

So the original claim was focused on one, at least one drop line.

Do you see that?

A. Yes.

Q. And it says "at least," but the drop line, there is an embodiment in the specification, and that embodiment is represented by at least Fig. 7 that we've seen throughout the hearing, is that fair to say?

A. That's correct, yes.

Q. So that's at least one drop line. It's one specific drop line, but it's also supportive of the original claim where you have at least one drop line.

A. That's correct.

Q. And then in the next element B, it says at least one feeder cable, and then it goes on and says at least one feeder cable electrically coupled at a nexus.

Do you see that?

A. I do see that, yes.

Q. Does at least one feeder cable make sense?

A. Yes.

Q. Like, when you talk about a larger lead assembly or a harness, do you have multiple feeder cables? Well, does a -- I'm thinking of, we've seen pictures of harnesses where you have a positive harness and a negative harness.

A. Yeah.

Q. Does a lead assembly, would it cover both a positive harness and negative harness together to where you have the two separate feeder cables?

A. Sometimes it kind of depends, but in some

applications you might have like two feeder cables within. It's not that typical. In this application usually we just have one feeder cable, but it's actually not impossible to have a system where there's two, yeah.

Q. All right. Let's move on.

We go to element D and it says an overmold and it goes on.

Do you see that?

A. Yes.

Q. Now in the original claim an overmold was just one molding, right?

A. That's correct.

Q. And then it was subsequently changed to undermold when the second mold was added?

A. That's correct.

Q. And then we go down and we see in dependent claim 2 that at least one drop line includes a section of exposed wire at said nexus.

Do you see that?

A. I do see that, yes.

Q. Now you may recall, I think I used this on Mr. Brooks, I used the actual issued claims, but this is the original claim. But the exposed wire was still there.

So does that inform your understanding of what the drop line is in independent claim 1?

A. Yes, because I guess you know that it has -- at least have the possibility of including a section of exposed wire at the nexus.

Q. So you have to at least include the portion of exposed wire at the nexus for the drop line?

A. I agree with that, yes.

Q. And the same thing for dependent claim 3, said at least one feeder cable includes a section of exposed wire at said nexus, the feeder cable also has to have exposed wire, right?

A. That's correct, yes.

Q. And so these aren't additional structural things that you add on to the drop line or feeder cable that are identified in claim 1. They are necessarily part of those structural elements, aren't they?

A. Yes. So if there's an exposed wire, it would be part of the drop line, yes.

Q. So if we go back up to element B in claim 1 where I've highlighted "said at least one feeder cable electrically coupled at a nexus" -- I'm sorry, let's start earlier, "said at least one drop line and said at least one feeder cable electrically coupled at a nexus," you could also read that to mean said at least the exposed wire of one drop line and said at least -- and said exposed wire of at least one feeder cable electrically coupled at a nexus.

Does that make sense?

A. So you're saying that you'd always need an exposed wire in claim 1? I'm not...

Q. Yes. I mean, to have the electrical coupling, I mean, when we're talking about the feeder cable, the feeder cable is a component, right?

A. That's correct.

Q. And in its raw state the feeder cable is an insulated cable that's brought to the factory in a spool.

A. That's correct, yes.

Q. Okay. And then the same with the drop line. The drop line is the drop cable that's also -- it's probably a smaller diameter, but it's also brought to the factory as raw material in a spool.

A. That's correct, yes.

Q. And then when it goes in to manufacture, certain portions of the insulation for both the feeder cable and the drop line have to be exposed, right? I mean, they have to be taken off and the wires have to be exposed.

A. In Shoals' and Voltage's products, yes.

Q. Okay. But in the claim, isn't it sort of implied that the electrical connection has to occur where there is exposed wire? I mean, you can't have an electrical connection through the insulation is what I'm talking about.

A. No, you can't have -- you would have to have,

obviously, some electrical pathway between the drop line and the feeder cable. Obviously the most common way is what we see in Voltage and Shoals products, where you expose the wire and have, for example, a compression lug that makes the electrical connection.

Q. Okay. And if we go down to dependent claim 5, the original dependent claim 5 read, "the lead assembly of claim 4 wherein said overmold defines at least one aperture."

Do you see that?

A. Yes, I see that.

Q. And you understand in the context of the original claims the aperture is not -- it is not referring to the aperture that we've been discussing here. It refers to more of a -- just a plastic hook where a zip-tie can be attached at the outermost part of the molding.

A. That's correct. I kind of highlighted that in my figures during my direct.

Q. Whereas, here we're talking about apertures that are specifically within the undermold?

A. That's correct.

Q. If we turn to the next page, we see another set of claims directed to a solar power system, independent claim 6.

A. I see that, yes.

Q. Do you recall reviewing all the claims, all the original claims of the '254 patent?

A. I did, yes.

Q. And, again, there are some things I've highlighted, a wire harness in element A, a lead assembly in element B.

A. Yes, I see that.

Q. And then also in B you see where it says, "said first drop line and said feeder cable electrically connected at a nexus"?

A. Yes, I see that.

Q. And that's the same in the independent claim 1?

A. That's correct.

Q. And then we see dependent claim 7, and in element B you see, "a second drop line electrically connected to said second wire harness, said second drop line electrically connected to said feeder cable at a second nexus."

Do you see that?

A. Yes, I do.

Q. Do you have an understanding of what that second drop line is referring to?

A. So that would be, basically, you could, for example, you could have, like, two compression lugs and do the connection that way. So then you'd have -- sorry. Let me -- can you ask your question again actually? When I read

claim 7 --

Q. Excuse me?

A. Can you ask that again and also point me to which claim we're looking at again?

Q. Oh, okay. Looking at dependent claim 7, the second drop line. So we talked about the lead assembly could be the larger harness or it could be a smaller mold drop, right?

A. Right.

Q. And so in the larger assembly, a second drop line could be a second mold having one drop line, right, but two separate drop lines on two separate molds?

A. Correct.

Q. In the overall assembly?

A. That's correct.

Q. But is it possible to also see this as a second drop line within the same mold drop?

A. Oh, yes, of course. Yes.

Q. But if that were the case, then the remaining language, "electrically connected to said second wire harness, said second drop line electrically connected to said feeder cable at a second nexus," how does that implicate the second drop line if it has to be connected at a second nexus in the same mold drop?

A. So that is what I was saying originally. So you

could have, for example, two separate lugs, so you would have a second nexus between the second drop and the feeder cable.

Q. Is it possible to also look at nexus in terms of the electrical connection between the feeder cable and a first drop line wire?

A. Yes.

Q. And then have a second nexus within the same compression lug for a second drop line wire?

A. I would agree with that too, yes.

Q. For example, if one drop line wire came in from the top of the compression lug and a second drop line came in from the bottom, even though we -- if it's one compression lug, could there be separate nexuses that provide the electrical connection for the first drop line to the feeder cable and then the second drop line to the feeder cable?

A. I think -- I haven't thought about that issue before, but just thinking about it for a few seconds right now, I think I would agree with that, yes.

Q. And you have a -- you provided a demonstrative -- well, you've seen the demonstrative where you have Fig. 7, you have one drop line coming in, but then you add another second drop line coming in, right?

A. Yes, I recall that.

Q. And would that demonstrative where you have two separate drop lines coming in on the same side, would that sort of reflect this type of a construction where you have a second drop line electrically connected to said feeder cable at a second nexus?

A. Yeah, I think that's fair. That's similar to my previous response. I think that's fair.

Q. All right. Let's go to your slides. Let's go to RDX-2C at page 14, please.

Now we looked at -- we just looked at the original claims of the '254 patent, and we understand that -- and we understand over the course of the five-plus years of patent prosecution that there were multiple amendments that were made, right?

A. That's correct.

Q. And here we see what the email that the Examiner sent to the patent prosecuting attorney, and you've already gone over this, and you've highlighted the proposed amendment by the Examiner, but at this point in time, for example, in element D, the overmold was subsequently changed to undermold.

A. That's correct.

Q. And then the applicant also added the next portion, having an inner surface and an outer surface; is that correct?

A. That's correct.

Q. So they were really looking at the undermold in terms of a structure, and you can't really tell that structure in its final product, isn't it more like the structure of -- if you could just look at the undermold, if you could strip everything away, then you could more clearly understand where the inner surface of the undermold is?

A. I agree with that, yes.

Q. And I think we may have seen something like that in Ms. Ge's testimony yesterday, either a demonstrative or a physical exhibit of the white undermold just by itself.

A. That's correct, yes.

Q. And so you can sort of see through it in certain areas or not see through it, but there's no wiring at all in it.

A. Yes, I recall that.

Q. And does this language sort of reflect that type of a structure?

A. Yes, I would agree with that.

Q. If we focus on just the inner surface and the outer surface of the undermold, we're sort of looking at that structure, so after the product has been made but after you strip everything else away.

A. I agree with that, yes.

Q. And that could also be viewed sort of in the

manufacturing stage. I mean, the overmold is placed over -- I'm sorry -- the undermold is injection molded, but at that point in the manufacturing process you can't really strip away all the cables and wires, can you?

A. That's correct.

Q. But doesn't it also reflect sort of a manufacturing -- a point in time during the manufacturing process?

A. I agree with that, yes.

Q. Let's go to your slide 19. I'd like to focus on Fig. 35 at the bottom.

Fig. 35 in the specification of both the '254 patent and the '153 patent, it shows some pictures, and it could be related to these figures and other figures, but it shows sort of sequential steps that occur sort of in a manufacturing process; is that fair to say?

A. In a general sense, yes, that's fair.

Q. Like here in Fig. 35 it shows an interim step where you have the feeder cable and then you have the drop line, and then you have the compression lug attached to both the feeder cable and the drop line?

A. That's correct.

Q. And so this is before the final product?

A. That's correct.

Q. All right. And here Fig. 35 identifies the drop

line as 12.

Do you see that?

A. I see that, yes.

Q. And so let's read starting on the third line, if we could highlight it, "as shown in Fig. 35, the drop line and feeder cable are held together by compression lug 20."

And so does that reflect that the drop line is the entire drop line and the entire wire extending all the way from the left, all the way to the right?

A. Yes. This is kind of what I was talking about in my direct where, you know, I did look at all the instances, and it wasn't exactly clear about drop line, but certainly from this particular passage that seems to be the case, yes.

Q. And the patent speaks to the sort of sequential steps during what could be viewed as a manufacturing process, right?

A. That's correct.

Q. And so there was certainly several locations, like Fig. 35, where it says the drop line and feeder cable are held together by compression lug 20.

A. I agree.

Q. And here it's clearly the entirety of the wire of 12.

A. That's what it looks like to me.

Q. There's no need to delineate anywhere in the

middle or where it meets the nexus.

A. I would agree with that, yes.

Q. And, again, in another location, on your next slide, 20, here it's a similar picture, but it's actually -- Fig. 37 is before the compression lug was put on.

A. That's correct.

Q. And if we just read the passage from the specification, I can't highlight it, but we'll read all of it.

"Referring to Fig. 37, drop line 12 and" -- let's just stop there.

And we see the same thing, the applicant identified the entire wire as drop line 12.

Is that fair to say?

A. It does seem that way, yes.

Q. And feeder cable 14 electrically couple at nexus 19 of joint 17.

Do you understand that, right?

A. Yes, I do.

Q. I guess joint 17 is not on here, but we understand that the joint would sort of be afterwards. It would be the entire mold drop.

A. Yeah, I would agree with that.

Q. And it says, "this is preferably accomplished by stripping wire insulation 16," and it's not shown here,

"from corresponding segments of drop line 12 and feeder cable 14."

So does that refer to what I was talking about earlier, the raw materials, the cables and wires are all insulated?

A. I would agree with that, yes.

Q. And then you have to strip the wire insulation 16 from corresponding segments of drop line 12 and feeder cable 14, right?

A. That's correct, yes.

Q. And from Fig. 37 it is very clear, then, that we're talking about the entirety of the drop line?

A. That's what it appears to be, yes.

Q. And the entirety of the feeder cable?

A. I would agree.

Q. So in the context of what we've been discussing, the applicant refers to drop line 12, but could that also be referring technically to the wire 12?

A. I would agree with that, yes.

Q. And could that also be fairly called a drop wire 12?

A. I would agree with that as well, yes.

Q. Or a drop cable 12?

A. Agreed.

Q. And so when we go to slide 25, we have a summary

of the ALJ's claim constructions, right?

A. That's correct.

Q. And if we go to this, the second term, I want to -- well, no, let's go to aperture up top. The top row is aperture. The ALJ's construction is entire pathway of the feeder cable or drop line within the undermold or primary mold, when viewed as if the feeder cable or drop line were removed.

And you agree with her construction, right?

A. I agree with that, yes.

Q. However, there is a little bit of tension or ambiguity, perhaps, we're trying to clear up.

Do you understand that earlier Staff and Respondents proposed a construction or modified a construction that was exactly this except, instead of drop line, we proposed drop line wire? Do you recall that?

A. I do recall that, yes.

Q. And your opinions were based on that construction, right?

A. That's correct.

Q. And with the ALJ's construction, you're still applying your same opinions?

A. That's correct.

Q. You believe that those two proposals or those two constructions are equivalent?

A. I did, yes.
Q. Basically.
A. I do, yes.
Q. And that's in line with what we're talking about here. Drop line is like drop wire?
A. I would agree with that, yes.
Q. And when you just focus on what's in parentheses, feeder cable or drop line, when you sort of look at that, juxtapose those two terms, doesn't that more clearly reflect the comparison or identification of two cables?
A. Yes.
Q. Two wires.
A. Of course, yes.
Q. So we're not talking about like a function of the feeder cable as electricity passes through it or a drop line as electricity passes through it. We're really just talking about, as we looked at in the specification, we're talking about raw materials, aren't we?
A. I agree, and that's partly what I was trying to explain earlier, yes.
Q. But there is some tension because the claims actually point to a finished product, right?
A. That's exactly where the confusion comes in, and that's why I said I think a lot of the tension that we've seen all week is because of that, yeah.

Q. And let's go to the second row, and this is the claim element in question, right, and the top bullet, all parties appear to agree that the first aperture follows the feeder cable. Right?

A. That's correct.

Q. Now we're looking at the second aperture, though. And for the second aperture, is it correct that the Staff and Respondents agree that the second aperture follows the drop line where the drop line is the entire wire?

A. That's correct.

Q. All right. And then is it your understanding that Shoals and Mr. Brooks view this second -- I'm sorry -- view the second aperture as following what they view as the entire drop line, but Mr. Brooks and Shoals acknowledge that their -- their identification of the drop line ends at the nexus?

A. Yes, that's correct.

Q. So really Shoals and Mr. Brooks --

A. Sorry. Could you repeat that? I think their aperture ends at the start of the nexus and then the drop line ends -- just to clarify.

Q. Okay.

A. Yeah.

Q. Yes. Can you repeat that, please?

A. So Mr. Brooks thinks that the aperture ends at

the start of the nexus, and then the drop line continues to some indeterminate point within the nexus.

Q. And he views that endpoint as irrelevant?

A. Yes.

Q. All right. But when you look at the entire aperture, isn't it correct that Shoals and Mr. Brooks are really only looking at the second aperture as part of the pathway of the drop line?

A. That's correct, because, as I explained, he drew the drop line into the nexus, but the aperture starts at the very beginning of the nexus, correct.

Q. Yes. And that part was part of Shoals' earlier modified construction, right?

A. That's correct.

Q. All or part of the pathway of a drop line?

A. Exactly.

Q. So they really weren't applying all of the pathway of a drop line. They were really applying -- Mr. Brooks was really applying part of the pathway of a drop line?

A. Yes, and that's exactly what I was trying to explain on my direct. That's correct.

Q. Okay. If we go to slide 38, this is what I wanted to show you earlier. This is a demonstrative where you have two drop lines coming into the joint on the same

side.

A. That's correct, yes.

Q. And so technically, you could say that each of those drop lines is electrically connected to the compression lug at a specific point of the nexus.

A. That's correct, yes.

Q. And we've seen -- I don't want to go on the confidential record -- but we've seen images or pictures where that is possible in reality.

Is that fair to say?

A. That's correct, and I heard testimony earlier this week that that was actually a Shoals variation.

Q. I mean, yeah, please, we don't want to go on the confidential record -- we can, but I'm just trying to stay on the public record.

A. Sorry.

Q. But it is certainly possible to design a product like this where you have two or more drop lines on the same slide where the wire only goes partially through the undermold.

A. Of course, yes.

Q. I mean, it's not like the construction that Staff and Respondents are proposing or proposing something that's like nonsensical or not realistic?

A. Correct.

MR. SHIN: Thank you, Dr. Cameron. That's all the questions I have for you.

REDIRECT EXAMINATION

BY MR. CHAIKOVSKY:

Q. Dr. Cameron, you have experience in injection molding?

A. I do, yes.

Q. You have a lot of experience?

A. Yes, I do.

Q. Do you consider yourself an expert in injection molding?

A. I would, yes.

Q. And both Shoals and Voltage products are made using injection molding?

A. That's correct, yes.

Q. In fact, the mold that is of the claims and applied to these products both of Shoals and of Voltage would be made through injection molding?

A. That's correct.

MR. HARRIS: Objection, he is leading the witness, Your Honor.

JUDGE BHATTACHARYYA: Mr. Chaikovsky, do you have a response?

MR. CHAIKOVSKY: I'll rephrase the question.

JUDGE BHATTACHARYYA: All right. Let's strike

the last -- the questions and answers from "and both Shoals and Voltage products are made using injection molding," onwards to the current time.

And now, please.

MR. HARRIS: Thank you, Your Honor.

Q. How are Shoals and Voltage products and their molds made?

A. Those products are made from injection molding.

Q. And, therefore, your expertise in injection molding would be relevant to analyzing the claims?

A. Of course.

Q. Is it your opinion that you require solar industry expertise to analyze whether there are apertures in a mold?

A. Of course not.

Q. To your knowledge, are there any differences in the alternative design product provided to Mr. Brooks and the alternative design products you CT scanned?

A. No.

Q. Did Mr. Brooks identify, during the course of this investigation, whether through the report, deposition, or his testimony, any differences between your CT scans and the product analyzed?

A. No, he didn't.

Q. You were asked some questions about the mold

limitations in the '153 patent by Shoals' counsel.

Do you recall that?

A. I do recall that, yes.

Q. And, in fact, he asked you about the outer mold of the alternative design products.

Do you recall that?

A. I do, yes.

Q. Okay. Let's take a look, actually, at the three permutations in claims 1, 21, and 24.

In any of those permutations, does the outer mold fully encase the nexus in the alternative designs?

A. No.

Q. Okay. And how about with respect to substantially sealing from external environmental conditions, and, in fact, we'll put back your demonstrative you used during your testimony, which is RDX-2C.68, hard to see here, is it your -- do you have an opinion one way or another -- oh, excuse me, Your Honor. That slide should be on the Voltage confidential record.

JUDGE BHATTACHARYYA: Move to the Voltage confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

A F T E R N O O N S E S S I O N

(In session at 1:30 p.m.)

JUDGE BHATTACHARYYA: Please be seated.

Let's go back on the public record.

MR. COYLE: Good afternoon, Your Honor.

Very briefly I just wanted to note for the record that Voltage does not object to Shoals' request to designation the transcript at page 1027, line 22, through 1028, line 11, as confidential.

MR. SHIN: There is no objection from the Staff.

JUDGE BHATTACHARYYA: Then those pages can be redesignated as confidential.

Do you need anything further?

THE REPORTER: No. Thank you.

MR. YEN: Good afternoon, Your Honor.

JUDGE BHATTACHARYYA: Good afternoon.

MR. YEN: Bruce Yen for Respondents. And our next witness will be Dr. Thomas Kenny.

THOMAS KENNY,

having been first duly sworn or affirmed on their oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. YEN:

Q. Good afternoon, Dr. Kenny.

Have you prepared a set of slides to help walk us through your opinions today?

A. I have. Could you speak up a little bit?

Q. Sure.

A. Thank you. Yes, I have.

Q. I see your slide 1. Could you give the Court a bit of your background?

A. I would be happy to. So I am a professor of mechanical engineering at Stanford University. I've been at Stanford for about 30 years. I'm also currently appointed as the senior associate dean of engineering for student affairs, which has me involved with admissions and financial aid and other policies.

My background includes a Ph.D. in physics from the University of California at Berkeley, and also a bachelor's degree in physics from the University of Minnesota.

Q. How long have you been teaching at Stanford?

A. I've been at Stanford for about 30 years, in fact just over 30 years now.

Q. I see you have additional sort of work-related high-tech experience?

A. Yes, I have. So over those 30 years in my professional career I've had the opportunity to participate in some startup companies that I cofounded. Cooligy was a company associated with or concerned with liquid cooling for microprocessors. Applaud Medical makes new technologies for treatment of kidney stones.

And perhaps the most relevant, I was the founder and board member of SiTime. SiTime manufactures micromechanical silicon-based timing reference for consumer electronics devices. It came from technology that was developed in my research group at Stanford, and went off to be a startup. It is currently on the NASDAQ. And I would imagine there's at least 100 SiTime oscillators in the room. If you have a Fitbit or a smartwatch like that, yes, an example, controls timing for electronics displays, it's in smartphones. It's really well-established. Very proud of that work.

Q. In addition to your work in commercial high tech, do you also teach any classes with any sort of practical application?

A. Yeah. So in the mechanical engineering department I teach courses on sensors and what we call mechatronics. And mechatronics is basically a descriptor for robot building.

We take undergrad students from various

disciplines in Stanford, sophomore, junior, seniors, plus grad students, and they get about seven weeks of content on things like microprocessors, batteries, power supplies, voltage regulators, diodes, sensors, and some software. And then in the last three weeks of realtime in the class they form a team of four, and they build a robot pretty much up from scratch.

We have components in a stockroom, but no sort of tab A, slot B assembly. It is very much completely designed from the ground-up experience.

The students learn to put together the mechanics of the robot. They learn to write the code to make the robot execute an autonomous task. And they have to design and build all the electronics.

You see here, the two green rectangles that are kind of top left on the robot are batteries. There's connectors that come off from that that lead to a power distribution system within the robot. They have fuses to protect everything from wiring mistakes and voltage regulators to deliver different currents and voltages to different elements of the system.

It's part of what we teach in the class. Students build crazy things. They make a lot of mistakes, and we fix them, and hopefully at the end of the day the robots meet their tasks.

MR. YEN: All right. Your Honor, at this time we would tender Dr. Thomas Kenny as an expert in physics and electrical and mechanical engineering and systems.

MR. MASCHOFF: Your Honor, we maintain our previous objection to Dr. Kenny being entered as an expert in this case, acknowledging that in your Order 26, he is not precluded from offering further testimony, but we just want to make sure that it's on the record that we maintain that objection.

JUDGE BHATTACHARYYA: I understand that you're maintaining the objection to him being a person of ordinary skill in the art.

Are you also objecting to his admission as an expert in the fields of physics and electrical and mechanical engineering and systems, subject to that objection?

MR. MASCHOFF: Correct, Your Honor.

JUDGE BHATTACHARYYA: So you're objecting to his admission as an expert in any field whatsoever, including mechanical engineering?

MR. MASCHOFF: As opposed to the solar industry, yes.

JUDGE BHATTACHARYYA: Mr. Shin?

MR. SHIN: No objection from the Staff, Your Honor.

MR. MASCHOFF: Thank you.

JUDGE BHATTACHARYYA: Based on the current record, Dr. Kenny is admitted as an expert in the fields of physics and electrical and mechanical engineering and systems, and not ruling on whether he qualifies as a person of ordinary skill in the art. That is an issue that's open for further briefing.

MR. MASCHOFF: Thank you.

Q. Dr. Kenny, I see on the next slide it appears to be a summary of the opinions that we brought in today.

What are those opinions?

A. Yes. So we'll discuss initially the subject matter of the '153 patent, we'll talk about some 112, Section 112, considerations around the claims of the patent, and then I'll present opinions related to the Yamawaki/Shao combination with respect to invalidity of the claims of the patent.

Q. We'll start, then, with the subject matter of the '153 patent.

A. Yes.

Q. I see here on this slide on the left side it looks like claim 1.

Can you explain what you believe claim 1 relates to?

A. Certainly. So the patent, as supported by its

claims, refers to technologies for solar energy installations, which include -- get my glasses on -- include connectors, wiring to central trunks and harnesses, and basically facilities and mechanisms for bringing current from a number of sources together onto a single cable.

So what this really comes to are different means for electrically coupling wires to one another in various arrangements, large and small.

The figures on the right show a couple of the illustrations from the patent describing the geometry and arrangements of some of these electrical connections.

Everything that's presented as far as the important details of these connections has to do with the geometry and the structural nature of the electrodes and the electrical contact between the elements.

Q. I think you may have a pointer there in case you thought about using that.

A. Okay. So we're talking about Fig. 7 and Fig. 35 from the patent.

And the descriptions to go with that, which purely describe the electrical connections and the structural arrangements that provide those electrical connections.

Q. And the latter half of the claim, what does that relate to?

A. The second half of the claim, shaded over here in gray, describes molding structures that encase the electrical connections, to protect them from the environment. There are geometric features associated with the mold, which we'll talk about at length, the apertures and the positions of those apertures.

And then the last part of the claim refers to an overmold, which is a secondary mold on top of the undermold. And as we show on the right, here's two examples from the patent, figures showing the undermold and overmold representative structures.

Q. And did you consider whether these concepts are new or old?

A. So obviously electrical connections and molding are not new, and no one is asserting that those were invented in this patent. Here's some samples that are representative of the kinds of electrical connections that are described with respect to the patent.

Upper left is a patent issued to Thomas Edison, in which some description of soldering processes are described, from over 100 years ago.

The upper right, a patent from about fifty years ago describes the use of a compression lug for making electrical connections in a structure.

The lower right shows examples of crimping, which

is a commonly used technique for mechanically attaching wires to connectors, and this dates back into the 1940s.

And splicing of cables has been around forever as well. Here is an example from 150 years ago describing the splicing of the transatlantic cable.

So all of the details associated with making electrical connections between cables and wires, drops and feeders and all the rest, these are all well-established methods from many, many years ago.

Q. And what about that second concept? Particularly, molding for electrical junctions, is that a new concept?

A. So the second part of the claim refers to molding. And just as background, molding of electrical connectors has also been around for many years. There would be many examples we could show. This one I find to be interesting, just because of some of the mechanical details that it brings along with.

So shown here in yellow in the illustration are four wires that will be brought together. The end of those wires are stripped and inserted into the openings of the molded structure, this being the molded structure here on the right side of the center, and this vertical structure also, pre-molded by injection molding.

There's a central kind of S-shaped element that

is a torsional crimp, and as described in this patent, you bring those four wires together into the two molded structures, and you press them together and twist the left side in a counterclockwise direction until they are aligned. The twisting process engages the four electrical wires into a common electrical crimp.

And so this, perhaps, complicated mechanical example, shows a way of forming electrical contact between four electrodes inside of an enclosure that's based on injection molding and using crimping.

The basic ideas here have been around a long time.

Q. The '153 patent, did its inventor, Mr. Solon, believe he invented any of these concepts?

A. In his deposition there were questions about what he considered to be the main invention of some of his work, and the component harness that he described in part of his deposition, which really relates to the wiring harness in many of these examples, is something that made a big contribution in the solar industry.

He describes the key elements of the component harness as window stripping, resistance welding, and then molding. And in this series of questions and answers he admits that he did not invent window stripping, he did not invent resistance welding, and the molding process also was

something that predated him.

The combination of those three things together created a wiring harness that was useful in the field.

Q. I'd note you've been here all week and have been listening to testimony through the week?

A. Yes, I have.

Q. All right. We've heard a lot about solar technology.

How does the invention of the '153 fit into solar installations?

A. So I think we have heard quite a bit about this this week. And just to describe the science and technology of what happens, in all the instances we've talked about there are solar cells arranged in solar panels that absorb solar incoming radiation. That incoming light has an effect in the solar panel that moves electrons around in different locations, creating voltage and energy inside of the solar cell captured from the sunlight.

The energy is then transferred from the solar cell to the inverter and to other useful applications in the form of an electric current, which passes along one portion of the harness and perhaps onto the lead assemblies and on to the inverter.

In order to maintain charge neutrality of solar the panels there has to be a return current that returns

along a complementary harness and is distributed back to the individual panels and individual cells of the solar array.

So this system in the middle, this arrangement of wires, are harnesses that capture and merge together the current from the individual solar panels, first onto the wires of the harness and then ultimately onto the lead assembly.

And then there's a complementary set of elements that distribute that current back out, first, on a thing that looks just like the lead assembly and then out through a series of wire harnesses and spreads that current back out onto the solar panels.

Q. And I've heard some mention of AC currents and DC currents.

What sort of current is created by solar cells?

A. The solar panels, when exposed to sunlight, which is mostly nearly constant, produces a constant current, a DC current. That current flows through these harnesses and assemblies all the way to the inverter. The inverter uses the current at the voltage to generate electrical energy in the form of oscillating currents and voltages, which is the common form for distribution within the household or onto the grid.

Q. With respect to the DC current that's created by these photoelectric devices, is it any different from DC

current that would come from, say, a battery or a fuel cell?

A. No. All of the things that are unique to solar happen within the solar panel. Once the -- once the current is on the electrodes of the solar panel, it passes through a series of connectors onto the wiring harnesses and the cable assemblies.

It's just electrons. And we know from physics that all electrons are exactly the same. There's no difference depending on where they came from.

Q. I'd also like to ask, so earlier with Mr. Brooks he testified earlier about -- when he was explaining something of a similar diagram as this -- he was talking in terms of carrying power, instead of current, like you've been explaining here.

Could you align or explain how those -- is that something you disagree with or is it just a different model?

A. I was -- I think Mr. Brooks made it sound more complicated than it really is. There's certainly power in this system. Energy is generated at the solar panels. Energy ends up being delivered to the inverter and delivered into the grid or into the household.

The power itself is seemingly a more nebulous quantity, and I think frankly not something that we need to be worried about. The system is dependent on the electrons, the currents that flow, the directions of those flows, and

the voltages that are associated with that. And that's everything that matters once we have exited the solar cell.

Q. And he also explained a little bit about how there's current being collected in, I guess, the bottom half of the figure and then current being distributed in the top half of the -- of that loop there.

Is there much -- is there much or any difference in the wiring and connectivity of the wiring between those two?

A. So the electrons, they flow where they flow. They don't particularly care whether they are being combined or distributed. The harnesses that are associated with the positive and negative sites of the installations are the same product. There are fuses on one side and not the other. That's the only real difference.

And so the cable junctions in the lead assemblies and in the wire harnesses are equally capable of gathering current together onto the larger wires from small wires or distributing current from large wires back out to small wires.

Q. Okay. And so where does the invention of the '153 patent fit into this?

A. It's really associated with everything between the solar panel and the inverter. The Fig. 1 of the '153 patent describes the prior art prior to the invention in

which strings of solar panels, signified with the number 30, are wired together into a single lead, which then is called a home run, a single wire that would run from that portion of the solar array all the way back to a combiner box.

And the way these were built in that time period is that you would have a single wire associated with small groups of solar panels, and if you had a large array you just had large numbers of these single wires running all the way back to the combiner box.

The combiner box, then, merged those onto a single DC feeder cable, with some switches and some fuses for protection, and then that feeder cable would go to the inverter number 38 on this drawing.

Q. How did Mr. Solon explain his invention?

A. So the idea of the harness occurred to Mr. Solon when he was visiting solar installations and talking with potential customers. And he came up with this notion of a component harness, which he describes as distinct from a wire harness that might have been in an automobile, for example.

And what he means by the component harness is a harness that specifically is designed to be the interface between solar panels and the combiner box. In this case, instead of having 15 wires from some number of solar panels running all the way back in parallel, he decided it made

sense to merge those wires onto a single wire and then connect that to a single larger fuse on its way to the combiner box. It's a very good idea.

Q. And is that what's going to be depicted here on Fig. 4?

A. Yeah. What we're looking at in Fig. 4, which is descriptive of the invention of the patent, are two stages of processing of the currents from the solar panels. So, again, we have these individual strings connected to inputs to the 34 item, which is the wire harness of the patent, and then the wire harness has a number of these -- of these branch cables that come together and are joined at these little rectangular junctions.

And as each of these together is added to the wire harness, each of them brings current, which adds up, as we show here in a little bit larger view, we have individual currents from each string of solar panels being deposited through different wires onto the wire harness.

And what we're depicting here with the red arrows are the currents from each small group of solar panels being added up as they progress through the wire harness to the end of that harness.

Then we have a second structure called the lead assembly, which is the focus of this patent. It has drop lines, which connect to the outputs of the wire harnesses

and gather current from each wire harness. And along the lead assembly, you basically add up this current as you work your way down. Each lead assembly deposits its current onto that -- onto that feeder cable.

And here again the representation of the red arrows is attempting to use the width of the arrows to reflect the amount of current at that location.

The key point here is that you start with small amounts of current from the solar cells, solar panels, those get combined into maybe a medium-size current at the end of the wire harness, and then that medium current is merged with other medium currents from other wire harnesses to a single very large current that proceeds down the feeder cable onto the inverter directly.

Q. In terms of operation, do the wire harness and the lead assembly operate similarly or the same?

A. Operate exactly the same. In each case the really only difference is the scale. The size of the currents that are being combined into the combiners, I'm sorry, into the various cable junctions are larger in the lead assembly than in the wire harness. And, therefore, it's appropriate to use larger diameter cables, but, otherwise, it's the same basic electronics and mechanics taking place.

You've got small wires connecting to larger

wires, then connecting to even larger wires, merging small currents into medium currents and eventually to larger currents.

Q. All right. In this figure it seems like -- it doesn't show up so well here, but it looks like it's pulling current from solar cells out of the cells.

A. Sorry. Can you repeat that?

Q. Is the current being shown here coming out of the solar cells?

A. Yes.

Q. You had earlier talked about a return path and coming back.

How would that operate?

A. So underneath the illustration on the right would be the inverter where all this current gets deposited. It's used to generate oscillating electrical currents and Voltages for home use.

All of the current, all of these electrons that arrive at the inverter have to be returned to the solar cell. So there is a complementary assembly of both a lead assembly and a complementary set of wire harnesses that take that current backwards from the inverter through a distribution process of dividing large currents into medium-sized currents at the end of the lead assembly and then depositing medium currents onto a number of wire

harnesses, which then distribute small currents back to each individual solar panel.

Q. And would the arrows in that case just be reversed?

A. Everything would be exactly the same except the direction of the arrows. You would start with large currents, gradually medium currents, and then smaller currents. And this is not anything magic to the solar industry. You absolutely have to return all the currents to their sources.

Q. What's depicted in Figs. 27, 39, and 31?

A. So this is showing some illustrations from the patent. Here in Fig. 27 we see the complementary pair of lead assemblies that are associated with bringing power from a solar installation to an inverter.

The inverter in this case would be on the left, and we would be taking current from solar panels through wire harnesses and onto the drops that feed onto the lead assembly, and those are indicated by the green arrows coming up from the bottom.

Again, as we've been discussing, the current ends up on the feeder cable, some more current and some more current, finally a very large amount of current going back to the inverter.

And then the return path. The current has to

return from the inverter and it gets delivered back out through these drops, eventually, to wire harnesses and all the way out to the solar panels. These are the arrows shown in red.

Q. And Figs. 39 and 31?

A. These are illustrations from the patent describing a single-drop and a dual-drop lead assembly. These are examples of the structures -- sorry -- I didn't mean to click forward there.

These are structures that are examples of the individual cable drops that are represented in Fig. 27.

Q. Having analyzed this patent, and I see claim 1 is still on the left side there, how significant is knowledge about the operation of solar cells to understanding this invention?

A. It's really not. The solar cells deliver current at a nearly fixed voltage. If you have lots of solar cells, you're adding them up to gather all that current into a convenient series of cable harnesses and eventually onto a lead assembly and a single feeder cable.

Everything that goes on in the cables, in the assemblies, and everything that we're talking about today, and all week for that matter, is all just basic electron flow through ordinary or maybe specifically designed components, but doing ordinary things with the current and

the voltage.

Q. I think we have already mentioned this. Under Order 26, there's a question of whether your qualifications would render you one of ordinary skill in the art.

Do you believe you're one of ordinary skill in the art?

A. I believe so. I think the understanding necessary to interpret the elements of the patent, which are connectors, cables, and the like, are well within my educational experience and my other experience. So yes, I do.

Q. There's been a number of understandings that have been presented in this investigation. We've listed four of them here on the Markman Order, Respondents' contention, Staff's contention, and Complainant's contention. It seems like at least the first part of each of these indicates some requisite level of academic experience.

With your Ph.D. in physics, do you think you meet this qualification?

A. I do. And it isn't just the Ph.D. and physics. It is 30 years of education and teaching experience at Stanford. Every time I teach I learn. And so my educational background is really the aggregate of my degrees plus 30 years of teaching experience at Stanford.

Q. And then the next part of each of these

understandings of one of ordinary skill in the art includes some requirement about some subject matter.

Could you go through each of these and explain whether or not you meet each of those requisites?

A. So each of these has a different description of particular work experience, and I freely admit that I have not had two years working experience in photovoltaic systems or that I've not had at least two years experience working in industrial solar power installations. I do believe I meet the middle portions of the Staff and Respondents' construction. And, frankly, I believe the claims and description of the technology in the patent is well within the educational background and my experiences.

Q. I see the term EBOS in the Complainant's contention.

What's your understanding of EBOS?

A. Yeah, so EBOS is a term that's used in the solar field to describe the family of components that connect solar panels to the inverters. This includes all of the cables, wires, and connectors that we've been talking about this week. And it's a term used in the field to describe that collection of components.

Q. EBOS excludes the solar panels?

A. Yes, the solar panels are not in that category.

Q. Okay. So it starts with the wiring.

A. That's right. It starts right with the electrodes on the solar panels and goes forward.

Q. And, of course, there is just about always a caveat indicating that more education can substitute for experience and that experience combined with training could substitute for formal education.

Under this prong, do you believe you meet one of ordinary skill in the art?

A. Yeah, all four of these definitions include the recognition that education can substitute for experience. As I mentioned earlier, I've got quite a lot of education. I think more than enough to substitute for some of the particular experience. And, in particular, given the content of the patents, I think I'm in a position where I fully understand what we're talking about this week.

Q. Let's move on to Section 112 considerations.

JUDGE BHATTACHARYYA: Mr. Yen, I'd like to ask a follow-up question of Dr. Kenny.

MR. YEN: Of course.

JUDGE BHATTACHARYYA: Dr. Kenny, can you tell me the extent and basis of your familiarity --

A. I'm sorry?

JUDGE BHATTACHARYYA: I'm sorry. Could you explain to me the extent and basis of your familiarity, if any, with photovoltaic systems?

A. Sure. So as part of my education in physics, I took classes and used solar and other related semiconductor devices in which electrons flow through band structures and where energy can be applied, either through photons or other means, thermal means perhaps, to excite carriers over certain barriers and make them available for extraction as a source of energy.

That semiconductor physics is well in the middle of the Ph.D. work that I've done, and frankly I've been working on semiconductor devices in my research at Stanford for 30 years.

JUDGE BHATTACHARYYA: Thank you.

Q. It occurs to me, earlier in the diagram when they were showing the photovoltaic cells, were those p-n junctions? Is that the link to semiconductor --

A. Those are in the middle of all these solar panels. They are diodes, basically. In the normal arrangement, if you have a diode, current will flow readily in one direction and not so much in the other direction.

If you apply sunlight to diodes, particularly diodes with the right engineering, that allows current to flow in the opposite direction and deliver energy at the same time.

Q. If we turn back to, let's see, Order No. 16, at the bottom, is it your understanding that given this current

state of the record, the issue of indefiniteness may be revisited after the evidentiary hearing?

A. It's important, of course. My understanding of the most recent orders are that the evidence does not clearly and convincingly show that the aperture terms are indefinite. Given the current state of the record, my understanding is that there's a lot been said. I'm sure you've listened to all of it, and perhaps been influenced. I think the idea is that this issue will be revisited after the hearing and perhaps decided then.

Q. And do you have an opinion based on your expertise as to whether or not the aperture terms are indefinite?

A. Yeah, my opinion is that the terms are indefinite, and we'll be talking about that in the next few minutes.

Q. So what did you do in determining whether or not the aperture term would be indefinite?

A. Anytime one's understanding the terms of a patent, and particularly the claims of a patent, one reviews the entire patent. And in this case, if you read the specification and look at the figures of the '153 patent, the word aperture is mentioned only once anywhere in the entire specification. And it relates to this exterior sort of loop feature outside the overmold that is intended to

provide a location for securing the assembly with zip-ties.

Outside of this single mention of aperture, there is no other place in the specification that describes what apertures are or how they might be used.

Q. And is this, I guess, zip-tie aperture related to or the same as the claimed apertures?

A. I think it's -- so the apertures of the claims are referring to structures associated with the undermolds. This is an overmold structure, and I think it's obvious based on all the discussions we've had today that everyone understands the apertures that are of discussion this week have to do with something other than this structure No. 25.

Q. All right. So what else did you consider in considering whether the aperture terms are indefinite?

A. So aperture arose in the prosecution conversation between the Examiner and the patent owners. At the end of already several years of claim revisions, claim rejections, and this was an email message from the Examiner to the legal representation for Shoals offering a substantial amendment to the claims that, if adopted, would allow the claims to be allowed.

What appears here is a lengthy description of a number of new features and limitations associated with a structure called a first aperture and a second aperture that are, in the view of the Examiner, sufficient to distinguish

the claims from the prior art.

Q. And did you glean any sort of understanding as to what aperture may mean from that?

A. In the prosecution that took place after that claim was amended there is no further description of how that term or any of its associated language compares with any of the prior art.

And it's clear that even between the Patent Owner and the Examiner that there was no exchange of information that would lead to a further understanding of what the Examiner intended when they introduced this term.

Here we see deposition transcript from Carla Gannon, who was the prosecution attorney for the '254, add admitting that she didn't know in any detail what the Examiner intended with this new set of limitations.

Q. All right. And in looking at the specification were you able to glean any sort of information about aperture?

A. So in thinking about what an aperture is and how it might extend partially through, again, you go back, and there's nothing in -- anywhere in the background or figure captions of the patent that would help explain what this is. The detailed description is only about a single page of patent, two columns in its length, and it doesn't provide any helpful description of what this might be.

The claims include the language suggested by the Examiner, which was adopted by the Patent Owners, and but no real elaboration is present in the claims to help us understand what this is.

So what's left are the figures, and there are 61 of them, and they are potentially helpful in understanding what it is the Examiner thought was disclosed by the patent that could be covered by these limitations.

A lot of figures don't help at all. For example, Fig. 61 is a crimp. It is not related to apertures. So if you go through and look for just illustrations that might be indicative of what an aperture might be, you end up with a few that can help.

Q. And you've said you've been here all week.

Did you hear the testimony of Mr. Jeffrey Tolnar?

A. Exactly. So both Jeffrey Tolnar and William Brooks, experts for Shoals, answered questions about what they thought an aperture meant, and none of them had any prior experience with that term in their many years of experience in the solar industry. It's a new construction.

Q. Do you believe it's a word that's not commonly used in the solar industry?

A. The word is --

Q. Not commonly used in the solar industry?

A. It is not commonly used or they had never heard

it before in this context.

Q. So turning back to Order No. 16, is it your understanding that aperture has largely been agreed by the parties to correspond with the pathway?

A. That's right. So in order to understand how we might think of this term, we together have had a lot of conversations. There's been discussion at Markman hearings and elsewhere. We've heard from quite a few.

Out of all of that, there seems to be a few tests that have risen in the conversation that one might use when looking at a hypothetical structure to assess whether or not it was covered by the claims of the patent.

Q. All right. Are these --

A. We'll discuss these four tests.

Q. Let's start with the See Through Test.

A. The first test, when I first visited Shoals or, sorry, first visited Voltage last June and looked at some examples of their assemblies and was thinking of this patent, the word aperture, to me, at least suggested an optical kind of sensibility. So started thinking about what that might mean as far as the ability to see through a structure.

So the See Through Test reflects some of that thinking. And the notion here is that, if you have something like the feeder cable of the samples that we've

been talking about, it leads in a straight line through the assembly from left to right. And the See Through Test would show an opening through that you could easily see through. That would pass the See Through Test.

Therefore, it would not be partially through; it would be completely through.

Whereas a lot of the drops that we've considered change direction once they enter the mold, and because of that it changes in direction. There's no optical pathway from the entrance into and all the way through the outside. So those would be partially through according to the See Through Test.

Q. Are --

A. Other tests were discussed in the Markman hearing. So, for example, what I will call as the Cable Test leads to a belief that the right way to determine the aperture is that you follow the cable that forms the aperture.

And it wouldn't be just part of the pathway; it would be the entire pathway of that cable.

Q. Can you explain how the Cable Test is applied to this structure or these structures?

A. So here's two examples of two different structures, one where there's a single-drop lead going all the way through from left to right, through the crimp and

along the side of the feeder cable. And a different example where there's a pair of wires coming in that are -- that are connected to the crimp but not to each other.

And if we apply this test, is a Cable Test, if we remove a cable, leave an aperture that extends completely through, what we would see is that the single cable that was applied would lead to an aperture that does extend completely through the entire structure.

Whereas, the two separate leads bonded together would lead to apertures that didn't extend partially through.

Q. And for the Cable Test, is it possible that a molded structure could include apertures that extend completely through and there could also be apertures that extend partially through?

A. Yeah. That's definitely the case. And, really, some of the distinction arises from what was the original form of the cable prior to the assembly process. Was it a single cable, a single connection from left to right, or was it two separate wires at the start of the assembly process?

And the distinction here is that the single cable version would lead to an aperture that would extend completely through; whereas any construction that began with two separate elements would lead to a situation where the aperture is only partly through.

Q. Could you explain the Start of the Nexus Test?

A. Yes. So I understand from the Markman hearing there was discussion based on a proposal by Mr. Barquist that the pathway starts at the nexus and extends only outwards in that direction, that there's no possibility of a pathway passing through the compression lug.

And so if we applied that test to these two examples, we would determine that the upper case, the pathway would end at the beginning of the lug, and so you would be partially through the entire structure, and that the pathway for the two separate wires would have the same result.

Q. For the Start at the Nexus Test, would it be possible to have molds that have an aperture that extend completely through?

A. So as Mr. Brooks explains, based on our interpretation of what this test would mean, it really is almost by definition that any -- any aperture -- sorry -- any cable that encounters a nexus necessarily is terminated at the nexus and that the aperture associated with that cable would also end at that same location.

As a consequence, the termination where the aperture is partly or completely through is entirely resolved once you know that you have a cable and a nexus. It reads out all of the other elements of the claim

limitations.

Q. The Effective Physical Path Test, could you explain this test?

A. So this one is a little more nuanced, but I understand it arose in the discussion at the Markman that, when the cable associated with the drop enters the compression lug and the lug is crimped, the cable is crushed and distorted in a way that makes it essentially disappear within the lug.

And then in that regard there would no longer be a physical pathway associated with that wire, and, as a result, therefore, no longer an aperture that could pass all the way through the lug.

Q. Could you explain that with respect to these two --

A. Yeah, so in this case you would start with this arrangement, and then when you applied the crimp and then attempted to remove the wire, you would have a problem near the center because the wire in this, at least as described by Mr. Barquist, becomes indistinguishable from the feeder cable, and that if you can't tell them apart and you can't pull them apart, then there's no way to do this path test, and, as a consequence, the aperture can't possibly extend anything except partially through.

Q. I think you already answered my question, but for

the Effective Physical Path Test, is it possible to have a structure or, sorry, a mold with an aperture that would extend only -- that would extend completely through?

A. In fact, no. As described by Mr. Barquist, it's really a definition of what happens under their understanding of the crimping process. The wires are -- they disappear. They are completely merged or dissolved into the rest of the system, and the absence of a physical object that passes through prohibits the understanding of there being an aperture that could pass all the way through.

Q. In the interest of time, I think you've identified here a number of different structures and how they would perform under each of these tests.

If we could run through quickly, and maybe just describe the structure.

A. Yes. So this just summarizes, for the example of a wire that starts out as a single wire that is placed into the compression lug along with the feeder cable, we see that the test of whether the aperture is partially through is partial through for the See Through Test, completely through for the Cable Test, and partially through for the Start at the Nexus Test and the Effective Physical Path Test.

If we consider a case where you have a second wire that is -- that goes straight through but it is not pressed into contact with the feeder cable, these tests, the

first one, we would say, that the See Through Test would say that aperture is completely through. The Cable Test is still completely through. But the Start at the Nexus Test and the Effective Physical Path Test would say it's partial because of the definition of those tests.

Q. And the next figure?

A. This is an example where you start with two separate wires and you bring them more or less together into the crimp, end-to-end, and then form the crimp.

And in this case, if you did that properly, the aperture that would result would be completely through, in the See Through Test, but for the other three tests you would have an aperture that was only partway through.

Q. And this last?

A. And the last, you have two wires that are not physically in touch with each other end-to-end but just placed separately within the crimp, all four of these would lead to an aperture that is only partway through the mold.

Q. This seems to be a summary. Could you summarize your --

A. Yes, this summarizes at a higher level all of what we just talked about. We have at least four tests. Perhaps more of them will be proposed and discussed in the further examination.

Smart people have said lots of things about all

of these, but over the -- over the course of all of it, it's not obvious to me that a person of ordinary skill in the art would automatically arrive at one particular construction. It's going to depend a little bit on your experience and maybe other factors, but to me it seems as though there is no reasonable certainty that a person of ordinary skill in the art would be able to tell whether a particular hypothetical structure was covered by this patent.

Q. So despite the fact that you might not know exactly which test to choose, are there any of these tests that raise any particular issues?

A. I would say that the two tests on the right, the Start at the Nexus Test and the Effective Physical Path Test are problematic because they are -- pretty much provide this determination that the apertures are partway through almost by the definition of the test.

Mr. Brooks admits that there's no possible structure that would ever lead to a complete pathway through the aperture that included the nexus.

So any system where you had a cable that came in and made electrical contact at a nexus would necessarily produce an aperture that could only be partway through.

In going in this direction, you're ignoring most of the 130 words that the Examiner provided along with this new concept of a first and second aperture. And zeroing in

on the fact that if it's an element that introduces itself to the nexus in one way or another, it necessarily can only go partway through.

Q. All right. And that brings us to your third major point that you'd like to discuss.

A. So we'll discuss Yamawaki and Shao, the combination of these prior art references, and my opinion that they invalidate these claims of the '153 patent.

Q. And for your analysis of that -- of your 103 analysis, did you consider the Court's claim constructions?

A. Sorry. Again?

Q. Did you consider the Court's constructions?

A. Yes, I did.

Q. What do we have on this timeline, Dr. Kenny?

A. So this slide is basically just laying out the timeline of the prior art and the prosecution history of what became the '153 patent.

We'll look at the Yamawaki patent that dates back to around 20 years prior to the filing of the '153, a continuation off of the '254. And we'll look at the Shao patent, which also predates all of these filings by more than ten years.

Q. On this slide it looks like you're depicting the cover page of U.S. Patent 6,268,559 B1.

What is this?

A. Yes. This is a patent we'll describe as the Yamawaki patent through the rest of my presentation.

It's title is --

(Clarification requested by the court reporter.)

A. We'll describe this as the Yamawaki patent through the rest of my presentation. Its title is "Photovoltaic Generation System, Wiring Apparatus for Photovoltaic Generation System, and Wiring Structure Therefor." And it was filed in 1999, as I mentioned earlier.

Q. It may be obvious, but does this patent relate to solar technology?

A. It does. As we'll see, it describes the use of solar panels to generate energy in a solar installation.

Q. And was Yamawaki considered during the prosecution of the patent application that eventually led to the '153 patent?

A. Yes, it was. It was considered as part of the prosecution history of the '153. At the time of the -- or near the end of that prosecution history, the Examiner let the Patent Owners know that if they adopted the language of claim 10 into the language of claim 1, that that would lead to an allowable claim, and the key features of claim 10 that led to that allowance where the introduction of the third aperture associated with the second drop line. All the

other limitations of the first claim are covered by the prior discussion in the prosecution history.

Q. And is that what the applicant did?

A. Yes. Pretty much the Office Action that made the suggestion was March 3rd. The applicants responded on March 10th. And the patent issued just a week or so later.

Q. To be clear, was this originally rejected over Yamawaki alone, or was it in combination with another reference?

A. Yes, it was in combination with a reference called Vander Ploog, which was an electrical connector reference outside of the field of solar installations.

Q. I see on this slide we've got the front page or excerpts from the front page of CN 2785100Y.

What is this?

A. This is a patent that we'll call the Shao patent. It was filed in January 2005. And it's titled "Power branch with bidirectional K-shaped branch."

Q. Does Shao relate to solar technology?

A. Sorry?

Q. Does Shao relate to solar technology?

A. There's no mention of solar technology in the Shao patent.

Q. All right. What does Shao relate to?

A. Shao relates to power distribution in electrical

wiring systems, and is, therefore, interesting to consider in that we're concerned with power distribution and power combining in the case of the '153.

Q. Okay. On this slide we see on the left side the '153 patent claim 1 with the first limitation highlighted.

Does Yamawaki disclose a lead assembly for use in a solar energy installation?

A. It does. Yamawaki describes wiring apparatus and wiring structures for conducting electric power associated with photovoltaic cells into the generation system of buildings.

Q. The next limitation, does Yamawaki disclose a drop line terminating at a drop-line connector?

A. So in Yamawaki, there's a description of branch cables connected to a trunk line. These branch cables and branch cable connectors are the elements that meet the limitation of a drop line.

Q. Does Yamawaki disclose the drop-line connector configured to connect with the central trunk of a wire harness, the central focus of the wire harness having a plurality of branches that each are configured to electrically connect to a separate solar panel contained in an array of a plurality of solar panels?

A. Yes, it does. So in this illustration, if we look up here on the upper left, the drop line is shown in

yellow with the drop-line connector connecting to a wire harness that's highlighted in orange.

Not details of how the wire harness is connected to the solar panels here, but it's clear from the description in Yamawaki that that wire harness captures current from the individual solar cells in a solar array.

Q. Does Yamawaki disclose a feeder cable electrically coupled to the drop line at a nexus?

A. It does. In this case the feeder cable is item 31, which it describes as a trunk cable. And that passes through these cable junctions and is electrically connected to the drop line.

(Clarification requested by the court reporter.)

Q. Does Yamawaki disclose an undermold that fully encases the nexus?

A. Yes, it does. There's a structure that it refers to as a molded body of electrically insulating synthetic resin material that is on the interior of this housing associated with the cable junction in Yamawaki. It meets the limitation of an undermold.

Q. Does Yamawaki disclose a first aperture extending completely through the undermold and having a first diameter, wherein the feeder cable extends through the first aperture along a first longitudinal axis?

A. That's correct. So the aperture of the --

associated with the feeder cable, which Yamawaki describes as a trunk line, is shown here left to right through the cable junction, which has an aperture associated with it.

Q. Does Yamawaki disclose a second aperture extending partially through the undermold and having a second diameter different than the first diameter, wherein the drop line extends from the second aperture along a second longitudinal axis?

A. It does. So Yamawaki discloses a second aperture associated with what it calls the branch cables. That second aperture has a second longitudinal axis.

Yamawaki itself doesn't describe the diameters of the cables, but as I explained in my report, one of ordinary skill would understand that it's often convenient to have the branch cables be smaller than the trunk cables just because of the increase in the current that's carried in the trunk relative to the branch.

Q. Does Yamawaki disclose an overmold surrounding the undermold and forming an undermold-overmold interface at an outer surface of the undermold?

A. That's correct. In this case the overmold structure of Yamawaki is described as a cover member that covers the outer surface of the body 33E. And, therefore, meets limitations of the overmold limitation.

Q. I think that brings us to whether Shao meets some

of these limitations.

Does Shao disclose a second aperture extending partially through the undermold and having a second diameter different than the first diameter, wherein the drop line extends from the second aperture along the second longitudinal axis?

A. Yes. So Shao clearly meets this limitation. It describes a trunk cable, again, that is connected to branch cables for power distribution. The branch cables, as shown in this illustration, are smaller diameter than the trunk cable, and the aperture associated with those branch cables would, therefore, have a second diameter.

Q. Does Shao disclose a third aperture extending partially through the undermold and having a third diameter different than the first diameter, wherein a second drop line extends from the third aperture along a third longitudinal axis?

A. Yes, it does. In this case Shao provides branch cables, two of them, one to the left and one to the right, and the one in the right in this illustration is the one that we assigned to be consistent with the third aperture limitation of the claim.

Q. So your understanding is that you're looking at these two different references, but there must be motivation to combine them.

What is the motivation to combine Yamawaki and Shao?

A. There can be two different motivations. The first can be that the prior art references are from the same field, or in the second case, if the references -- one of them, it's reasonably pertinent to consider combining one reference with the other in order to obtain the benefits that are of mutual interest.

Q. And why would one decide to look at Shao in view of Yamawaki?

A. So as described earlier, Yamawaki is a patent that describes the wiring system for a solar installation. It's concerned with the necessary large number of electrical wires that might be present in such installation and that reducing that number of wires by various harnesses that can combine would allow it to be more easily laid or set up, and reduce the possibility of mistakes in the wiring.

It also improves the maintainability of the modules, and then further details in Yamawaki are associated with waterproofing of the junctions, which are all useful features for an outdoor solar installation.

Shao describes its utility model for its K-shaped branch connecter that helps reduce the number of outleads and, therefore, makes the system easier to mount and use.

And, further, provides description of the

benefits that include improvements in sealing moisture proofing, waterproofing, and improving the maintenance characteristics of the cable junction in Shao.

Q. And these kind of benefits and features, are they similar to the benefits and features sought to be improved by the '153 patent?

A. They are. The '153 patent discusses the benefits of reducing the large numbers of wires and cables that might be replaced with harnesses and lead assemblies, which also leads to lower costs and easier, simpler installations, better maintenance, and other benefits in the field. So these all relate to the same family of problems.

Q. Looking at the figure in the lower -- upper left-hand corner of Yamawaki, there are some dotted lines there.

How would those be filled in by Shao?

A. I'm sorry?

Q. How would those be filled in by Shao?

A. I'm sorry. Could you repeat the first part of that? Somehow there's --

Q. So looking at the figure in the upper left of Yamawaki, there's some dotted lines there.

How would those be combined with Shao?

A. So Yamawaki is describing a cable junction where you're connecting a branch cable --

(Clarification requested by the court reporter.)

A. -- connecting branch cables to a trunk line, and Shao is describing exactly the same thing, even using some of the same terminology of branches and trunks. So very similar in the basic construction.

Yamawaki provides sort of limited description of the interior structure of the cable junction. So one considering Yamawaki would look to -- Shao -- which provides a much more detailed of the interior structure, including the crimping and molding process around the cable junction that could be applied in improving the interior structure of Yamawaki.

Q. So on this next slide, it looks like we're looking at the front page of the '153 patent, and you've highlighted a few points here.

What is that?

A. So these are all things that are present on the cover pages of many patents. On the lower left there's a description of the -- some of the fields of classification that the Examiner utilized in their search for prior art that might be required to consider in the prosecution.

All of those classifications on the lower left relate primarily to solar, photovoltaic, semiconductor devices, and techniques for processing energy in such installations.

The classification areas on the upper left that are also considered in this patent are much broader and go on to include things in the categories of ordinary electrical wiring, power distribution, and cabling.

A particular example of this is the Vander Ploog reference, which the Examiner cited in prosecution, in combination with the Yamawaki reference at the last part of the prosecution history. And it was the combination of Vander Ploog and Yamawaki, it was overcome by the modification to include the second drop line and the third aperture.

Vander Ploog is itself specifically not a solar reference. It's entirely in the field of electric power distribution and cabling.

Q. Is there any reason to believe that the Examiner knew about Shao when he was -- when this patent application was being prosecuted?

A. So the Examiner looked in fields of reference that included Vander Ploog, and, therefore, things that had to do with cabling and power distribution. I would assume that the Examiner would have considered Shao, if it had come across his radar.

Q. But there's no record of Shao?

A. No record of Shao being considered in the patent, in the prosecution.

Q. And as we saw before, Shao does include a third aperture -- sorry -- a third aperture in a second drop?

A. (Nodding head up and down.)

So a little further detail of the classification areas that were searched in the patent. Again, this is kind of continuing off of the bottom of the list on the front page.

The Examiner cited a couple of other references also that were within this categorization of prior art that does not include solar but is exclusively limited to things around cabling and connectors.

Q. Do you recall, I think you already mentioned, that it was before the patentee received a notice of allowance, did the patentee argue that it should be distinguished from the combination of Vander Ploog and Yamawaki or did it simply accept the Examiner's suggestion?

A. So all of arguments in the prosecution never went to excluding references on the basis of their classification scheme. It was all around the geometries and structures of the connectors. And it was -- in this case it was -- overcoming this Vander Ploog reference was only achieved by adding a third aperture and a second drop line.

Q. And Keeven and Zahnen I see here highlighted.

Do they relate to solar power?

A. Sorry?

Q. Do they relate to solar power?

A. No, none of these added reference have anything to do with solar power.

Q. In fact, that H01R, what does that relate to?

A. Yes, this classification area, H01R, that is common to many of the references that the Examiner cited is exclusively about electrical connecting elements, coupling devices, which include things like crimping, soldering, welding, and molding.

Q. I think it looks like claim 21 of the '153 patent is now on the left side.

Does Yamawaki disclose a solar power system?

A. I think it's clear that Yamawaki describes a photovoltaic generation system for solar power.

Q. Does Yamawaki disclose a plurality of solar panels each electrically coupled to one of the plurality of branches of a wire harness to form a first solar array?

A. It does. Here, again, we have the -- referring to it as the wire harness connected to the solar panels on the left. And that ends up being part of the assembly of the entire system.

Q. Does Yamawaki disclose a lead assembly?

A. It does. Here the lead assembly would include the elements 16, 17, and 18, that connect the harnesses and solar panels all the way down into the inverter in the

house, which in this case is labeled as element 13.

Q. Does Yamawaki disclose a drop line electrically connected to a central trunk of the wire harness and configured to receive power from the plurality of solar panels?

A. It does indeed. The drop lines, as we mentioned with respect to claim 1, are these elements that extend from the cable junctions, and here in the larger schematic it's these elements that go from the wire harness connections to the connections to the feeder cable.

Q. Does Yamawaki disclose a second drop line electrically connected to a central trunk of a second wire harness and configured to receive power from a plurality of solar panels and in a second solar array?

A. It does. Here we see a pair of these drop lines in this assembly. The one on the left we might call the first drop line and the one on the right could be the second drop line connected also to the lead assembly.

Q. Does Yamawaki disclose a feeder cable, the feeder cable electrically connected to the drop line and the second drop line at a nexus?

A. So Yamawaki discloses a feeder cable, that would be the structure shown in blue that runs through all of this assembly all the way to the inverter. It's electrically connected to both drop lines. In this particular case it's

not connected at the same nexus. We'll rely on Shao for that feature in a moment.

Q. Does Yamawaki disclose a primary mold that fully encases the nexus so as to substantially seal the nexus from external environmental conditions?

A. It does, the same mold that we discussed moments ago, this element 33E, the molded body of electrically insulated synthetic resin material would meet that limitation.

Q. Does Yamawaki disclose a first aperture extending completely through the primary mold and having a first diameter, wherein the feeder cable extends through the first aperture?

A. It does. The first aperture in this case is highlighted in orange inside of the illustration from Yamawaki. It's aligned with the so-called trunk line of Yamawaki and feeds all the way through the enclosure.

Q. Does Yamawaki disclose a second aperture extending partially through the primary mold and having a second diameter smaller than the first diameter, wherein the drop line extends into the second aperture?

A. Yamawaki discloses a second aperture that extends partially through, as shown here. It terminates at its connection with the feeder cable. The drop line extends into that second aperture, and the second diameter

associated with this drop line would be something that a person of ordinary skill would consider to be an obvious possibility within the context of Yamawaki.

Q. Does Shao disclose a feeder cable, the feeder cable electrically connected to the drop line and the second drop line at a nexus?

A. It does. So in this case Shao has a feeder cable that it refers to as a trunk line, and it's connected to the drop lines 1 and 2 at the nexus under the crimp.

Q. Does Shao disclose a primary mold that fully encases the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further -- excuse me -- from external environmental conditions?

A. It does. This is element number 8 in the drawing. This molded structure that surrounds the nexus and the wires all the way through to where the insulation protrudes. It's described as a sheaf made of an injection molded material of injection molding grade.

Q. Does Shao disclose a first aperture extending completely through the primary mold and having a first diameter wherein the feeder cable extends through the first aperture?

A. It does. So this first aperture extends all the way through, associated with the -- extending all the way

through the primary mold.

Q. Does Shao disclose a second aperture extending partially through the primary mold and having a second diameter smaller than the first diameter, wherein the drop line extends into the second aperture?

A. It does. And important to note, Shao describes these two drops as being two separate wires that are assembled together with the feeder cable under the crimp. And, therefore, this second wire meets this limitation of an aperture extending partly through under all of the constructions that we've considered this week.

Q. Does Shao meet a third aperture -- disclose a third aperture extending partially through the primary mold and having a third diameter smaller than the first diameter, wherein the second drop line extends into the third aperture?

A. It does. In this case the second aperture is on the left and the third aperture is on the right. They meet the limitation for the same reason.

Q. I see here on the left side is now the '153 patent, claim 24. On the right side some figures from Yamawaki and Shao.

Does the combination of Yamawaki and Shao disclose claim 24 of the '153 patent?

A. It discloses all these limitations. The

arrangement of some of the details is a little bit different, but they are all present in both claims. In the interest of time, late on a Friday afternoon, I'll dispense with the line-by-line accounting and just submit that all the limitations are met by the combination.

Q. For the same reasoning as to claim 21; is that right?

A. That's right.

Q. All right. Dependent claim 12, does Yamawaki disclose a lead assembly combining power -- that combines power received from the plurality of solar panels and conducts that power directly to an inverter electrically connected to the feeder cable?

A. Yamawaki discloses this. It describes a number of embodiments where the solar panels are clearly a large number in their presence and, therefore, meets this limitation of a plurality of solar panels.

Q. Does Yamawaki disclose wherein the second drop line terminates at a second drop-line connector, the second drop-line connector configured to connect with a central trunk of a second wire harness, the central trunk of the second wire harness having a plurality of branches, each are configured to electrically connect to a separate solar panel contained in a second array of a plurality of solar panels?

A. It does. There's many ways to make this

limitation line up, so we could take a first array of solar panels and a second array of solar panels, a first harness, second harness, first drop line, second drop line, both connected to the feeder cable or, yes, to the feeder cable in this case.

Q. Does Yamawaki disclose wherein the lead assembly is configured to combine electrical power received from the array of solar panels and a second array of solar panels at the nexus and to deliver the combined electrical power to an inverter that is in electrical communication with the feeder cable?

A. Yes. That limitation is shown and described in the patent. Clearly we have an array of solar panels. We have lead assemblies that are configured and designed to deliver all of that power to the inverter. And in the more detailed description associated with Fig. 3, there are multiple arrays of solar panels, the one on the left and the one on the right, can meet the limitation of the first and second arrays.

Q. Does Shao disclose the electrical coupling between the feeder cable and the drop line and the second drop line at the nexus is secured with at least one of a compression lug, a solder connection, a splice and a crimp?

A. Yes. So Shao describes crimping for the formation of the electrical connection under the C-shaped

clamp, very similar to things we've heard about all week long and, therefore, meets this limitation.

Q. Does Yamawaki disclose a secondary mold surrounding the primary mold and forming an undermold-overmold interface at an outer surface of the primary mold?

A. To meet this limitation, we refer back to Yamawaki, which has the overmold described 33F as a cover member that covers the outer surface of the body.

Q. All right. We're at the end here, summary of opinions.

Could you summarize your opinions that you've presented today, Dr. Kenny?

A. Sure. So in my presentation we've discussed the subject matter of the '153 patent and the technologies that are described in the subject matter. The electrical connections and the molds that are described here are not limited to solar installations, not limited to utility-scale.

And I'll continue, I guess.

The asserted claims are invalid with respect to uncertainty over how to interpret some of the claim terms, and the Yamawaki/Shao combination invalidates these claims of the '153 patent.

MR. YEN: All right. Thank you very much,

Dr. Kenny.

I pass the witness.

MR. MASCHOFF: Your Honor, I have not yet introduced myself. I'm Eric Maschoff with Maschoff Brennan, appearing on behalf of Shoals.

CROSS-EXAMINATION

BY MR. MASCHOFF:

Q. Dr. Kenny, hi. How are you? Good to see you again.

A. Good to see you again.

Q. Dr. Kenny, obviously I have a couple of questions for you that I would like to follow up with.

You mentioned the concept of EBOS in your testimony.

And I'm just wondering, you explained what that is, and maybe you could do that again for me, what your understanding of EBOS is?

A. Certainly. I believe I said that EBOS is a descriptive term that covers all of the elements that lead from solar panels to the inverter in modern solar installations.

Q. So it's everything that happens between the solar panel and the inverter, essentially, is that a correct statement?

A. All the elements that are used to make those

things happen, so it's the connectors, the cables, the junctions, the fuses, all of what's there.

Q. And when the Judge asked you about photovoltaic, your experience with photovoltaics, you mentioned that your experience or your education was sort of on the semiconductor side of things and how the light photons are turned into energy.

Would that be part of the EBOS system or is that the front of the glass that you mentioned?

A. So it's not part of the EBOS system. It's what goes on in the solar panels that are --

Q. Okay.

A. -- that leads to the EBOS and on to the inverter.

Q. So when the Judge asked you about your experience with photovoltaics, you immediately went to the front of the glass as your experience and not the EBOS aspect of things, yes or no?

A. I agree that I didn't go to the EBOS aspect of solar photovoltaics, that's correct.

Q. Thank you. Thank you.

You offered an opinion of invalidity -- an invalidity report as part of your analysis, correct?

A. Yes.

Q. And that report, if I remember correctly, and I'm talking approximately, involved ten or so references; is

that correct?

A. I think --

Q. Maybe more?

A. So there were three patents, and one of those had to do really with in-line fuses.

Q. I'm excluding the in-line fuses.

A. The '254 and the '153?

Q. Correct, yeah.

A. Ten is a rough guess of the references that we considered at that point.

Q. And, roughly, 12 different combinations of theories in terms of invalidity of the '254 and '153 patent? Is that roughly correct?

A. That sounds about right.

Q. And you also had some interesting slides up. I think there was an Edison one and some other things.

Did you include those references as part of your analysis?

A. Of the invalidity?

Q. Yeah.

A. No, I did not.

Q. So those weren't introduced as a basis for invalidity of the claims?

A. I don't believe so.

Q. Okay.

A. I referred to them as background information just to explain the domain of --

Q. Yeah. But you implied there's lots of stuff out there, I guess is the point, correct?

A. Yes.

Q. If I understand correctly, watching your presentation, you have one theory of invalidity right now? Is that correct? Based on prior art?

A. So -- sorry, he stood up --

So one theory of invalidity based on the prior art combination of Yamawaki and Shao is what I presented today.

Q. Okay. Thank you. And in the process of arriving at your conclusions of invalidity in your report, I think we said ten references, 12 or so combinations, you talked about a number of aperture tests.

Did you -- in connection with your assessment of invalidity, and I think you concluded that all the claims are invalid in view of all those 12 combinations of art; is that correct?

A. At that time, yes.

Q. Did you apply each of your four aperture tests every time you made the assessment of whether or not a claim was valid or invalid?

A. That's a fairly substantial compound question.

Q. Well, I'm just wondering -- so I'll take a step back.

When you assessed the validity of a claim, I assume you first undertook to understand what that claim meant, correct?

A. Of course.

Q. And then you compared it to a reference that you considered to be relevant to that claim's validity?

A. That's correct.

Q. And in order to make the comparison you need to understand what the claim means?

A. Yes.

Q. So wouldn't you necessarily, by virtue of your four tests, need to run through all the tests every time to see if the claim is valid or not?

A. So the four tests that I described today, some of those emerged at the Markman hearing, and then were further discussed as part of the transcripts and the final decisions.

Q. But when you completed your report, you made conclusions of invalidity.

Are we to assume that you were able to understand the term aperture when you did that?

A. I don't think that's fair.

Q. But you still concluded that the claims were

invalid in view of those references?

A. Yes, I did.

Q. Okay. Thank you. You made another comment that I just wanted to follow up on.

You said you visited the Voltage factory to look at their products.

A. I did. It visited last June, early in the conversation or my involvement in the case.

Q. And you -- I think you said, don't let me put words in your mouth, correct me if I'm wrong, you had started thinking about the concept of aperture at that time?

A. I had read the patent, the '254 --

Q. As used in the patent, yes.

A. -- and that --

Q. Is that correct?

(Clarification requested by the court reporter.)

Q. And you mentioned that your first impression of the word aperture was as the term is used in the context of camera, I think you said, is that correct?

A. Optics.

Q. Optics, okay.

So was that assessment informed, is it fair to say, by your background in physics?

A. It was an early impression.

Q. But probably informed by your physics background,

is that fair to say?

A. Yes.

Q. So you aren't -- your initial impression wasn't informed by virtue of a background in solar components or solar energy installations, that sort of thing, your go-to knowledge base, is that correct?

A. I think so. And I think --

Q. Thanks. That's good enough. I do have a few more questions about your background.

So the presentation started with some good graphics of your background. I didn't notice the word solar or solar installation in any of those slides.

Did I not catch it or was it not there?

A. It was not there.

Q. Okay. And as part of your report I believe you attached a CV, a very impressive CV, by the way.

If I were to do a word search on that, would I find the word solar in that CV?

A. If you search just the titles of the papers and various things?

Q. Yes.

A. I think if you did that word search of the titles of all those papers, I would be surprised if the word solar popped up.

Q. Okay. Thank you. And I think you listed, it was

a lot, I think around 200 symposium, conference proceedings that you've participated in.

If I did a word search of all of those, would I find the word solar?

A. If you searched the publications or transcripts of what I said?

Q. Maybe just the titles of what you included in your CV?

A. I see. I think the same would be true.

Q. Thank you.

A. You wouldn't be asking me these questions if I had a gotcha answer, so I'll stipulate that you're probably right.

Q. And continuing on with your CV, you noted that, I think, over 50 issued patents that you're a named inventor on?

A. Yes.

Q. Also very impressive, by the way.

Anything solar related in any of those patents?

A. I'd be surprised. Again, I imagine you've looked too, so let's -- I'll say no.

Q. Okay. You've also testified as an expert in various patent cases, a number of them, I think.

A. (Nodding head up and down.)

Q. Have you acted as an expert in anything solar

related as a patent expert?

A. I don't think so, no.

Q. Thank you. Have you ever consulted or advised on the installation of a solar facility?

A. No. No, I don't think so.

Q. Any size whatsoever?

A. Not that I can think of, no.

Q. Have you ever designed or built a solar product, EBOS or otherwise?

A. No.

Q. Is it true that you -- let me restate the question.

You've never, in fact, worked with solar cells or solar panels in a professional capacity; is that right?

A. My profession includes my role as a teacher, and an advisor of thousands and thousands of students. They have had projects over the years where solar cells were used for gathering solar power --

Q. You've had some students --

A. I would admit mostly on low-power applications for consumer electronics.

Q. Didn't you testify at your deposition that -- or you had talked about your experience with solar cells was mostly related to personal experience, such as camping trips, charging up your phone, that sort of thing.

Is that true?

A. My hands-on experience, yes, right.

Q. Have you had any formal education on the use of solar panels or the installation of solar panels or the design of a solar installation?

A. Are you referring to the kinds of professional certification, education that one might have?

Q. Just anything. Any postgraduate classes, any undergraduate classes.

A. I've had plenty of education in the underlying physics that makes up -- the overwhelming majority of what goes on --

Q. Behind the glass?

A. -- but no classes that were specific to any content that is related to installing or building solar installations.

Q. Thank you.

Prior to your involvement with this case, because I know we heard about it this morning, did you have any familiarity or working knowledge of the National Electrical Code as it pertains to solar?

A. Almost certainly not.

Q. Do you hold any accreditations of any type that relate to the solar industry?

A. Nowhere on my resume.

Q. You have represented that, in your view anyway, that technological field of the '153 patent is in the field of solar energy installation, solar power system, and methods of constructing a solar power installation; is that correct?

A. That's somewhere in my report.

Q. Should we bring it up?

A. Yeah. Sure.

Q. Let's go to your deposition, page 141, beginning at lines 15 through 22.

I asked you: Can you tell me what the technological field is relevant to the '254 and '153 patents?

And you made reference to your report. And you said that the patent describes methods and apparatus for a lead assembly for use in a solar energy insulation -- I think that's installation -- solar power systems and a method of constructing a solar power installation.

So do you still believe that to be the case?

A. I'm reading, actually, from the '254 patent.

Q. In response to my question, can you tell me what technological field is relevant to the patent?

A. Yeah, so I would agree, the '254 patent describes methods and apparatus for --

Q. Okay. That's fine. And you've been, obviously,

hired to act as an expert in this case, correct?

A. Yes.

Q. And you understand that as an expert it's part of your job to help the judge as the factfinder to understand the evidence in this case?

A. Yes.

Q. And are you aware that the judge in this case has proposed a definition of what the qualifications of a person of ordinary skill in the art are?

A. I believe that was on one of my slides.

Q. Let's look at it real quick.

Can you put the Markman Order up, page 12?

Can you read the underlying red section there?

A. "Working with photovoltaic systems."

Q. And do you disagree with the judge's conclusion as to the definition of an ordinary -- of a person of ordinary skill in the art?

A. So the statement --

Q. Yes or no, do you agree with it or do you not disagree with it?

A. The judge's entire statement, yes.

Q. Okay. Thank you. And you've admitted to having no experience with photovoltaic systems, correct?

A. That's correct.

Q. And you've also had no formal education in

photovoltaic systems, correct?

A. So I would disagree that the education I've had excludes anything related to photovoltaic systems.

Q. So back to what you told the judge, it's the front of the glass, the semiconductors? Okay.

A. Underlying physics of photovoltaic systems, I'm well prepared for, and I understand how it applies in this case.

Q. Let's look real quick at your presentation, slide 63.

I just want to make sure that I understand what you're representing here.

So the claim requires a first aperture extending completely through the undermold and having a first diameter, wherein the feeder cable extends through the first aperture along a first longitudinal axis.

I see where you have highlighted Yamawaki with a yellow dotted line there.

Is that -- is it your position that that cable right there is a cable that extends all the way through the aperture through that mold?

A. So the description in Yamawaki of the item 31A, the branch cable, during the section that describes the assembly of this structure, describes it as a single entity.

Q. So it's your -- just so I understand, it's your

position that the cable on the left of the yellow dotted line is the same cable as on the right of the dotted line, that's your position?

A. Through -- yes.

Q. Single cable. Okay. Thank you.

A. Same cable.

Q. Thank you.

MR. MASCHOFF: I think that's all I have Your Honor. Thank you.

EXAMINATION BY COUNSEL FOR ITC STAFF

BY MR. SHIN:

Q. Good afternoon, Dr. Kenny.

A. Good afternoon. Good to see you.

Q. I'd like to put up your slide RDX-3C at page 13.

Continuing with what counsel was asking you about your experience, page 13, please.

So earlier you testified on direct about this slide just in general, overview of a solar energy system; is that right?

A. That's correct.

Q. It was very helpful for me. But you're testifying today, its not like you learned this overnight, is it?

A. No. This is -- the general architecture of situations like this where you have a DC power source and

connections to an inverter, well-known in my background. The particulars of solar installations, based on my knowledge of what a solar cell is and how it produces energy, is well-known in my background, and reading the specification and claims of the patent, I understood everything that was described there.

Q. You may have not specifically worked on a solar energy installation, but you indicated that you have worked on semiconductors that are used in the solar industry; is that right?

A. I studied and taught about semiconductors, such as the -- semiconductor and some of the more modern technologies used in the solar energy industry.

Q. So you do have experience in the solar industry from that point of view?

A. I believe so.

Q. And how many -- how -- could you quantify that, how many years, for example?

A. So my Ph.D. is from 1989. Probably one of the oldest people in the room, sorry to say, but, yeah, it's 40 years since that education, and my experience since then has aggregated to that.

Q. Let's turn to your page 19.

Continuing on this topic, the judge issued a Markman Order, and what's in red, at least two years

experience working with photovoltaic systems and electrical wiring.

I believe you said in the aggregate you don't have those two years of experience, specifically when you deal with PV systems and electrical wiring; is that right?

A. Yes. I have many years of work -- of experience with electrical wiring.

Q. So can you quantify that, please?

A. Yeah. So electrical wiring has been -- was used in my Ph.D. thesis, starting more than 40 years ago, and throughout my entire career as an experimental mechanical engineer and researcher.

Q. In particular, I know that you mentioned earlier a textbook that you wrote or that you used, mechatronics; is that correct?

A. There's a textbook called Introduction to Mechatronics Design from, I think, 12 years ago that I coauthored.

Q. That you coauthored and that continue to apply in your teachings?

A. That's right.

Q. You described that that was more like a robot system.

But is there any connection in your mind with that textbook and your teachings to the principles that

we're covering today?

A. Certainly to the basic principles of connectors and protecting connectors from exposure to the outside, yes.

Q. And then the highlighted part, with recognition that more education could substitute for experience.

Could you elaborate a little bit on how you might satisfy that?

A. Certainly. And that's -- an element like that is present in all four proposed definitions of the experience of a person of ordinary skill. I have substantial education and experience as a teacher, which contributes to that further education in related areas that I think contributes to my preparation for our proceedings today. I believe I'm very well qualified to offer the opinions I've offered, and prepared to answer any questions that I've been asked related technologies.

Q. Now let's move on.

A. One more comment.

Q. Please.

A. I talk about lots of things in my life. It's an unusual circumstance where I'm defending my qualifications on topics such as electrical connections and wiring and molding. So if I've seemed a bit impatient or grumpy, that's -- my apologies. I'm just not normally in the position of having to defend that part of my background.

Q. Let's move to your 112 considerations.

You have an opinion that aperture is indefinite under Section 112; is that right?

A. Mm-hmm.

Q. And you had a lot of slides that you walked through with your counsel about no reasonable certainty.

Let's pull up slide 51, please, your summary slide.

Here you summarize the four tests that you considered; is that right?

A. Yes, that's correct.

Q. I would like to go to the patent, the '153 patent, and go to figure -- let's go to the Figs. 35 through 38, please.

Now you've reviewed the '153 patent of course, right?

A. (Nodding head up and down.)

Q. So there are figures that show different levels of sequential manufacture or assembly of the lead assembly, right?

A. That's correct.

Q. Here we see some of that. So, for example, in Fig. 37 you see that the feeder cable surrounded by insulation on both ends, and then you have a drop line 12 that extends all the way from left to right, and you also

have an exposed area in the middle where the insulation is stripped; is that correct?

A. Correct.

Q. Let's move up to Fig. 35 now.

You have Fig. 36, which adds a compression lug to Fig. 37, and the undermold is not on here yet, but you can sort of imagine the undermold being applied next, right?

A. That's correct.

Q. Okay. So is it your understanding that the Cable Test, would look at a drop line, which identified here as element 12, and it would include the entirety of that cable.

A. Yes, that's my understanding and how I applied that test.

Q. The entirety of the drop line within the undermold.

A. That's correct.

Q. Can we highlight sort of the section or just the entirety, something that covers the entire length that goes all the way, something like that. That's fine.

Is that sort of the Cable Test, if you remove the cable within the undermold, then it's going to go completely through, right?

A. That's correct.

Q. Can we bring that highlighting down all the way down to the bottom, a little bit more.

Now earlier -- and you've been here throughout the week; is that right?

A. I have.

Q. You've heard Mr. Brooks testify?

A. Mm-hmm.

Q. And so he --

A. Yes.

Q. -- he testified that he is applying the ALJ's claim construction for aperture in relation to the drop line, and he is looking at the drop line as either starting at the edge of the nexus and going out or coming in from the undermold and stopping at the nexus.

Is that fair to say?

A. That's correct. In his definition, it stops at the nexus.

Q. Can you draw a highlighting sort of that particular section?

Let's use a different color. Just going from there and stopping -- go a little bit more to the right, about right there. Okay.

And what's highlighted in blue, is that similar to what Mr. Brooks testified about?

A. That's my understanding of his definition.

Q. So that would be his aperture. That would be --

A. Which I called the end at the nexus test.

Q. And so if the Cable Test is the first aperture, possible aperture, right, then let's say that Mr. Brooks' aperture in blue is the second possible aperture.

Can we bring that down on top of the yellow?

And now we also heard testimony, or you can imagine, that the aperture -- well, at least a drop line extends further under the compression lug, right? We don't know exactly where it might stop based on like the electrical current going through, but you recall Dr. Cameron testifying, or at least from her deposition, that it might end in the middle.

A. Somewhere near the middle I think, yes.

Q. Dave, can we draw another color and highlight to the middle?

And this could be a possible third aperture?

A. Yes. This would, I guess, be following the line until the current has moved away somehow or...

Q. Okay.

A. Just drawing an arbitrary line somewhere.

Q. And, Dave, can we move that sort of purple highlighting down as well?

And then we also saw in the intrinsic evidence, in the patent specification and the claims, we saw dependent claim 2 that says that the exposed wire is part of the drop line.

A. Yes.
Q. Do you recall that?
A. (Nodding head up and down.)
Q. Okay. Dave, can we use another color and highlight a length that goes to the other side of the compression lug? About right there. So that's a darker yellow.

So does that correspond with the drop line as it goes into the undermold, under the compression lug, and all the way to the other side of the compression lug?

A. So we're thinking of Fig. 7 in this case, for example?
Q. It could be Fig. 7, for example, but it could also be for the two -- for this, where there's two drops, but the exposed wire is sort of shared by both drops.
A. Yes. Okay.
Q. But, in any case, claim 2 says that the drop line has an exposed wire, and we understand that that helps to make the electrical connection with the feeder cable.
A. That's correct.
Q. So this would be a fourth option for aperture.
A. For example, that might be what's in the Shao reference.
Q. So let's bring that down.

So for the drop line, and let's say this is the

first drop line, under the Cable Test, there's certainty, right? And if that is what the ALJ, if she was using the Cable Test in her construction, then there's certainty that the aperture is not indefinite.

A. That would line up with the purple box here?

Q. No. That would line up with the bottom box, the highlighting, the entire length of the wire.

A. I understand. Yes. Yes.

Q. The Cable Test.

A. Yes.

Q. But if Mr. Brooks, if there's any -- if you believe that the aperture is only the part of the pathway of the drop line that ends at the beginning of the nexus, then you have that option, the second option, and then you have another option because the drop line might extend to the middle of the compression lug, right?

A. Correct.

Q. And you may have another option where the drop line and the aperture extend all the way to the other side of the nexus?

A. That's correct.

Q. In those cases you have at least those three options, and in that situation there might be more reasonable uncertainty?

A. Yes.

Q. And that's just for the first drop line. If you consider that there is a second drop line here, and you try to figure out if there's a separate aperture, or even if it's overlapped, it multiplies, right?

A. Right. You would have a set of boxes just mirrored across the center of this, but it would look just like this.

Q. So that would further add to the reasonable uncertainty to one of ordinary skill in the art, would you agree with that?

A. I agree with that.

Q. For your prior art, is it -- can you just give an overview? You were presenting one prior art combination, correct?

A. That's correct.

Q. But earlier in Voltage's pre-hearing brief they are putting forth another prior art as the 2012 wire, Shoals wire harness, right?

A. That is correct.

Q. And is it your understanding that that has since been dropped?

A. I understand that's been dropped.

Q. And there are certain claims that you didn't put forward.

Or is it your understanding that any claims have

been sort of dropped by Shoals?

A. I can't say for sure which claims have been dropped by Shoals and which perhaps have been dropped from consideration by Voltage, but I know we're looking at a subset of the claims.

Q. So, for example, there is a dependent claim 8 that talked about longitudinal axis being parallel.

A. (Nodding head up and down.)

Q. And I don't recall you putting that up earlier.

Is that because it's your understanding that certain claims did go away?

A. Actually, I can't say for sure how that disappeared.

Q. I understand. Let's talk about your prior art combination between Yamawaki and Shao.

So, first of all, let's go to page 64 first.

And I just want to focus on the right-hand side. This is Yamawaki.

And it is Yamawaki's mold drop, right?

A. Yes.

Q. And you have annotated this to where you have indicated where the feeder cable would go through the mold drop, right?

A. That's correct.

Q. But I didn't hear you earlier say that that was

explicit or inherent.

Is this explicit or inherent in Yamawaki?

A. I believe it's explicit, as I interpret the written description in Yamawaki --

Q. Okay.

A. -- describing the item 31 as a single item, in the singular, at the beginning of and completely through the assembly process.

Q. And you believe it is explicit that Yamawaki describes the second aperture only going partially through?

A. Yes, I think so.

Q. All right. Not inherent as what appears to be from your annotations in the figure?

A. The language in the figures make it very clear that it --

(Clarification requested by the court reporter.)

A. -- the language in the claims make it -- sorry -- the language in the figures make it clear that it is extends only partway through. I hope that's what I said. I think it's what I said. That's what I meant to say.

Q. Now based on your -- the tests that you showed earlier and the Court's claim construction for aperture, what test or construction are you applying in your analysis of the prior art?

A. So this structure would -- an aperture extending

partway through under all of the proposed tests, as I understand them, the See Through Test, the Cable Test, the End of the Nexus Test, and the Disappearing Wire Test.

Q. So you believe you're presenting sort of alternative opinions across all of those tests?

A. Correct.

Q. Okay. Now Yamawaki, does Yamawaki disclose a second drop line?

A. It does, as a second structure down the line here, yes.

Q. So it describes a one-drop mold drop and then a second mold drop with another drop.

A. That's correct.

Q. But in one mold drop, does it describe two drop lines?

A. Nowhere does it describe two drop lines in one mold drop.

Q. Does it disclose any written description of a second drop line within the same mold drop?

A. Not that I can recall.

Q. It doesn't disclose any motivation to increase the number of drop lines in one mold drop.

A. No -- I would say it doesn't disclose any specific motivation in that direction. The overall interest in motivations of Yamawaki and Shao lead me to believe that

it's reasonable to consider those together, and it's Shao that brings that second drop line.

Q. Okay. But Yamawaki doesn't?

A. That's correct.

Q. And Yamawaki is your primary reference?

A. That's correct.

Q. Yamawaki is complete as it is and it does a fine job?

A. That's right.

Q. Okay. And does Yamawaki disclose a dual mold, double mold, undermold and overmold?

A. It does. I think Fig. 9B shows the outer structure 33F.

Q. Can we go to the next slide 65, please?

A. Undermold 33E, and the overmold 33F. Those are both molded structures.

Q. I see. So the figure -- is that sort of a little misleading, that sort of cutout is just to show that there's an undermold?

A. It's just to make it clear what's inside, yes. I don't believe that's structurally intended.

Q. All right. Let's go to your next slide, 66.

Now we see Shao. And I just mentioned earlier, there may not be proper motivation to combine Yamawaki with Shao if Yamawaki doesn't need to have another drop line,

right?

A. So Yamawaki is, in general, describing the benefits of simplifying the cable structures, and I think one of ordinary skill would notice that it might be possible to have multiple drops from a single drop, and that Shao brings some ideas about how to accomplish that.

Q. Here in Shao, does the wire for the drop line, does it go all the way through?

A. So Shao describes two separate wires, actually the first part of that excerpt, a trunk conductor and branch-line conductors are formed by stranding the wires together, and then what happens is the two branch-line conductors are symmetrically overlapped and crimped against the trunk conductor in the highlighted section. So there's three items, two branch wires and a trunk wire, at the start of the assembly.

Q. I see. Okay.

A. And maybe just to anticipate the question, I think that's why the construction of Shao meets all of the -- all of the constructions of the aperture limitation, because it's two wires overlapped and crimped.

Q. Okay. Thank you. That's all the questions I have.

A. Thank you very much.

REDIRECT EXAMINATION

BY MR. YEN:

Q. Dr. Kenny, you were asked about your expertise in solar technology and in comparison with your expertise in physics.

Do you recall that?

A. Yes.

Q. Okay. Is solar technology outside the realm of physics?

A. No. It's squarely within the realm of physics, energy from photons coming into semiconductor devices, affecting the transport of electrons, squarely in solid state physics.

Q. And when there was some distinction made between solar technology or photovoltaics versus the EBOS portion of a system, I think the implication was that you had first focused on the photovoltaic side of the technology.

Do you recall that?

A. (Nodding head up and down.)

Q. And why is that?

A. Well, so the patent includes the use of solar and photovoltaic cells to generate the energy that is the input to the EBOS system in these patents.

Q. And I think you said that the -- is the reason that you focused on the photovoltaic side of the technology

as opposed to the EBOS system in response to that question because the EBOS system operates more or less independently of anything related to photovoltaics?

A. So the way the system, the structures operate, is not specifically related to solar. The way those structures are classified and identified and certified relates to their use in solar. And I understand the importance of people building solar installations selecting the right components. I'm squarely okay with that.

What actually goes on in those wires and cables and connectors and junctions is basic electronics, electron transport through metal wires.

Q. So you would say that the EBOS system, if it's about wiring, it could be applied to nonsolar applications?

A. Yes.

Q. You were also asked about whether you had considered all the different tests when you were looking at prior art.

Do you recall that?

A. That's correct, yes.

Q. When you were preparing your report, was that before or after the Claim Construction Order, which I think issued sometime in February?

A. So the report was prepared before the Claim Construction Order, well before, but it was after the

Markman hearing, where many concepts were discussed and debated.

Q. As part of your materials considered, had you considered the briefing and the Markman hearing for claim construction as part of your report?

A. Yes. And if I -- I'll let you ask the next question. Sorry.

Q. Sure. So in applying -- in preparing your report, did you apply the different proposed constructions that the parties had proposed in their briefing?

A. Yes.

Q. And did you apply the different proposed constructions that were discussed at the Markman hearing?

A. Yes.

Q. Is the fact that you applied those tests consistent with how you prepared your report? Sorry. Is that consistent with your opinion on indefiniteness?

A. Maybe ask that again?

Q. Sure. In preparing your report, do you recall any -- any opinions that you offered only with respect to certain constructions or proposals?

A. No. No.

Q. Mr. Brooks, could you bring up RDX-003, Dr. Kenny's presentation, slide 22?

I think earlier you said that you had considered,

you know, where in the spec aperture appeared; is that right?

A. That's correct.

Q. And so when you mentioned that you had visited Voltage in China, and you were looking at things, and one of your first thoughts was in the optics field.

A. Yes.

Q. Had you read the patent at that time, do you recall?

A. I read the patent?

Q. The '254 patent at the time.

A. The '254 patent, yes.

Q. That's the same specification as the '153 patent, right?

A. That's correct.

Q. And so you would have come across this understanding of aperture, do you believe?

A. So, I mean, this term, the word aperture is used in this part of the patent. It's the only real support for that term in the patent that I could find.

Q. And would this understanding of aperture have been consistent with that in optics?

A. Well, I mean, you can see through it, I guess, if you like. I think here it's more relevant, you can put a zip-tie through it, but it's an opening that that can go

through.

Q. Earlier Mr. Maschoff asked you about whether you had considered the NEC, the National Electric Code, right?

A. He asked me that question.

Q. Did you see NEC anywhere in the patent?

A. No. The National Electric Code and, as far as I can tell, none of its chapters or certifications are mentioned in the patent.

Q. And do you know if that's something that is federally mandated or is it mandated by state?

A. I understand it's complicated. I don't know for sure where it applies and how it applies state by state.

Q. Okay. But do you know if it would apply outside the country, outside the United States?

A. The National Electric Code? Probably does not apply outside of the U.S.

Q. And yet this patent and this technology, you would say, isn't limited just to U.S. borders in terms of the technology, right?

A. Correct. It's not limited just to the U.S.

Q. Okay. You were here this morning and you heard from Professor Cameron or, sorry, Dr. Cameron; is that right?

A. Uh-huh.

Q. Did you hear that she had a different test that

she was presenting?

A. (Nodding head up and down.)

Q. Sorry. Would you consider that a different test, her definition of aperture?

A. So I understood that under questioning she was asked to draw the boundary between a first drop line and a second drop line in these structures, and she drew it somewhere near the middle.

Q. In her describing that test, was there -- did you find any particular issue or a reason to choose that test or not choose that test?

A. Nothing in particular. It would then be the fifth test on the list of tests that we were considering.

Q. Could you bring up slide 63?

On this slide, just a slight correction. I think during your testimony earlier you had referred to Yamawaki 31A as a branch cable.

Is 31A a branch cable?

A. It's a trunk cable, as described in that patent. Sorry.

MR. YEN: Okay. Thank you very much.

MR. MASCHOFF: Just a few more questions, Your Honor.

JUDGE BHATTACHARYYA: Yes.

RECROSS-EXAMINATION

BY MR. MASCHOFF:

Q. Dr. Kenny, you were shown Fig. 35 from the patent by counsel.

Can we bring that up?

I think that was referred to as a one-drop line assembly.

Is that your understanding of what this drawing shows?

A. I think it's described as a double-drop assembly.

Q. Double-drop. Okay.

So this particular embodiment, you'll agree, is a two-drop line assembly; is that correct?

A. So it's described as a two-drop assembly.

Q. Two-drop assembly, okay.

A. The text that goes with that description describes the wire as a drop line.

Q. Okay. So single wire, is that representative of single wire, yes?

A. This is a single wire all the way through, yes.

Q. So single wire, two-drop line?

A. That's two drops, yes.

Q. Two drops. Okay. And remind me. The claims require drop lines?

A. Drop lines are --

Q. Okay.

(Clarification requested by the court reporter.)

A. Drop lines are required in the claims.

MR. MASCHOFF: That's all I have. Thank you.

MR. SHIN: Nothing further from the Staff, Your Honor.

JUDGE BHATTACHARYYA: Thank you, Dr. Kenny. You may step down.

THE WITNESS: Thank you very much. I appreciate your patience with all of my physics explanations.

JUDGE BHATTACHARYYA: Let's take a break for 15 minutes.

(The hearing recessed at 3:30 p.m.)

(In session at 3:45 p.m.)

JUDGE BHATTACHARYYA: Please be seated.

MR. BARQUIST: Your Honor, at this point Shoals would like to begin its rebuttal case and call Joshua Weiner.

JUDGE BHATTACHARYYA: All right. I assume we're not hearing the deposition designations; is that correct?

MR. BARQUIST: Apparently not, Your Honor.

MR. OU: Yes, Your Honor. If we may, we'll submit the deposition designations with the other ones. Thank you, Your Honor.

JOSHUA WEINER,

having been first duly sworn or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. MASCHOFF:

Q. Would you introduce yourself to the Court, please.

A. My name is Joshua Weiner.

Q. Mr. Weiner, could I refer you to the slide on the screen?

Can you tell me what that is, please?

A. This is my CV.

Q. Okay. And does it accurately reflect your education and work experience?

A. It does.

Q. Can we talk about that for a second? Can you please tell me about your education?

A. Sure. I got a bachelor's degree in astrophysics astronomy and a minor in physics from the University of California at Berkeley in 2005.

Q. Are you currently employed?

A. I am.

Q. Where at?

A. SepiSolar.

Q. What does SepiSolar do?

A. SepiSolar provides solar designs, solar

engineering services to solar builders, like EPCs, engineering, procurement and construction companies, solar developers, so asset owners.

Q. What is your position at SepiSolar?

A. Founder, President, and CEO.

Q. And your responsibilities are?

A. I get more involved in the rather complex solar design issues: new solar products, new integrations of solar systems with other assets, and then I am responsible for the hiring and training of new engineers to get up to snuff on the solar subject matter.

Q. And you have had, it looks like, a number of other positions listed on the screen. Could you walk us through what those are?

A. Sure. Akeena Solar was my first solar job. Basically, I did thousands of solar designs and solar engineering work with Akeena, one of the premier contractors of its time in the early solar days.

I also led a team of 10 to 15 engineers and was responsible for all of their work overseeing complex and more difficult solar design and solar engineering challenges that we would run into in the field and such.

After that, Engie Storage, which I cofounded right around the same time I started SepiSolar, and we worked on integrating solar systems with batteries.

UC Berkeley Extension shortly after that approached me to teach some courses, because there was some solar education lacking in the world. And so I developed by own syllabus and curriculum and lesson plans for what became known as the Advanced Solar PV System Design and Project Management course, and PV is photovoltaics, the acronym. Keep an eye on that.

And then after that, NRG Energy. I helped them. They are a power plant company, and I helped them deploy tens of thousands of residential and small to mid-size commercial systems all throughout the country. And that brings us to present day where I'm still at SepiSolar.

Q. Do you have any certifications in the solar field?

A. I do. I'm NABCEP certified, which is North American Board of Certified Energy Practitioners. It's the only solar-specific certification I'm aware of. I got mine, my certification, in 2007, and I've kept it up-to-date through to present day. Every three years I have to provide a bunch of hours, continuing education credits, test, proof-of-work product, deliverables, and yeah.

Q. And to become accredited, what must you do?

A. Oh, you do have to take an eight-hour test. It's open book, but it makes it a little harder. And when I took it, in 2007, it had a 40 percent passing rate, yeah. So I

was -- that was a little bit of a proud moment.

Q. What are you showing on this slide?

A. These are projects I've personally worked on, what I call the verticals of the solar industry.

Q. Can you explain what those verticals are?

A. Sure. Well, so residential systems, I've designed thousands of those. Those are like small systems that go on rooftops. You might see them driving down a cul-de-sac and you see your neighbor with solar panels on the rooftop and you can see it on the street.

Commercial systems are bigger. They are, like, 100 kilowatts to a megawatt or two apiece. You might see those flying into Reagan and you look at downtown and you see blue rectangles reflecting back at you, or big department stores, like Home Depot, Costco, Target, Walmart, they will have big flat roofs covered with solar panels, that would be commercial.

Utility-scale is a totally different animal because you're in the middle of nowhere and you're driving down the highway and you look over and you just see fields of solar panels, millions going off -- just like the image on the screen. It's a completely different scale. They're huge.

Q. And you have some acronyms up there designating the two categories. Can you explain what that means?

A. Sure. So BTM/FTM is behind -- this is industry talk for behind the meter and front of the meter. Meter being that device on the side of your house that your electric utility company uses to bill you for electricity.

What residential and commercial systems have in common is they feed electricity into structures and buildings. The front of the meter does not. The front of the meter, you're designing a utility farm for export into a utility grid for resell, redistribution, and for the public.

So there's consumer protection rules, there's much more regulation, more red tape, more permitting hoops that you've got to jump through, more inspections. It's a completely different time scale. It's a completely different level of complexity. You need very different skill sets than you do with behind-the-meter systems than in front of the meter. I find behind the meter and in front of the meter a helpful distinction to show the differences.

Q. As part of your job responsibilities or work in these projects, do you have any familiarity with the National Electric Code or the NEC?

A. Yes. It's like the Bible. Every solar designer and solar engineer I've ever worked with knows it well.

Q. So it is an important document to have awareness of?

A. If you're designing and engineering solar

systems, absolutely, unequivocally, yes.

Q. Are you familiar with the term EBOS? We've been using that quite a bit this week.

A. Electrical balance of system components, yes.

Q. And do you have experience designing in the EBOS area?

A. Yes. That's a significant amount of the work this goes into solar designs in general.

Q. And what part of the solar design does that EBOS refer to typically?

A. From the back of the glass of the solar panels all the way to the point of connection with the utility grid, not including the inverter.

Q. As a summary, how many years of experience do you have in the solar industry?

A. Nineteen, 19 or 20.

Q. And, of that, how much utility experience?

A. Half of my experience is in utility-scale.

MR. MASCHOFF: Your Honor, we would like to submit Mr. Weiner as an expert in photovoltaic solar energy systems, EBOS, and the electrical wiring for solar systems.

JUDGE BHATTACHARYYA: Any objection?

MR. OU: No objection, Your Honor.

MR. SHIN: No objection from the Staff, Your Honor.

JUDGE BHATTACHARYYA: At this time Mr. Weiner is admitted as an expert in photovoltaic solar energy systems, EBOS, and the electrical wiring for solar systems.

Q. Mr. Weiner, are you aware that the judge in this case has adopted a definition of a person having ordinary skill in the art?

A. I am aware.

Q. And do you see that on the screen?

A. I do.

Q. And do you have at least the level of ordinary skill in the art as defined by the judge in this case?

A. I do.

Q. And in connection with the analysis that you've performed, were you able to do so from the perspective of one having this level of skill in the art?

A. Yes.

Q. Mr. Weiner, have you read the '153 patent?

A. At least a few times, yes.

Q. And what other materials have you considered in connection with your work on this case?

A. The prosecution history, I'm here as a rebuttal witness, so Dr. Kenny's report, and all the prior art references that he cited, the Markman Order.

Q. Thank you. And have you also prepared an expert report addressing Dr. Kenny's allegations of invalidity?

A. I have.

Q. Okay. And out of curiosity, having read the '153 patent and become familiar with it, which of the categories that you described for us does the patent fall within?

A. Definitely utility-scale.

Q. Thank you. Mr. Weiner, I know we've seen this slide a lot this week, but I'm wondering if you could tell us what it shows?

A. Sure. So the blue rectangles and identified as item 30, those blue rectangles are what's called solar modules. The red box around those four blue solar modules is a solar panel. And within that yellow box there would be four solar panels making up that yellow box, which we call a solar array.

So 32A is a solar array. Within the solar array, there's four solar panels. Within each solar panel, there's four solar modules in this figure.

Q. Thank you. And is that description and use of terminology a consistent or common way of describing these sorts of things in the industry?

A. Yes. I'll admit that, as a professional, and lay people, when we're talking about these systems, we do mince the words a bit like solar panel, solar module. I mix those up. Others mix those up. We usually forgive each other for that. It's not too big of a deal.

But in the context of the National Electrical Code, these terms are specifically strictly defined, and the '153 patent is actually consistent with it as well.

Q. Okay. And in the context of the '153 patent, can you explain what a wire harness is?

A. Yes. A wire harness groups the outputs of solar panels.

Q. And are wire harnesses illustrated in Fig. 2?

A. Yes.

Q. And are those the items -- can you tell us which of those components are a wire harness?

A. Sure. So there's three wire harnesses showing on the screen in Fig. 2. They are in three different colors: red, blue, and another shade of blue.

So what's going on here are, if you look at the red wire harness, toward the top, there are four branches, one branch per panel. So each one of those branches collects the output of one solar panel. Four branches total four solar panels.

Those branches run and are grouped into that thicker, that darker red color, which is the trunk cable, and the branches connect to the trunks by way of these junctions, which are shown as green.

And then the trunk carries the power over to the combiner box shown as item 36.

Q. And what happens at the combiner box?
A. Like the name suggests, the combiner box is a box that combines the outputs of these wire harnesses.
Q. And where does the combiner box send its output?
A. The combiner box then sends power to the inverter shown as 38 by way of this thicker black line labeled as "DC Feeders."
Q. And can you explain why the Fig. 2 of the patent is labeled as prior art?
A. Because this is how designers and engineers like myself and my staff, this is how we design utility-scale solar farms all the time without -- before the invention of the '153 patent. This is very generic.
Q. Okay. So you've design solar systems of this sort?
A. Oh, lots, many, and my staff.
Q. Mr. Weiner, did you formulate an understanding of the meanings of the terms used in the patent claims of the '153 patent?
A. I have.
Q. You're aware that the judge has adopted some definitions for certain of those terms?
A. Yes.
Q. And are you familiar with those definitions?
A. I am.

Q. Have you, in connection with your analysis, have you adopted those definitions as part of your analysis?

A. Yes.

Q. Have any of your opinions changed since the -- since the adoption of these definitions?

A. No.

Q. What is shown on this slide, Mr. Weiner?

A. This is claim 1 of the '153 patent.

Q. I'm wondering if you could just at a high level walk us through the claim.

A. Yeah. Sure. So, first, I think of the inventive concept of the '153 patent as consolidation of power from a wire harness at a nexus sealed by a mold.

So I'll read the claim and show how this inventive concept kind of pops out.

So, first of all, at the top, a lead assembly is configured to consolidate power from a wire harness, where that consolidation is done at a nexus, which combines the feeder and feeder cable and drop lines, where that nexus is sealed or encased by an undermold, and that undermold includes three apertures that are defined as -- by a pathway of these feeders and drop lines through the mold, and then the overmold -- in this claim the mold is divided into two parts, an undermold and an overmold, so the overmold surrounds the undermold.

Q. What are we showing in this slide?
A. This is a summary of my opinions regarding Dr. Kenny's proposal of the Yamawaki-Shao combination of references.
Q. What is your understanding of Dr. Kenny's invalidity position with respect to, I'll read the claims off, 1, 12 through 14, 21, 23, and 24?
A. Yeah. Dr. Kenny proposes combining -- modifying Yamawaki based on the teachings of Shao to render those claims you just read as obvious.
Q. And is he -- what is he proposing to do to Yamawaki?
A. It's not really clear to me how Dr. Kenny proposes combining the two. But, I mean, basically, generally, he says you combine the two, you render these claims obvious somehow, and, you know, I do ultimately disagree with that.
Q. Can you explain the modifications that he is proposing that must be made to Yamawaki in order to make it meet the claim language?
A. Well, basically, he has to bring in Shao to bring in apertures of different diameters, a second drop line and a third aperture.
Q. Thank you. And do you agree with his conclusion?
A. No, for at least a few reasons. I mean, for

starters, I don't consider Shao analogous art. I would never look to Shao if I were inventing or working on a DC outdoor system that combines outputs of power. It just wouldn't occur to me at all to look -- I'll get into some more detail on that later.

And then Yamawaki only discloses a wire harness. So anything I do with Shao, I'm still working in the context of a wire harness, not a lead assembly.

And then, even if I did look to Shao to modify Yamawaki somehow, I wouldn't be motivated to combine the two for several reasons I'll go into a little later. Ultimately, in short, it will break what Yamawaki is trying to teach.

And then, finally, even if I did look to Shao and I was motivated to combine the two, there's still elements of the claims that are left undisclosed.

Q. So you've previously drawn a distinction between residential and utility-scale solar.

Can you tell us which of those verticals Yamawaki fits in in your opinion?

A. Definitely residential.

Q. And why is that?

A. Lots of reasons. First of all, I mean, when I'm reading, as a person of ordinary skill in the art, when I'm reading the Yamawaki patent, it screams residential solar

all over it. It mentions house and building and how to get wires into the house more efficiently and on rooftop installations. I actually find it a really clever invention for residential rooftops. It addresses a real problem.

Q. What are you showing in this slide?

A. The problem. So residential rooftops -- I've designed thousands of these. I'm tell you two things. No two roofs are the same. They are all different. And, secondly, they are messy. And these images, I hope, illustrate that.

There's dormers and skylights and vents and satellite dishes, chimneys and trees, and all sorts of things that get in the way of a solar panel from doing its job. So you've got to mix and match all over rooftops to maximize production so you get the maximum return on investment, because that's why people buy residential solar, you know. It's for an economic purpose usually.

And so, yeah, so Yamawaki presents a very streamlined solution for the market that allows -- it's a wire harness, so it collects the power output from these solar panels, but it does it in a really clever adjustable way so that it could literally work on any rooftop. And that's what you need. You need a standardized product or service that can somehow morph or adapt to any kind of rooftop. And that's a tricky challenge. When I was reading

Yamawaki, I was like, wow, I wish I had known about this 20 years ago.

Q. To deal with the problems that you've just described with residential solar, what's the -- can you explain sort of the nature of the concept of the solution that Yamawaki is implementing?

A. Sure. So Yamawaki proposes its wire harness, like all wire harnesses, has branches and -- branches and trunks. Yamawaki proposes being able to elongate or shorten the trunk cables of any length as well as the branch cables. So that, basically, what Yamawaki calls the branch junction could be located anywhere along that trunk line.

So, in other words, you're bringing the branch junction to the solar panels, not the solar panels to the branch junction. And you have this inherently really flexible, adjustable standard product that you assemble in the field for each roof, for each unique specific house you're working on, because they are all different.

Q. When you say "adjustable," you can adjust the branches or the trunks, what do you mean by that?

A. By lengthening or shortening the branch cables or the trunk cables.

Q. Can you explain what this figure shows?

A. This is Fig. 3 of the Yamawaki patent showing a generic rooftop with solar panels overlaid on top of it,

eight of them in this image, eight solar panels, and then Yamawaki's invention, the wiring harness overlaid on top of it.

Q. And does Yamawaki use the term "wire harness"?

A. No. Yamawaki calls it a "wiring apparatus," but when I read its function and construction and how it's used and all its descriptions, it discloses the first element of the '153 patent.

Q. Can you explain with reference to this drawing how you see wire harness in this figure?

A. Sure. So you see in this image there are four solar panels. And if you look at each solar panel, the output of it connects to a pink line. That's the branch of the wiring harness.

So those pink branches collect the output of each solar panel, one branch, one solar panel, and it groups that into the dark -- the thicker darker red trunk line by way of these junctions or joints or branch junctions, what Yamawaki calls them, the green squares, and then the red trunk cable routes back to the inverter or to the combiner box.

Q. And you say that there's four solar panels. Did I hear that correctly?

A. That are connected to this wire harness, yes.

Q. And is your view of these panels, which look to be made up of multiple portions, is that consistent with

your definition of solar panel that you've described for us before?

A. Yeah. I guess, if you just look at one of the solar panels, you'll see six solar modules, two rows of three, inside each one.

Q. And does a solar panel have a single output?

A. Yes.

Q. How does the solar or the wire harness of Yamawaki or the wiring apparatus, how does it compare to the wiring harness that you described for us in connection with Fig. 2?

A. They look a little different, but they are functionally equivalent.

So the difference, if I may, is in a utility-scale solar system, the solar arrays are very uniform and standard. They do not need adjustability at all.

You go into a manufacturing process, you print or manufacture or fabricate a whole bunch of these wire harnesses, they look exactly the same. You ship it on site. You install on site. It's like a massive manufacturing process.

With Yamawaki, it's got all the same components, it serves the exact same function, but you're adjusting it in the field for each unique weird cut-up residential

rooftop because they are all different.

So you need a wiring harness that can -- that can sort of morph to the unique residential rooftop you're working on. So they are functionally equivalent. They look a little different.

Q. Okay. So I wonder if you can explain a little bit more how Yamawaki provides these adjustable joints that you keep referring to?

A. Yeah. It's, again, kind of clever. I enjoyed this one.

So if you look on the screen, you'll see a red cable and an orange cable -- I see an orange cable. And Yamawaki teaches that you insert like plug in these two trunk cables into these protrusions that stick out: 33A and 33B, the blue and the yellow.

So you have two trunk cables that can be long or short of any length either one of them independently of each other. You plug it in, and what's really cool about that now is, if you want that branch junction to move to the right or to the left, all you have to do is shorten or elongate each branch cable.

And this is how you bring the branch junction to the solar panel instead of bringing the solar panel all the way to the branch junction wasting a bunch of wire.

And then the branch cable, that purple wire on

the left, that does exactly the same thing. It plugs into the green protrusion, 33C, and that's one of the teachings of Yamawaki is all these cables, they're the same size, they plug in in exactly the same way, very standard, very uniform, simple components, with all this built-in adjustability.

And then they're thermal welded together as well. So these protrusions that stick out, 33A, B, and C, Yamawaki teaches you, you insert these cables and you thermal weld it in order to seal it.

So I thought that was -- I thought that was pretty clever too.

Q. So 31, as referenced in the drawing, is a trunk, did I hear you correctly, that the red cable is separate from the yellow cable -- they're two separate cables?

A. That's right.

Q. Thank you. Is there anything about Yamawaki that suggests the need for different size cables?

A. No.

Q. Why would you conclude that to be the case?

A. Well, I mean, for starters, Yamawaki doesn't teach cables of different diameters or different sizes. In fact, Yamawaki teaches the opposite of that.

Yamawaki teaches standardize all the cables, reduce their quantities, keep their sizes small, because

it's easier to bend and turn around these tight, small rooftops, (a), and, (b), so when you go off the rooftop and into the house, you make fewer holes in the walls of the house that are smaller so that you can get the wires into the indoor inverter.

So it's a, yeah, making the wires bigger would go against the flexibility and the teachings of Yamawaki, because bigger wires are harder to flex, they make bigger holes in the walls. That's what Yamawaki is actually trying to fix. It's going backwards.

Q. Okay. And just to clarify, the cable on the right is orange or yellow, depending on what screen you're looking at apparently.

A. Yeah. The one I'm looking at looks orange. Actually it's listed as 16 or 17.

Q. Okay. Thank you. I just want to make sure that we're clear on the record.

A. Yeah. Sorry.

Q. Can you explain what's being shown in this drawing?

A. This is -- these are Dr. Kenny's characterizations of the Yamawaki reference and figures.

Q. And do you agree with these annotations?

A. No.

Q. And these annotations came from Dr. Kenny's

expert report; is that correct?

A. That's right.

Q. And did you hear or were you here in the courtroom to see Dr. Kenny's presentation?

A. I was.

Q. And the drawings, these annotated drawings are similar to what he showed in that presentation?

A. Yes.

Q. Explain to me why you disagree with the notations that Dr. Kenny has applied to the Yamawaki drawings.

A. Sure. So I'll start on the top left drawing.

You'll see a pinkish-purple line that Dr. Kenny designates as the drop line and right next to it the drop-line connector. This is not what Yamawaki teaches.

Yamawaki teaches that is a branch and that it connects to the output of a solar panel, exactly the definition disclosed in the first element of the '153 patent. It's very clear about that.

And what I also find a little weird is, if you look on the image to the right, it actually shows that wiring harness with its branch connecting into a solar panel. But I think Dr. Kenny just relabels it as a drop-line connector probably to make it look as much like a lead assembly as possible.

But when you look at these images and read it, it

is not teaching you connect these so-called drop lines into a wire harness, which is what the definitions of drop line in the '153 patent tell you to do.

Yamawaki teaches you take these branch lines and connect it to the output of the solar panel. That's what it teaches. So I think it is -- it's not fair to relabel it as drop line and somehow it becomes a lead assembly.

And then, by extension, if there is no drop line, there is no nexus, because the '153 teaches us the nexus electrically connects the drop line to a feeder, but there's no drop line so there's no nexus, and so on, there can't be a feeder.

If you look at the bottom left-hand corner of the screen, you'll see the undermold, 33e, the green -- what Dr. Kenny calls the undermold.

Again, Yamawaki doesn't teach there's an undermold, at least not one that's consistent with the definition of the '153 patent or the Markman Order.

In particular, for example, the sealing function I just talked about is done by the thermal welded cables on the outside, not the inside so which -- and those outside protrusions that are sealed and thermal welded is on the component 33f, which is the outer cover member.

The undermold -- so the undermold does no sealing. That's number one.

Number two, in order to -- if there were apertures, and I'll get to that in a second, you can't -- they need to be molded over to create the apertures, and there's no molding over.

This is -- Yamawaki describes it as a molded body. So I would agree it's probably a piece of plastic or it's something molded, but it's not molded over as such to create any apertures. And you can't create any apertures because the wire doesn't thread through. So let me talk about that.

I don't understand all the discussion, frankly, about an aperture in Yamawaki. Yamawaki does not teach apertures. To put an aperture in there would also go against the grain of Yamawaki. If you have a thread -- Yamawaki teaches you insert two cables from the outside into these protrusions. If you have -- if you put one cable in one length, threaded it through this branch junction, I mean, first of all, Yamawaki doesn't teach that all. It doesn't say anything about threading a wire through anything. Yamawaki teaches inserting the cables from the outside, from both directions, two separate cables.

And then just from my common sense, being a person of ordinary skill in the art, threading a cable through 33 is, if you think -- it's really ridiculous. You have to imagine, you're on a residential rooftop, it's hot.

There is a lot of work to do up there. It's not easy work, I've done it, and I'm glad I don't do it anymore.

And wires when they come off a spool are not necessarily perfect. They have got wrinkles in the insulation and they are kind of sticky. They are not smooth. And so you have to put a lot of lubricant on -- if there were an aperture and you needed to thread it, you'd have to go to the end of the cable, wherever it might be on this rooftop, you'd stick this thing on the end, thread it all the way through, get back on the roof or wherever you're trying to get it to.

I can't tell you how crazy that sounds to me being someone of ordinary skill in the art. I don't know anybody who would do that. And then you'd hit all these kinks in the wire and you'd -- I can imagine all these installers hating me if I designed something like this with an aperture, because they would have to be trying to force it through and have to pull it out and doing that over again. I just -- Yamawaki does not teach apertures, plain and simple.

Q. Let's talk about that just a little bit more. Does Yamawaki -- you've highlighted some of the claim language there, and this is -- what claim is this from? Can you recognize where this comes from?

A. This is the first claim of the '153 patent.

Q. Does it disclose a first aperture extending completely through the undermold and having a first diameter wherein the feeder cable extends through the first aperture along a first longitudinal axis?

A. Yamawaki does not teach that claim, that element.

Q. And what does it teach?

A. It teaches you insert the wires from the outside and you thermal weld it from the outside, probably with a heat gun, I would assume, but that's -- yeah. And you would do that in order to facilitate an electrical connection, which is shown by the dashed lines in the middle.

Q. But we don't know what affects that electrical connection in the middle?

A. It's not -- it's, unfortunately, not very clear in Yamawaki how that electrical connection is made. But I think it is clear that there's an electrical connection being made.

Q. Mr. Weiner, is it your understanding that Dr. Kenny admits that Yamawaki does not teach some of the elements of the claim?

A. Yes.

Q. And what elements does he admit that Yamawaki fails to teach?

A. I agree with Dr. Kenny that Yamawaki does not teach a second and third aperture having different diameters

from the first aperture, and that Yamawaki doesn't teach a third aperture and a second drop line.

Q. Did you in connection with your, I think you mentioned earlier so I think I know the answer to this, but did you review the prosecution history for the '153 patent?

A. Yes, I did.

Q. And was Yamawaki present in that prosecution history to your knowledge?

A. Yes, the Patent Examiner introduced it.

Q. And did the Patent Examiner allow claims over Yamawaki?

A. Yes.

Q. So does Dr. Kenny introduce another reference to correct the deficiencies that he has admitted to?

A. Right. Dr. Kenny proposes combining Yamawaki with Shao to get these three elements.

Q. And do you recognize what's on this slide?

A. Yes. This is the Shao reference. The Shao teaches a K-shaped branch structure, which is an AC distribution device inside of a building to consolidate two branch joints into one, in a more compact structure.

Q. So when you say "AC distribution," explain that a little bit more.

A. Yeah. Well, Shao was trying to solve the problem of making more efficient AC distribution branch cables

inside of a building between floors of a building.

I'm imagining like vertical floors, like a tall building. And the figure in front of us is oriented vertically with two branches.

So the idea was that Shao introduced was putting these in between floors so you could run basically with one joint, you could get two floors of branch circuit cables.

Q. And it distributes power?

A. Yes. Yes, distributes power inside a building, that's right.

Q. Okay. And does it teach anything relating -- does it mention solar anywhere?

A. Nope. The word "solar" doesn't show up once -- nowhere.

Q. And does that surprise you?

A. No, because there's a lot of stuff out there that has nothing to do with solar, I guess. It does surprise me, sorry, that it is being introduced in this context because it's not -- I don't consider it analogous.

Q. What kind of power does a solar system generate?

A. DC.

Q. Does Shao -- where is Shao intended to be used? I think you mentioned -- where is it intended to be used?

A. Inside of a building, indoors.

Q. Okay.

A. Yeah.

Q. And, in your opinion, Mr. Weiner, as one of skill in the art, would one look to the Shao reference to inform solar component design decisions in your mind?

A. No way.

Q. And why is that?

A. It's an AC device inside a building, and a solar system is outdoor and it's DC. And I've seen actually engineers make this mistake where they find an AC device and throw it into a DC system and it's egregious. It causes code-enforcement issues and errors and omissions.

AC is a weaker rating than a comparable DC device. So you'll often see, like, just picking an example, like a fuse holder might be rated for 240 volts AC, but it will only be rated for 48 volts DC.

DC is considered a heavy-duty rating. It is harder to get. AC is just a little weaker. It's self-extinguishing by nature of the type of electricity it is.

So you just would never, ever look to an AC device to integrate it into a DC assembly unless you were looking for trouble in my opinion.

Q. And can you tell me what the field of endeavor, so to speak, is for the '153 patent?

A. I agree with Dr. Kenny on this. The '153

patent's field of endeavor is for use -- is a solar energy installation, a solar power system. I don't disagree with Dr. Kenny's characterization of the field.

Q. And the field of endeavor for the Shao patent?

A. AC power distribution inside of a building.

Q. What is the problem being addressed by the '153 patent?

A. The '153 patent is focused on how to get power from solar panel arrays all the way over to an inverter without using a combiner box.

The Shao patent focuses on enabling single-branch joints by combining them into a double-branch AC power distribution system between floors of a building. It's trying to reduce the number of joints and creating a more compact structure that's tighter inside of a building.

Q. So two different problems?

A. Two different problems. Two different fields of endeavor. AC/DC have nothing to do with each other. I would never look to Shao to modify Yamawaki.

Q. And do you recognize this drawing?

A. I do.

Q. Can you explain what's shown here?

A. Well, this is Dr. Kenny's characterization of the Shao reference, Fig. 1.

Q. Do you agree with it?

A. Nope.

Q. And why is that?

A. Well, I mean, first of all, all the phrase -- all the phrases, you know, I've read the '153 patent way too many times, and all these phrases are all in the '153 patent all in a very specific context with specific definitions all of which have to do with solar, but Shao has nothing to do with solar. So I can't agree with really any of the labels here.

Moreover, the way he rotated the image to run horizontally is also a mischaracterization of Shao, I think. When I read Shao, Shao is running cables vertically between floors of a tall building. That makes sense to me. But when you rotate it, it does look like he is trying to make it look like a lead assembly. We saw pictures throughout this trial of a lead assembly running horizontally through a huge solar field. So I can --

If you were trying to make this look like a lead assembly, that's how you would do it. You would rotate it, relabel it, but I just can't -- I can't agree to that.

Q. In summary, do you agree, Mr. Weiner, with Dr. Kenny's proposal to modify Yamawaki in view of Shao?

A. I can't.

Q. Can you explain why you come to that conclusion?

A. Well, for starters, as I said, there's no

apertures in Yamawaki, so there's no motivation to change something that doesn't exist.

And then the different size diameter cables of Shao doesn't make any sense in the context of Yamawaki. Yamawaki wants to standardize all the cables, make them smaller and fewer in quantity to get -- for better flexibility around rooftops with tight corners, and to get into a building more efficiently.

Using Shao to make bigger wire just makes that wire harder to bend, bigger holes in the side of the house, not what homeowners -- not what Yamawaki teaches.

And then the crimped wires of Shao also, once you crimp, a crimped wire would fix these branch junctions along the trunk, but the whole point of Yamawaki is to allow flexibility and adaptability.

So you don't show up with a bunch of already precrimped wires, say, in the manufacturing process, which is also what Shao teaches. Shao teaches you manufacture all the Shao stuff offsite in a manufacturing facility, you show up, and you lay all the wires out inside in the building. It's super efficient.

Yamawaki does not teach that. Actually the opposite. Yamawaki says, show up with all your equipment, but field assemble it, because every rooftop is different and you need a flexible, adaptable thing to solve the

residential problem.

And so even if -- oh, and then also the consolidation of joints. Shao is consolidating two joints together. Yamawaki wants them distributed. Yamawaki wants you to bring the joint to the solar panel, not the solar panel to the joint.

So if you had to lock -- if you can only do two joint branch junctions in Yamawaki, you'd have all these longer branch cables, and that was the problem Yamawaki -- one of the many problems -- Yamawaki wanted to solve.

So even if I could convince myself that I would be motivated to do all these things, I still, to this day, even after listening to Dr. Kenny, I still don't exactly understand how he proposes actually physically connecting Shao with Yamawaki. Like, would you -- I get that you would replace the 33 in Fig. 9A, the 33 box, the branch junction. I get that -- I suppose you would take that out and put Shao in, but then maybe -- I don't know if you would thermal weld it, like Yamawaki, or maybe you ditch the --

I don't know if you'd -- I don't know how he would combine these two things together. I tried to do it, because I wanted to see if I could and I can't, and I haven't heard an explanation from him yet. I would love to know.

Q. Okay. Thank you very much.

MR. MASCHOFF: That's all I have, Your Honor.

CROSS-EXAMINATION

BY MR. OU:

Q. Good afternoon, Mr. Weiner.

A. Good afternoon.

Q. Mr. Weiner, this is your first time testifying at the International Trade Commission, true?

A. True.

Q. And this is the first time testifying in a case involving allegations of patent infringement, right?

A. I'm working on patent invalidity, not infringement.

Q. This is the first time that you're working on a case testifying that involves a patent, right?

A. Yes.

Q. And before this case you never provided expert opinions on whether a patent is valid or invalid, right?

A. That's right.

Q. And you've never provided expert opinions on whether a patent is infringed, right?

A. Right.

Q. You've never previously offered opinions where you had to determine how a person of ordinary skill in the art would understand terms in a patent, right?

A. Right.

Q. And in this investigation, in forming your expert opinions for your report, which you served back in January, right?

A. Yes.

Q. Rebuttal report was in January 2024, right?

A. Yes.

Q. In that report, you, on your own, came up with your independent opinion as to what the term "aperture" in the '254 and '153 patents means, right?

A. Yes.

Q. You did that on your own by reviewing the specification, the entire file history, and the intrinsic record, right?

A. Sorry. What was the last thing you said?

Q. The intrinsic record.

A. Oh. Yes.

Q. You looked at the patent, the patent has claims, it has a specification. We know it has a lot of figures. It's got a full file history. And then you looked at all of that in order to determine what you believe is how aperture should be used in the claims of these two patents, right?

A. You say in these two patents?

Q. The '254 and the '153 patent.

A. Yes.

Q. And Mr. Maschoff, also, I think, asked you on

direct examination, reconfirmed that you reviewed the prosecution history, the file history, right?

A. Yes.

Q. That's not what you said in your deposition, though, sir. In your deposition -- if we can pull that up at page 48 -- do you remember in your deposition I asked you:

"To the extent that you did review any portion of the file history for any of the patents, you reviewed it -- you reviewed the portions that Shoals' counsel provided you, right?"

And you said, "that's right."

In other words, they made the determination as to what they thought would be relevant for you to review, right?

You said, "Bingo. That's right."

And then I asked:

"So if there was a portion of the file history that was relevant but they decided not to give to you, you would not know one way or the other. Is that fair?"

And you said, "I believe -- that's right."

Did I read your deposition testimony correctly, sir?

A. You read it correctly, yeah.

Q. I got it right, right, in your deposition? I

read it correctly, yes?

A. Yeah, the things I didn't --

Q. Sir, you can wait for Mr. Maschoff to redirect. Okay?

A. Okay.

Q. And so at the time of your deposition, you admitted that you did not review the full prosecution history, true?

A. Yes. Stuff like administration, filing -- price of fees paid, and there was a bunch of -- my understanding there is --

Q. Sir, in your deposition, you admitted that you only reviewed portions of the file history; you did not review the full file history, right?

A. That's fair.

Q. Other than a copy of "the electric code," I think that's the National Electric Code that you were referring to, the universe of material that was provided for you for purposes of forming your opinions, it was everything that Shoals' counsel decided to give to you, right, meaning there wasn't any -- any document other than the electric code that you asked for. Yes or no?

A. No.

Q. Okay. Can we pull up your deposition again? Let's go to page 51.

Sir, in your deposition, I asked you:

"Other than The Electric Code, those were provided to you by Shoals' counsel, right?"

"Yes.

"And they selected what to provide to you, right?

"Yes.

Is that what you said in your deposition, sir?

A. I would need to see more. I think this is not a fair characterization.

Q. All right. I'll let Mr. Maschoff, if he thinks he can redirect you and that you actually did ask for something more, I'm sure he'll ask.

Mr. Weiner, is it true that in forming your opinions for your expert report, you had a construction of the term 'aperture' in mind? I think you already agreed with me that you -- you had your own opinion as to what aperture means, right, at the time of your report?

A. Can you ask that one more time?

Q. Sure. At the time you issued your report you believed that aperture meant all or part of a pathway of feeder cable/drop line through a mold, right?

A. I believe -- are you reading that from my report? That sounds right.

Q. And that's the construction that you applied in analyzing Dr. Kenny's report in preparing your rebuttal

opinions, right?

A. In my report, yes.

Q. Now you'd agree with me that aperture is a term that's only used once in the patent specification, right, so ignoring the claims, it's only used once, and it has to do with that one zip-tie holder that you've seen already. Would you agree?

A. I don't recall off the top of my head, but I'll take your word for it.

Q. Sitting here today, you're not aware of any disclosure in the patent specification, the written specification, that describes an aperture in any other way, fair?

A. Off the top of my head, from memory, I can't recall. I'd want to look through the patent and see if I could find it to give you a hard yes or no. But it's definitely in the claims and I focused a lot on the claims.

Q. You said you focused a lot on the claims. Is it correct, though, sir, that, in deciding what you thought aperture meant, you reviewed the entire specification and the entire intrinsic record?

A. Yes.

Q. Yes? Mr. Weiner, you've been here all week. I know there's portions that maybe you hadn't seen because it's been on the confidential record, but you've been in the

courtroom when other witnesses have testified at certain times this week, right?

A. I've heard other witnesses throughout this trial, yes.

Q. And so you've heard a lot of discussion about the term "aperture," whether or not an aperture extends partially through and completely through.

A. (Nodding head up and down.)

Q. And there's some disagreements, right? Yes?

A. Yes.

Q. You'd agree there are disagreements, right?

A. Yes.

Q. And you have your own opinion that you formed, right, as to what is an aperture, right?

A. Well, today I used the Markman Order.

Q. Okay. Today you used the Markman Order. The Markman Order is different than the opinion as to what you had at the time of your report, true?

A. True, and I agree with the Markman Order.

Q. Now when you issued your report, do you remember there was the '254 patent, you know that that's the parent patent to the '153?

A. Yes.

Q. And they share the same specification, right?

A. I believe so.

Q. Okay. You've seen witnesses talk this week and kind of walk through the file history, how the original claims of the '254, and then eventually they were allowed with the 113-word amendment, and then that claim 1 became the claim 1 in the '153 as applied for.

Were you here when, for example, Dr. Cameron walked through that history of the file history this morning?

A. Some of it.

Q. You know that history too, though, right, you're familiar with it?

A. Which history?

Q. Yeah, how the claims of the '153 patent ultimately were allowed. You know the history, right?

A. Yes.

Q. You know that there was original claims and then the original claims were rejected and then there was an amendment and then ultimately they were allowed? You studied all that in forming your opinions, true?

A. Yes.

Q. Now I want to take you back to when you were analyzing the '254 patent, okay, for your rebuttal report, a few months ago.

Now, in your opinion, how does a person of ordinary skill in the art use your definition of aperture

and know when you look at all of the pathway or part of the pathway when you're looking at claim 1 of the '254 patent?

A. Could you ask the question again?

Q. Sure. Let me break it up for you actually.

Can we pull up Staff's Demonstratives Exhibit SDX-2?

Can we go down to where we have claim 1 of the '254 patent? I thought you had a slide that had the '254 and '153 claims next to each other.

Can we just pull up the '254 patent?

Now let's go down to claim 1.

So, Mr. Weiner, at the time of your report, your construction of aperture was all or part of a pathway, all or part of a pathway of a feeder cable or drop line through the mold, right? There was an all or part of a pathway, right?

A. In my understanding of aperture?

Q. Yes.

A. Yeah. Yes.

Q. And so at that time, when you were looking to see whether or not an aperture was extending completely through or partially through, how would a person of ordinary skill in the art know to use all or part of the aperture of the pathway?

A. In the context of the '254?

Q. In the context of the '254. Do you remember how you did that analysis?

A. Actually I don't remember off the top of my head.

Q. That's okay. I'll change gears a little bit.

Mr. Weiner, you said that the '153 patent is specific to utility solar installations, right?

A. When you say I said that, in what context did you say I said that?

Q. From your perspective -- tell me if I've misunderstood your testimony today, okay.

You, for example, have said that you don't believe that Dr. Kenny is a person of ordinary skill because he doesn't have experience in utility-scale PV solar, right? That's one of the reasons, right?

A. I don't recall saying that.

Q. Okay. You have said that the Shao reference would not be analogous art because it's not solar and it's not even utility-scale solar, right?

A. I didn't quite say it that way.

Q. But that's generally your view, right? Like, you put Shao in a different bucket because it has -- it's not a solar reference in your view, right?

A. I don't believe Shao is analogous art because it doesn't mention solar at all, and I don't believe Dr. Kenny is a person of ordinary skill in the art because he has zero

solar experience or any specific solar education that could substitute.

Q. Okay. And then the Yamawaki reference, you distinguish the Yamawaki reference, I think you said, that because it involves rooftop solar installations, true?

A. What was the question?

Q. Rooftop solar installations, that's how you were distinguishing Yamawaki, among other things, right, but you argued that Yamawaki is directed to rooftop solar installations, right?

A. If the question is Yamawaki is directed to residential rooftop solar installations, my answer is yes.

Q. Okay. And you know, sir, that the term "utility-scale solar installations" is not in any claim of the '153 patent, right, sir?

A. Yes.

Q. And so to be -- to have an EBOS solution, okay, to have a harness solution, it doesn't have to be in the utility-scale solar installation in order for it to meet the '153 patent claims, right?

A. That's right. It just has to be in a solar installation; it doesn't have to be utility-scale.

Q. And I think you said, sir, that the '153 patent, because this is a solar installation, it had -- it used very specific terms specific to solar, right? You said that in

your direct testimony?

A. Sorry. Say that one more time?

Q. I heard in your direct testimony that you were describing the '153 patent and you said that the claims used words that were very specific to utility solar, like lead assembly.

A. That's not my testimony.

Q. It's not your testimony?

A. No, it's not.

Q. You would agree, though, that the harnesses that are disclosed in the '153 patent, a person of ordinary skill could use that in a different application that wasn't solar, right?

A. Not in the context of the '153 patent.

Q. You believe that the concept of the '153 patent is limited to solar installations, right?

A. Yes.

Q. And are you familiar with Shoals' BLA product?

A. Not very.

Q. Not very.

A. Outside of this case. I mean, like the patent, I'm familiar with it.

Q. Really? That's interesting. So you're an expert in solar and you've been working in solar for almost two decades, right?

A. Yes.
Q. And in utility solar installations in the United States, right?
A. For about half of that time, yes.
Q. Have you been in the courtroom this week when we've heard from so many Shoals' witnesses how Shoals revolutionized the solar industry with its BLA product?
A. I have heard all of that.
Q. But you just -- you just said that, until this case, you hadn't even heard of Shoals' BLA product? Is that what you said?
A. That's right. I tend to get more involved in the complex, challenging work involved in solar.
Q. I don't need a further explanation. I just wanted to confirm.
A. It's a simple product actually.
Q. Mr. Weiner, let me show you one of your slides.
Actually, do we have his slides, Mr. Brooks? Can we just pull up slide CDX-16.8?
Mr. Weiner, this is your slide, CDX-0016.8, and it has the Markman Order in this case, right? It has the relevant terms from the Markman Order that you used in your direct testimony today, right?
MR. MASCHOFF: Your Honor, this appears to be a different Markman Order for different claim terms. It is a

different slide. It's the wrong slide.

MR. OU: Is this the right one?

MR. MASCHOFF: Yeah.

MR. OU: Okay.

Q. Okay. Mr. Weiner, this is from your direct testimony, right, this slide?

A. Yes.

Q. And this shows the claim constructions that you applied in forming your opinions that you gave on direct today? Yes?

A. Yes.

Q. And do you see the term "aperture" and the Court's construction of aperture is "the entire pathway of the feeder cable or drop line within the undermold or primary mold when viewed as if the feeder cable or drop line were removed."

Did I get that right? That's the construction?

A. You read it right.

Q. And you have an understanding as to what that construction means, right?

A. I do.

Q. Now you've been here this week and you've heard that there's been some disputes about what is a drop line, right?

A. Yes.

Q. And you formed an opinion as to what is a drop line in order to apply this construction for your opinions, right, sir?

A. Yes.

Q. Now I wanted to ask you, you were here this morning for at least part of Dr. Cameron's testimony, right?

A. Yes.

Q. Can I get the ELMO, please?

Mr. Weiner, were you here this morning when Dr. Cameron was asked to elaborate on her interpretation of the Court's claim construction for aperture given the disputes about what drop line means, and do you see at the bottom where Dr. Cameron explains, for me, you know, an aperture is really -- it's just a 3D hole. So as in the entire pathway for a cable in the undermold or primary mold that exists when it's viewed when the entire cable has been removed.

Do you see that, Mr. Weiner?

A. Yes.

Q. And I just want to know whether or not Dr. Cameron's clarification this morning of how she is viewing the Court's Markman Order, whether or not that's consistent with how you read the Court's Markman Order and applied it in your opinions.

A. I haven't thought about it. If you give me a

minute I'll --

Q. Sure, yeah, please.

A. It looks -- that looks kind of consistent to the Markman Order.

Q. Right. Do you have your -- do you have your slide that has the construction so that you can see them side by side?

A. Yes. Except the only -- the only problem I have with her comment, though, is that she -- she uses "cable" instead -- yeah, she keeps using "cable" when she should be using "feeder cable or drop line."

Q. You disagree with the use of cable to identify instead of feeder cable/or drop line? Is that what you're saying, that's where the dispute is for you?

A. So, yeah, she uses cable instead of feeder cable or drop line. She also uses "overmold," but my understanding of aperture is it doesn't have to create a pathway through the overmold, it needs to create a pathway through the undermold.

Q. I think she says, "sorry, in the undermold or primary mold."

A. Yeah, okay, that's better. That exists... when it's viewed -- and then down at the bottom where she says, "when the entire cable has been removed," I would put feeder cable or drop line. Otherwise, it looks pretty consistent

at a glance.

Q. I want to focus in on the differences because you consider yourself a person of ordinary skill, right?

A. Of course.

Q. I don't think you're challenging that Dr. Cameron is a person of ordinary skill, right?

A. I haven't thought about it, but I'm not sure that I would automatically consider her a person -- I value experience, as a substitute of experience, education-specific, solar education specific. There's more solar-specific education out there, so --

Q. Sir, I got limited time. So Mr. Maschoff can let you give the further explanation. I don't want to be rude and cut you off.

A. Sorry.

Q. Okay. So let's talk about what it seems like you and Dr. Cameron do agree on.

You do agree that you would use -- you agree that we're talking about pathways through a mold, right, and it's got to be entire pathways. Do you agree?

A. Yes.

Q. Okay. And you agree that you remove -- I'll just say a part or a piece for now -- from the mold that, basically, is what forms the mold when the injection molding goes over it, right?

In other words, the apertures are formed when you have, for example, a cable, you form a mold over it, and then when you remove the cable, that's where you have your 3D hole or entire pathway, however you want to call it, right?

A. Using cable, but I would prefer we stick to the Markman Order.

Q. Okay. We'll stick to that. You agree, though, that, okay, a feeder cable is a cable, right, sir?

A. Yes.

Q. Okay. And in the context of the '153 patent, the feeder cable is generally -- can we call it the larger cable that goes through the mold?

A. It's the larger -- sure.

Q. Okay. And the drop line, the drop line is another cable going through the mold, right?

A. Again, sure. I don't like your use of the word "cable" because I'd like to stick to the terms in the patent and the claims, but let's keep going.

Q. Is there a difference between using the term "cable" and "line" in your opinion as a person of ordinary skill when we're talking about the structure of the mold and what those apertures look like?

A. There's a very big difference between drop line and cable feeder and cable. These phrases "drop line,"

"feeder," you know, "mold," they're all very strictly defined in the '153 patent, so I would stick to those definitions. I wouldn't mix them up.

Q. Do you agree that, however you understand aperture, it should be the same for the feeder cable and the drop line? Would you agree with that?

A. Well, there is a first aperture, a second aperture, and a third aperture, and so those have differences in the way they're described. So I guess when you talk about which aperture -- first, yeah.

Q. Sure. Okay. We'll do it that way.

Do you agree that, however you understand aperture, okay, we know that the first aperture is associated with a feeder cable, right, in the '153 patent claims? And the second aperture is associated with a drop line, right?

A. Yes.

Q. Both the feeder cable and the drop line, those are physical structures, right?

A. What do you mean by "physical structures"?

Q. I would call them cables, but you don't want to call drop lines cables. I'm trying to find a term that we can agree on, which is something that a mold forms over and then you pull it out and there's a hole, okay?

A. An aperture, yes.

Q. So what can we call the physical structure that is, when you pull it out, it forms a 3D hole going through the mold? Pick a term.

A. That's fine. Now that I understand how you mean it, I understand what you mean, and let's keep going.

Q. Okay. Great. So you would agree that, when you look at the first aperture, okay, the first aperture that's associated with the feeder cable, and the second aperture that's associated with the drop line, okay, and then you're going to remove it from the mold so that you have a 3D hole, right, you should be viewing it the same way, right? You should be viewing the apertures in the same way. Do you agree?

A. Yeah, I think so.

Q. Right? There's no reason to treat them differently, right?

A. I don't know what you mean by "treat them." I can look at both apertures in the same way.

Q. Right. I just want to make sure that I'm understanding how you're viewing aperture, okay? Let's look at it this way, Mr. Weiner.

Do you have any familiarity with just general manufacturing process as to how the cable assembly that's in the '153 is made so, you know, it describes you have cables, you strip the insulation such that you have exposed wires,

you use a compression lug that creates an electrical connection, and then you put a mold around it -- let's call that the undermold or primary mold -- and then you put a second mold around that -- let's call that the overmold -- right, that's generally what the '153 patent describes? You agree, right?

A. With drop lines and feeders, yes.

Q. With drop lines and feeders, right? Okay.

Can we put up Fig. 7?

So, Mr. Weiner, going back to apertures, right, you're familiar with this figure, right, sir?

A. Yes.

Q. Okay. And 14, that's the feeder cable, right?

A. Yes.

Q. 12 is the drop line?

A. Yes.

Q. Right? And the kind of car-looking shape, the outside, it doesn't have a number for it, can we just call it the mold for now?

A. Sure.

Q. That could be the primary mold, it could be the undermold, right?

A. Sure.

Q. And 20 is the compression lug and 18 is the exposed wire, right, that's going through the compression

lug, right?

A. Okay.

Q. You follow me? We're in agreement, right?

A. Okay.

Q. So now let's look at the Court's test for aperture, right, and also Dr. Cameron's test. I really want to understand where you see that there's a difference, if there is one.

MR. YONAN: Your Honor, I think we're out of time.

JUDGE BHATTACHARYYA: Who is out of time?

MR. YONAN: Withdrawn. Sorry.

JUDGE BHATTACHARYYA: Okay.

Q. Mr. Weiner, are you with me?

A. (Nodding head up and down.)

Q. We've got a first aperture, a second --

MR. MASCHOFF: I object. It's going way beyond the scope of the testimony he has already provided. He didn't even look at this figure.

JUDGE BHATTACHARYYA: The objection is overruled. We're going through the terms that he applied in doing his analysis.

MR. OU: Thank you, Your Honor.

Q. So, Mr. Weiner, you agree with me, we have a feeder cable, and, with that feeder cable, there's a first

aperture, right?

A. Yes.

Q. And then you have a drop line, and with the drop line is associated with a second aperture, right?

A. Yes.

Q. And then aperture, under the Court's construction, is the entire pathway of feeder cable when we're talking about the feeder cable and the drop line when we're talking about the drop line, right, within the mold, when viewed as if the feeder cable and the drop line is removed, right? That's the Court's construction.

A. Yes.

Q. And my question for you, sir, is that do you look at the apertures to determine whether or not they extend partially through or completely through, do you do that differently depending on if you're looking at the feeder cable or the drop line or its associated apertures?

A. Sorry. I don't know what you mean by do I do that differently. I see the first aperture. I see the feeder cable. I see the drop line. I see the second aperture. What is it I'm doing? What do you think I'm -- what are you asking me that I'm doing differently?

Q. So you have to remove a part, right, sir, when viewed as if the feeder cable or drop line were removed, right?

A. Okay. To identify the aperture?
Q. Right.
A. Okay.
Q. Yeah. You agree, you have to remove a part and then you see -- and then you look at the 3D hole, right?
A. Right.
Q. Okay.
A. What's different, though?
Q. So what I'm asking you, remember, we started -- I wanted to understand whether or not you agreed or disagreed with Dr. Cameron's interpretation.

Dr. Cameron tried to clarify the Court's construction with what she said today during her direct. I'm trying to understand whether or not you agree with it or not.

A. Yeah, but you asked me what would I do differently, and I'm trying to figure out what do you mean -- not Dr. Cameron -- what would I do differently in looking at the aperture, is that --
Q. Can we put up Dr. Cameron's one more time, please, the LiveNote?

MR. MASCHOFF: Your Honor, again, I object. We have gone over this. The question has been asked. The witness has answered it. Now we're just badgering him to get the answer that he wants.

JUDGE BHATTACHARYYA: I understand your concern. I'm going to let Mr. Ou proceed, if he wishes.

Q. Let me try one more time, okay?

So you have Dr. Cameron's explanation that she gave on direct this morning, okay, up on the screen, right? And I want to make sure, maybe -- I want to make sure that we're on the same page in terms of how we understand what she said.

She says, a 3D hole -- you understand what a 3D hole is, right?

A. I don't know what she means by a 3D hole. I know what aperture means.

Q. Okay. How about a 3D hole as in the entire pathway for a cable in the mold that exists when it's viewed when the entire cable has been removed, can you have in mind what that is?

A. Yeah. We did that.

Q. Okay. Great. So if we put up Fig. 7, if you were to apply Dr. Cameron's view of the Court's construction and you were to look at the aperture associated with the feeder cable, right, we're going to take the feeder cable and we're going to remove it, right. Do you agree?

A. I follow you.

Q. Right? We're going to remove it from the mold. We're going to take it out, and then we're going to look at

the 3D hole, which is the entire pathway when the feeder cable is removed. Do you follow me?

A. Okay.

Q. And so just looking at Fig. 7, you would agree that that aperture goes all the way through, right?

A. Yes.

Q. Okay. Now, if you look at the top -- the drop line, right, okay, in Fig. 7, same thing, right? We're going to take the drop line and we're going to remove it.

MR. HARRIS: Your Honor, if 5:15 is the end, by our calculation, I don't think we've had a chance to confer yet because we're in the middle, but Voltage is out of time. We still have one rebuttal witness left to put on the stand. Mr. Shin hasn't had a chance to talk to Mr. Weiner yet either.

At least, by our estimations, we have eight minutes left, but Voltage is out of time, and we still have one witness left. So I wanted to bring that to the Court's attention.

JUDGE BHATTACHARYYA: If Voltage is out of time, then Voltage is out of time.

MR. OU: Your Honor, if I'm out of time, then -- I'd like to just wrap up this last question, but, if not, then I can --

JUDGE BHATTACHARYYA: I think we should --

MR. OU: Thank you, Your Honor.

EXAMINATION BY COUNSEL FOR ITC STAFF

BY MR. SHIN:

Q. Good afternoon, Mr. Weiner. I have just a few questions.

Earlier in your direct testimony did you provide any rebuttal opinions to Dr. Kenny opining that aperture is potentially -- or that aperture is indefinite under section 112? Did you provide any opinions rebutting that?

A. Rebutting Dr. Kenny's opinion that the claims are indefinite?

Q. That aperture, the term aperture, is indefinite.

A. I believe I have rendered an opinion on that.

Q. What was that opinion?

A. That it is -- the claim is definite.

Q. Okay. But, I mean, do you have any other details to rebut Dr. Kenny's opinions that he gave earlier today on that issue?

A. I mean, I understand what it means. When I read the art, I understand what the claim means by aperture and I know how to apply it.

Q. Okay. I just --

A. Very definite to me.

Q. I understand. During your direct testimony I didn't see any particular slide or anything addressing a

rebuttal, but your opinion is that aperture is not indefinite, right?

A. Yeah. I don't recall if there's a slide on it, but my opinion is that it's definite.

Q. And you were here in the courtroom when I asked Dr. Kenny questions; is that right?

A. Yes.

Q. Okay. I'd like to pull up Fig. 35, a demonstrative I used with Dr. Kenny.

Do you recognize this picture from before that I used with Dr. Kenny?

A. I do, and I forgot the details.

Q. Okay. Well, this is Fig. 35 from the '153 patent, you understand that, right?

A. I do.

Q. And the highlighting was to represent various different lengths of the aperture that could possibly be interpreted by different people.

So the bottom longest length is using the Cable Test where you use the entire drop line, and you see from Fig. 35, element 12 is the drop line, right?

A. Well, I struggled with this, because there's no mold, so I can't see apertures, and so it's hard for me -- it was hard for me to follow this, to be honest.

Q. Even without the highlighting and undermold, do

you see that element 12 identifies a drop line that goes from the right all the way to the left? Is that your understanding as well?

A. No. The drop -- there's two drop lines. It doesn't go -- so there's a drop line on the right and there's a drop line on left, two.

Q. But this is before the final product, and the applicant had this marked as element 12 and the specification describes it as a drop line with no indication that there is a second drop line. Is that fair to say?

A. I don't recall the specification description. But I know the claims really well and there's two drop lines.

Q. Okay. You said that you don't know where the undermold is, but, given the Court's claim construction of aperture, how would you describe where that -- where that second aperture corresponding to the drop line begins and ends?

A. I can't describe it at all. There's no mold. Apertures are pathways in a mold.

Q. But if you can imagine an undermold over this, can you just describe -- there would be a void, but we've got the wire there. Can you sort of describe the length of the wire corresponding to the length of the void in the undermold?

A. So the drop line aperture, either the second or the third, depending on which one we're looking at, it would extend from the nexus to the edge of the undermold.

Q. And is that consistent with Mr. Brooks' testimony?

A. With whose testimony?

Q. Mr. Brooks. I don't know if you were here for that.

A. I believe -- I believe it is. Yeah, I believe, if I recall correctly, when the drop line meets the nexus, it has done its job. I think that's what I recall his testimony. And I think I agree with that, yeah, I agree with that.

Q. All right.

MR. SHIN: Thank you, Mr. Weiner.

Your Honor, I've marked this as SDX-3 for the record.

MR. OU: Your Honor, I know I'm done. Can I just mark the LiveNote that we had shown as RDX-017 for the record?

JUDGE BHATTACHARYYA: All right.

MR. HARRIS: Your Honor, I think we'll call our final witness, and I think he can be very quick.

JUDGE BHATTACHARYYA: Okay.

You may step down. Thank you.

THE WITNESS: Thank you.

MR. HARRIS: We'll call Clarke Nelson. Thank you.

CLARKE NELSON,

having been first previously sworn or affirmed on his oath, was thereafter examined and testified as follows:

MS. TRINH: Your Honor, to expedite things, can we go on the confidential record for Shoals?

JUDGE BHATTACHARYYA: We're moving onto the Shoals confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

MR. COYLE: Good evening, at this point, Your Honor. Thank you for your patience. Jordan Coyle again for Voltage.

Your Honor, the issue unfortunately goes back to JX-118, which you've heard a lot about, the Intertek Report. We've talked a lot about whether and how Mr. Brooks could refer to the Intertek Report, sorry, the Shoals Intertek Report in his testimony.

What happened was, during the course of his testimony, the Intertek Report was cited, JX-118, in the footer of two demonstrative exhibits. When counsel was examining the witness, counsel read those exhibit numbers into the record. The witness essentially confirmed that he relied on those exhibits in offering his testimony.

Our concern, of course, is that now this creates the implication that he offered testimony on that exhibit. And, in particular, our concern is that that testimony could be used in furtherance of a technical prong argument that we don't think is within the scope of what's allowed, or a representativeness argument.

There were representations made on the record at the beginning of Tuesday's testimony. For example, counsel said, as part of the agreement between the parties, we would not seek to offer the Shoals Intertek Report through

Mr. Brooks, which they did not do. And then he went on to say he won't give any further testimony about the Shoals Intertek Report, which obviously he did.

Then later on, Your Honor, on page 263 at line 7, counsel said, just to clarify, Your Honor, the slide deck we'll use today will have the Intertek Report in it, but before we submit it we'll pull those pages out. There may have been full pages that reference the report, but certainly not all the citations to it came out.

JUDGE BHATTACHARYYA: What's the relief that you're seeking?

MR. COYLE: We think the appropriate course, Your Honor, would be to strike references to CX-118 from the transcript and from the two slides that Shoals put up. We have been attempting to meet and confer with the other side about this. Have not been able to reach agreement.

I realize it's late in the day, Your Honor, and I don't mean to bother the Court any longer. One of the agreements, the proposals we would be willing to accept, even though it's not ideal, would be just an understanding or instruction or stipulation -- instruction from Your Honor -- or stipulation with Shoals that they will not use the fact that counsel read these exhibit numbers into the record to argue that the witness testified about these -- about this exhibit during the course of his

testimony, particularly as it relates to representativeness.

Again, that's not an ideal solution from our perspective, Your Honor, but given the time, we're willing to accept that as a means of trying to protect the record a little bit.

JUDGE BHATTACHARYYA: Mr. Barquist?

MR. BARQUIST: Your Honor, if I could explain what they're asking.

Could we put up CDX-5.124, please?

So, Your Honor, we did not offer the Intertek Report through Mr. Brooks, as you know. He did not testify about it any further after Your Honor's ruling.

What we're talking about is the image at the top --

MR. HARRIS: Is this confidential?

MR. BARQUIST: Can I see it again real quickly?

MR. HARRIS: It probably is.

MR. BARQUIST: I'm sorry. The slide is confidential, so I guess I have to ask the Voltage folks to leave. Sorry.

JUDGE BHATTACHARYYA: All right. Moving to the Shoals confidential record.

(Whereupon, the hearing proceeded in confidential session.)

O P E N S E S S I O N

JUDGE BHATTACHARYYA: That's fine for the parties to keep them, keep the physical exhibits. I may want to see some of the physical exhibits, particularly the cross-sections, but I'll specifically request them. Until then, you can submit photos for the physical exhibits and keep the physical exhibits in your offices.

Does that make sense?

MS. KIM: Yes. Understood.

MR. COYLE: Yes. Thank you, Your Honor.

MR. CHAIKOVSKY: Beyond the physicals, in terms of the hard drives of the CT scans of Dr. Cameron, would you like that treated -- I mean, also in accessing it, obviously there were the videos that were used during Dr. Cameron as demonstratives, but there is actually the evidence on there with CT scans and images on there, Your Honor.

JUDGE BHATTACHARYYA: You're planning to mark them as physicals --

MR. CHAIKOVSKY: Yes.

JUDGE BHATTACHARYYA: And your question is whether to --

MR. CHAIKOVSKY: You're going to need a viewer or the software, et cetera, to actually view those yourself. I'm not sure if the hard drive -- I don't know if the hard drive -- it has the software on it? Yeah, it has the

software on it. Might not be so easy to learn to use, but it's on there.

JUDGE BHATTACHARYYA: So the same procedure. Please keep in your offices, and the exhibits list, indicate on the physical exhibits list whether -- where the physical exhibit is, so that if I want to view it, I can get in touch with you.

MR. CHAIKOVSKY: Thank you.

MS. KIM: Finally, the parties have prepared lists of exhibits that they seek to admit for days 2 through 5, and we have paper copies available, and subject to any further comments from Staff, I believe we're in agreement.

MR. SHIN: No objection from the Staff, Your Honor.

JUDGE BHATTACHARYYA: Okay.

MS. KIM: May I approach?

JUDGE BHATTACHARYYA: Yes.

I have before me four lists of exhibits. One list of exhibits is entitled Day 2 Admitted Exhibits, then we have Day 3 Admitted Exhibits, Day 4 Admitted Exhibits, and Day 5 Admitted Exhibits.

I understand there are no objections to admission of these exhibits; is that correct?

MS. KIM: That's correct, Your Honor.

MR. OU: No objection, Your Honor.

MR. SHIN: No objection, Your Honor.

JUDGE BHATTACHARYYA: And the exhibits on these lists are hereby admitted into evidence. And please provide a copy to the court reporter so that it can be entered into the transcript.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

JUDGE BHATTACHARYYA: With that, I think we have made it to the end.

I want to thank everybody, our witnesses, counsel, including our NEXT advocate for very helpful presentations.

I also want to thank our court reporter, Ms. Kinkade, and my attorney advisor, Ms. Ames, for helping out with the process.

I know it's been a long week. I hope that at least some of you coming from out of town had a chance to see the cherry blossoms at some point during the week, and I hope everyone has a good weekend.

We're adjourned.

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(Whereupon, the proceedings concluded at 6:09 p.m.)

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E X H I B I T S

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RX-0329
RX-0330
RX-0351
RX-0514
CX-0369
JX-0082
JX-0149
JX-0332
RX-0096
RX-0279C
RX-0312
RX-0313C

RX-0336

RX-0341

RX-0268C

CX-0105

CX-0111

JX-0082

JX-0084

JX-0085

JX-0087

JX-0088

JX-0089

JX-0102

JX-0115

JX-0127C

JX-0149

JX-0329

RX-0040

RX-0259

RX-0312

RX-0347

RX-0348

RX-0350

RX-0351

RPX-0001

CX-0369

JX-0082
JX-0104
JX-0130
JX-0149
RX-0312
JX-0332
RX-0341
CX-0450C
JX-0082
JX-0084
JX-0085
JX-0087
JX-0088
JX-0089
JX-0149
JX-0331
RX-0040
RX-0055
RX-0259
RX-0312
RX-0341

C E R T I F I C A T E

TITLE: IN THE MATTER OF CERTAIN PHOTOVOLTAIC CONNECTORS AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1365

HEARING DATE: March 22, 2024

LOCATION: Courtroom B

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: March 22, 2024

Signed:

ss// _____

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// _____

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// _____