In the Matter Of:

Affordable Wire Mgmt vs

Cambria County Assoc. for the Blind & Handicapped, Inc.

OMID BEIK, PH.D.

July 09, 2024



UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

IPR2024-00178, Patent 11,349.291

DEPOSITION OF OMID BEIK, VOLUME I
July 9, 2024

AFFORDABLE WIRE MANAGEMENT, LLC,

Petitioner,

vs.

CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED, INC.,

Patent Owner.

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Pursuant to Notice and the Federal Rules of Civil Procedure, the deposition of OMID BEIK, VOLUME I, called by Patent Owner, was taken on Tuesday, July 9, 2024, commencing at 9:30 a.m., at 216 16th Street, Suite 600, Denver, Colorado, before Barbara J. Davalos, Registered Merit Reporter and Certified Realtime Reporter within and for the State of Colorado.

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P R O C E E D I N G S

OMID BEIK,

being first duly sworn in the above cause, was examined and testified as follows:

EXAMINATION

BY MR. FLYNN:

Q Good morning, Dr. Beik.

A Good morning.

Q We've met right before the deposition. My name is Ed Flynn. I am counsel for the patent owner in this IPR matter, Patent Owner Cambria County Association for the Blind and Handicapped. This is -- you're here for your deposition today in IPR2024-00178 relating to U.S. Patent Number 11,349,291.

Dr. Beik, I'm going to be asking you a series of questions today regarding your knowledge of the information relating to this IPR. You've also submitted an expert declaration in this matter on behalf of the petitioner, Affordable Wire Management. I'm going to be asking you questions about your declaration today as well.

We're going to -- I'm going to do my best to make this deposition as efficient as possible. And I'm going to do my best to ask my questions as

succinctly as possible. If there is any time when you do not understand my question or you don't hear it, please feel free to ask me to repeat the question or rephrase the question and I will be happy to do so. I want to make sure that the question that I ask is the question that you're answering as well. And so I want to make sure that we're on the same page.

We're going to be here for a little while today. However efficient I try to make this, at any time if you need a break, you know, we can always take a break. The only thing I would ask you and your counsel is that if we need to take a break to -- if it's in the middle of a question or specific line of questioning if we can wait until that question or that line of questioning is finished before we take the break.

Otherwise, this is not an exercise to make you feel uncomfortable in any way today. So whatever breaks you need, please feel free to ask. Okay?

A (Nodded head.)

Q Let me ask you just some preliminary background information. I should have you state your full name for the record before I go any further.

A Omid Beik.

Q And could you spell it, please?

A O-M-I-D, B-E-I-K.

Q Okay. Dr. Beik, have you ever testified before?

A I have not.

Q Okay. Have you ever been an expert in any kind of matter before, served as an expert in any kind of litigation?

A Not in litigation.

Q Okay. Have you served any kind of -- have you served as an expert in any kind of consultant capacity?

A I have.

Q And what matters have you served as a consultant?

A I have consulted in electric power grid systems.

Q What was the nature of the consultancy?

A Technical.

Q Okay. So it wasn't in any way related to any litigation or disputes between parties; is that right?

A Correct.

Q Okay. And so when you provided your technical consultancy, was that for commercial business matters or commercial projects?

A Both commercial and nonprofit.

Q Okay. Okay. What kind of projects did you act as a consultant for?

A Generally related to electric power systems, components, modeling, control, design.

Q When you say "electric power systems," what all does that encompass? Well, specifically, what were the electric power systems that were involved in your consultancies?

A Electric power generation, renewables, electric power transmission, distribution.

Q Is transmission and distribution the same thing?

A In electric power system we separate transmission from distribution systems.

Q What's the difference?

A In technical terms, we refer to voltages uses usually above 69 kilovolt as transmission grid.

Q 69 did you say? 69 kilovolt?

A That is in the United States.

Q Okay.

A And it's -- some may say more than 34.5 kilovolt.

Q Okay. Whether it's 34.5 or whether it's 69, anything over that threshold is referred to as

distribution?

A Below that threshold.

Q Below that threshold. I'm sorry.

And then above that threshold, it would be transmission? Did I just say that right? Yeah. Above that threshold it would be considered to be transmission; is that correct?

A That is correct. Up to the generation, though. The generation voltages are lower.

Q I'm not sure I understand that. Can you explain that for me, please.

A The electric power generation takes place at lower voltages, traditionally from 6 kilovolt to 13.8 kilovolt.

Q Okay. On your consultancy projects, what specific kinds of electric power systems have you consulted on?

A Both conventional generation and systems and renewables.

Q Of the conventional, what types of power systems, specific types of power systems? Are there different kinds of power systems within conventional?

MR. DIXON: Objection to form.

Q (BY MR. FLYNN) Let me just re-ask it again. It was a little bit awkward.

Are there different types of power systems within the conventional power systems category?

A I'm not sure if I understand your question.

Q What is convention -- when you say "conventional," what do you mean by that? What is that referring to?

A It usually refers to non-renewables.

Q Okay. Coal, for example, would that be conventional?

A That's one type.

Q Okay. What are other types of conventional that are nonrenewables?

A Gas turbine generation-based system, nuclear-based systems, some may consider hydro as conventional as well.

Q Okay. And then in the renewable category, what different types of systems are in the renewable category?

A Some of the main ones are wind and solar combined with battery energy storage systems.

Q I'm sorry I missed that last part.

A Combined with battery energy storage systems.

Q So of the projects that you have consulted

on, about how many projects are we talking about that you've consulted on technically?

A I cannot remember.

Q More or less than ten?

A I cannot remember.

Q Do you have any general estimate in terms of any break point of the number of projects that you've consulted on?

A I don't remember.

Q Of the renewable projects, have there been any type of renewable project that you have consulted on more than others?

A I'm not sure if I understand your question.

Q I don't think I asked it very well to have you understand it.

You've mentioned, in the renewable category, wind, solar and combined with battery storage; is that correct?

A That is correct.

Q Okay. Have you consulted on wind projects more than solar projects?

A I don't remember. I can't say.

Q Have you ever consulted on a solar project?

A What do you mean by "solar project"?

Q Well, of the projects that you've consulted on that -- in the renewable category, solar being one of those kinds of projects within renewable, can you tell me whether you have provided technical consultation on any type of solar project?

A I need more information because that solar power generation, it's at the plant. Is it transferring the solar power? Is it rooftop solar power? I need further information.

Q Have you provided technical consultancy on any project having to do -- deal with the solar plant?

A I have not.

Q How about have you consulted on any project relating to solar power generation?

A I have.

Q How many projects have you consulted on relating to solar power generation?

A I don't remember the number.

Q Has it been more than one at least?

A It has been more than one.

Q Okay. When you say solar power generation, so that I'm sure that I understand what you're saying, what does solar power generation

include? What kind of project would solar power generation be?

A Broadly speaking, that's generation of power from solar panels.

Q Does it focus on any particular stage of the generation?

A I'm not sure if I understand your question.

Q Power generated from solar off of the solar panels is DC current, correct?

A Usually.

Q And am I correct that the DC current ultimately needs to be converted to AC current?

A I don't agree with that statement.

Q In order for the DC current that comes off the solar panel to be able to reach the grid, the power grid, does the DC need to be converted to AC?

A Not necessarily.

Q You said you have never consulted on a project related to solar plants, correct?

A That is correct.

Q And a solar plant would be an installation where there are multiple solar panels or groups of solar panels, and from those solar panels DC collectors collect the DC current and ultimately go

to an inverter where the DC is inverted to AC; is that correct?

A That's one common practice.

Q In that practice have you -- have any of the projects that you've consulted on involved that aspect that I just described?

A The projects was not -- have not been on plant but they involved collecting power from solar panels to an inverter and converting it to AC.

Q Okay. So if it wasn't plant, what was it?

A Rooftop solar.

Q Okay. Was that residential?

A Institutional.

Q So however many projects that you have consulted on that have dealt with solar, have they all been rooftop applications?

A For power -- solar power generation, yes.

Q Okay. Is there something other than solar power generation that you have consulted on with respect to solar?

A Transmission of power from solar power to other places.

Q Could you give me an example, please, of what those projects were that you consulted on?

A A transmission grid that would collect the

power, not only from the solar, for a combination of generations and send it from Point A to Point B.

Q So Point A starts out at the grid?

A At the collection substation in this example.

Q Okay. Thank you.

Are there any other types of projects other than what you've just described to me that you've consulted on relating to solar?

A I have designed solar power systems as part of my research.

Q What kind of solar power system have you designed as part of your research?

A The latest one is 26-megawatt Borrego Springs Microgrid in California.

Q What was the name of the --

A I don't know the spelling, neither the pronunciation I'm not sure. But it's referred to as Borrego Springs Microgrid.

Q And that was in California, did you say?

A The microgrid is in California.

Q So what is a microgrid?

A It's smaller-scaled grid.

Q Smaller than what?

A The national U.S. grid.

Q Are the microgrids operated by utilities?

A I can't say. I don't know.

Q Was the microgrid in Borrego Springs, if I'm saying it correctly, was that operated by utility?

A I believe it is a utility-operated microgrid.

Q So what was specifically your role -- I think you said that you researched the design of that or your research included the design of that microgrid? Did I get that correctly?

A The microgrid is in operation and has been designed. We took that and redesigned it as part of our research.

Q What was the nature of the redesign? What did you redesign?

A We have published several papers on that. I will -- generally speaking about we designed and controlled mainly the solar plant, which is a 26-megawatt, and that connection -- and its connection to the substation into the grid.

Q Did you design -- I'm sorry, this was part of your research, did you say?

A Part of my group's research.

Q And what group was that?

A E Power Hops.

Q When was that?

A It started 2021, November/December area, and it is continuing.

Q So when you say that you redesigned the connection of the substation to the grid -- is that what you said?

A Solar power plant to the substation and substation to the grid.

Q So what components of that did you redesign?

A Generally speaking, we designed the solar panel with a controller to be more efficient. We developed an inverter that's more efficient. And we developed a new control system for the inverter. The power flow, the voltage drops, so on and so forth.

Q Did any part of the redesign on that project have anything to do with cable management or wire management?

A Our research is advancing the state of the art. Cable management and wire management are common known matters in power systems and solar power.

Q But my question to you was, did your redesign in any way relate to cable management or wire management on this project?

A Can you explain what you mean by "wire management" or "cable management"?

Q Well, you used the term yourself. What did you mean by it? When you said that "Cable management and wire management are common known matters in power systems and solar power," what were you referring to as cable management and wire management?

MR. DIXON: Objection. Form.

Q (BY MR. FLYNN) You can answer.

A Connection, separation, delivery of different types, AC/DC cables from a solar panel, as an example, to a point of connection; for example, an inverter.

Q So did you redesign, as part of your research, any part of that cable management or wire management on that project as you've just described it?

A We have not --

Q Thank you.

A -- so far.

Q I want to make sure that I understood your prior answer before about your testimonial experience.

Is it correct that other than in this IPR

proceeding that we're here today about, you have not testified in any other type of litigation or court proceeding?

A Correct.

Q Okay. And when I say "testified," that includes not just testifying in person like we're doing today but submitting any kind of affidavits or declarations.

A I have never submitted affidavit, declaration, being deposed or being part of any litigation --

Q Thank you.

A -- regarding to patents.

Q Thank you.

What is your -- what rate are you being compensated for in this proceeding?

A I need to refer to my document. I don't remember.

Q When you say your document, are you referring to your declaration?

A Correct.

Q Okay. Your declaration, which I have put in front of you already and it has been previously marked as Exhibit 1002 in this proceeding, 1002, that declaration I believe indicated at the time that you

submitted it that your compensation rate was $225 an hour.

Does that sound correct to you?

A That is correct.

Q Is that the same compensation/hourly rate that you have received as a consultant on the technical projects that you've discussed?

A I don't remember the rates for those projects.

Q Do you know whether the rate that you're getting paid for this IPR proceeding is higher than your consultancy rates on those other projects?

A I don't remember.

Q Other than serving as an expert on behalf of Affordable Wire Management -- and I'm going to refer to Affordable Wire Management today as "AWM." Okay? And if I refer to Cambria Association for the Blind and Handicapped any further today I will refer to them as "CAP."

Other than serving as AWM's expert in this IPR proceeding, have you ever had any other relationship with AWM?

A I have not.

Q Have you ever had any relationship with any of the principals of AWM?

A I have not.
Q Do you know who the principals of AWM are?
A I do not know.
Q Are you familiar with the name of Scott Rand?
A I am not.
Q Are you familiar with the name of Daniel Smith?
A I am not.
Q Other than in this IPR proceeding -- and we're going to be talking on Thursday about a separate IPR proceeding. But other than these IPR proceedings, have you had any other relationship with the Mintz law firm?
A I have not.
Q Can you tell me, please, Dr. Beik, what you have done to prepare for your deposition today?
A What do you mean?
Q Did you review materials to prepare for the testimony that you were going to be giving today in your deposition?
A I have reviewed materials.
Q Okay. I assume -- I don't want you to tell me anything that you and your counsel may have spoken about, but I assume that you have met with

your counsel to prepare for the deposition; is that correct?

A That is correct.

Q Okay. So other than meeting with your counsel and reviewing certain materials, have you done anything else to prepare for your deposition testimony today?

A I have read the patent, prosecution history, some of the exhibits.

Q So anything that you have reviewed in preparation for your deposition testimony today have been documents relating specifically to the IPR and that are part of this IPR proceeding; is that right?

A Sorry, I did not understand the question.

Q Any of the materials that you reviewed to prepare for your deposition today have been the patent, some of the exhibits and anything else that is already part of the IPR record; is that true?

MR. DIXON: I'll caution the witness not to reveal any privileged information. But to the extent that you can answer, please answer.

A I have reviewed the material that is part of this IPR.

Q (BY MR. FLYNN) Okay. At the back of your declaration there is an Appendix B, I think. If you

would take a look at that. And it is a list of materials from the IPR proceeding, and that is Appendix B to your declaration that you submitted; is that right?

A Correct.

Q And is that Appendix B a list of the materials that you reviewed in connection with the preparation of your declaration?

A Correct.

Q Are they the same materials that you reviewed in preparation for your deposition today?

A Correct.

Q Did you review all of those materials on Appendix B in preparation for your deposition today?

A I have looked at these materials.

Q So some you have reviewed in more depth than others. Is that what you're saying?

A That's a fair statement.

Q Which ones -- strike that.

Dr. Beik, you have -- attached to your declaration as Appendix A is your CV, your curriculum vitae, correct?

A Correct.

Q And this declaration was prepared -- well, it's dated November 10, 2023, correct? The

declaration itself.

A Whatever it's date --

Q Look at the last page of it.

A -- dated, that's the date. I don't recall the dates. That's the date that it's dated.

Q I assume that your CV that is attached to your declaration as Appendix A was current as of that time; is that right?

A What do you mean by "current"?

Q It was the most currently updated CV that you had?

A It was my CV at that time but did not include every single detail of my background and history.

Q Right. Have you updated your CV since November 10, 2023, at the time of this declaration?

A I don't remember. I may have.

Q What is your current position, sir?

A I am a faculty member with Colorado School of Mines.

Q And in what department?

A Electrical engineering.

Q And what specifically is your position, when you say "faculty member"?

A Assistant professor.

Q I obviously have your CV in front of me. So I'm going to try to shortcut as much as I can and go through some of your CV. But according to your CV, you have been an assistant professor at Colorado School of Mines since October 2021 and to the present; is that right?

A Can you read that again?

Q Actually, I will because I made a mistake in my question.

Your CV indicates that you have been an assistant professor at Colorado School of Mines from August 2023 to the present; is that right?

A That is correct.

Q And prior to August of 2023, you were an assistant professor at North Dakota State University in the department of electrical and computer engineering; is that right?

A That is correct.

Q All right. Prior to when you became -- strike that.

Your education -- it looks like your primary medication -- education was in Iran up through 2009; is that right?

MR. DIXON: Objection to form.

A (Nodded head.)

Q (BY MR. FLYNN) On your CV it indicates that from 2003 to July 2007, the degree is B, period, SC, period.

What does that stand for?

A It's the same as we call BS in the U.S.

Q Bachelor of science?

A Correct.

Q Okay. And then you -- and that was -- am I saying this correctly, Yazd University?

A That is correct.

Q Okay. And then you also attended -- attended Yazd University in Iran to earn your Master's in Science in 2009; is that right?

A Can you read that again?

Q From September 2007 to October 2009, in October 2009 you earned your Master's of Science; is that right? Is that what MSC is?

A Correct.

Q Okay. And that was also -- and that was at not Yazd University. That was -- could you say it for me, please. I don't want to mispronounce it?

A Shahid Beheshti University, Abosvol School of Engineering.

Q Okay. Thank you. And then you earned your Ph.D. in Manchester in United Kingdom; is that

right?

A Can you read that again?

Q You earned your Ph.D. in December 2012 at the University of Manchester in the United Kingdom; is that right?

A That is not correct.

Q You were a Ph.D. student from 2011 through 2016 and then you earned your Ph.D. in 2016. All right. Let me start over.

You were student, a Ph.D. student, from September 2011 to December 2012 at the University of Manchester in the United Kingdom, correct?

A Correct.

Q And then you earned your Ph.D. but you earned your Ph.D. from McMaster University in Ontario, Canada?

A That is correct.

Q And that was in 2016?

A (Nodded head.)

Q And then you also -- from 2016 to 2017, you were doing a postdoctoral research fellow at McMaster University in Ontario, Canada as well, correct?

A That is correct.

Q Following the completion of your

fellowship, you had a few employment positions from 2017 through September 2021 all in Ontario, Canada; is that right?

A Can you read that again?

Q From 2017 to 2018, according to your CV, you were a senior engineer at Magna Powertrain, Inc., in Ontario, Canada today, correct?

A Correct.

Q And what was Magna Powertrain, Inc.? What did do you at Magna Powertrain, Inc.?

A I was a senior engineer, and Magna Powertrain is an automotive company electrified.

Q What type of work did do you as a senior engineer at Magna Powertrain?

A Mostly research and development.

Q And it was all in the automotive industry and transmissions industry; is that correct?

MR. DIXON: Objection to form.

Q (BY MR. FLYNN) You can answer.

A That is not correct.

Q Okay. Could you correct me, please.

A I worked on developing power systems and power electronics as part of electrified systems within automotive.

Q Okay. From June 2018 through April 2019,

you were the lead R&D engineer at Mirus International; is that right?

A Correct.

Q And what was Mirus International involved with?

A Mostly distribution power grid.

Q Could you be more specific, please.

A Mirus provides a range of power filters for power distribution systems, but it's not only that. There are a number of other activities that Mirus does.

Q Like what?

A They design substations, electrical panels. They develop controllers for inverters, for variable frequency drives and so on.

Q Does Mirus still exist?

A I have not checked.

Q Okay. Does Mirus provide any types of products or services relating to the solar industry?

A I don't know.

Q At your time there as lead R&D engineer, were you involved with any products or services that were provided to the solar industry?

A I am not sure it were solar or not.

Q What did you do as lead R&D engineer?

A Developed electrical power filters for distribution systems.

Q Could you tell me what electric power filters are?

A They -- generally speaking, they remove harmonics unwanted harmonics from distribution grids, transmission grids, generation, end users and so on.

Q What do you mean when you say "harmonics"? What does that refer to?

A Unwanted components in voltage and current.

Q And after you left Mirus in April 2019, you then became employed in March 2020 as a senior R&D manager at -- is it Forte Mobility; is that right?

A Correct.

Q So there was a year gap between when you were at Mirus and when you started at forte between April 2019 and March 2020. What did you do during that time?

A During some of these time and still today, I'm an adjunct professor with McMaster University in Canada. I did research and limited teaching.

Q What was your research directed to?

A Electrical power systems as a whole.

Q I assume the courses that you taught also related to electrical power systems?
A In one way or another.
Q Did that include solar?
A Solar is a part of. One of our course that I teach is called power systems.
Q And solar is part of that course? Is that what you're saying?
A That is correct.
Q You said that they teach. Did you teach that course?
A I taught.
Q Okay. And what did your -- what did that course -- what aspect of solar did that course focus on?
A Generation, control, power electronics and so on.
Q Okay. Power electronics and solar primarily relate to inverters?
A Not necessarily.
Q When you were teaching and researching power electronics, did you focus on the inverters aspect?
A That was one of our focus.
Q What other -- and I'm specifically talking

about solar now. With respect to solar, what other aspects did you focus on in the category of power electronics?

A The DC to DC converters.

Q Did you say AC to DC converters?

A DC to --

Q DC to AC converters?

A DC to DC converters.

Q DC to DC, I'm sorry.

A Inverters, maximum power point tracking and pulse with modulation, stability, voltage control, current control and so on.

Q Okay. At Forte, what did you do?

A A senior R&D manager.

Q And what was Forte Mobility directed to?

A One of their products was developing an electric van.

Q I'm sorry, electric van?

A (Nodded head.)

Q Is that the project that you were involved with when you were at forte?

A There were two main areas that I focused on. It was an electric power train, which is developing an electric power system for an electric van as well as a battery energy storage system.

Q For the electric van?

A That -- battery energy storage system was not specifically for van. Van was one application of it.

Q What other types of applications?

A Grid applications, aerospace applications, heavy-duty machinery applications and so on.

Q Okay. And your CV also indicates that from June 2019 to September 2021, that you were a founder and director of -- is it Enercs, Inc.?

A That is correct.

Q And what is or was Enercs, Inc.?

A It was an early-stage startup.

Q What did in Enercs focus on?

A Early-stage products for renewable power systems, electrification industry as a whole.

Q What type of products?

A Power grid related, such as power electronics, filters, controllers, inverters and so on, one line of product.

Q Were there other lines of products within solar or related to solar?

A We did some research and work on solar cells itself.

Q Okay. So you started Enercs?

A I founded Enercs.
Q Were there others involved in the establishment of Enercs?
A I was the only founder and director.
Q Did you have others working with you?
A I did.
Q How many other people did you have working with you?
A I can't recall the exact number. We had on-and-off, part-time people that they worked.
Q This was also located in Ontario, Canada, correct?
A That is correct.
Q Does Enercs still exist?
A I dissolved it.
Q When did you dissolve it?
A I don't recall the exact time, but was right before I joined North Dakota State University. Perhaps September of 2021, around that time.
Q Why did you dissolve it?
A I was moving to a new academic position.
Q Other than Enercs and Forte and Mirus and Magna that are listed on your CV, have you ever been involved in any other employment ventures, private employment ventures following your completion of your

postdoctoral fellowship?

A I'm not sure if I understand your question. Like employed by?

Q Is there anything else that's not on your CV that you did between April 2017 and the present?

MR. DIXON: Objection to form.

Q (BY MR. FLYNN) From an employment-related aspect. Did you have any other employment positions other than what's listed on your CV?

A No full-time employment.

Q Did you have part-time employment?

A I had contracts and sometimes those were -- I had to spend time in the facilities of those companies.

Q What kinds of contracts and companies were they?

A Power grid, automotive electrification.

Q The same kind of things that you've already talked to me about for those other positions; is that right?

A Correct.

Q At North Dakota State University, what kinds of courses did you teach?

A Power systems, power electronics --

Q Did --

A -- mainly.
Q I'm sorry.
A Mainly.
Q "Mainly," is that what you said?
A (Nodded head.)
Q Did you teach any course focused on solar at all?
A Power systems.
Q What about power systems focused on solar?
A Parts of our power system course discusses solar power systems, generations, controls, power electronics.
Q Again, the same kind of areas that you've described with respect to your employment positions; is that right?
A That is correct.
Q Okay. You were at North -- you were at North Dakota State University from October '21 to July 2023, and at that point you then moved to the Colorado School of Mines in August of 2023; is that right?
A That is correct.
Q And what kind of courses do you teach at Colorado School of Mines?
A As an early career tenure track, I'm

mostly focused on research. I only teach one course, which is power electronics.

Q Okay. And specifically power electronics in what application?

A Renewables.

Q Can you be more specific?

A Wind, solar, battery energy storage, electric vehicles, electrified aerospace, spacecrafts.

Q And what is the one course that you teach?

A Intro to power electronics and -- intro to high power electronics, excuse me, and advanced high power electronics.

Q Dr. Beik, you -- your CV indicates that you have also coauthored some books, right? If you look at the second page of your CV.

A I have.

Q And there are four books that are identified there; is that right?

A That is correct.

Q Is it correct that only one of those books relates specifically to solar power systems, which is the second book identified there?

A That is not correct.

Q Okay. That's the only book, the Wind and

Solar Power Systems: Design, Analysis and Operation, that's the only title of those four books that includes the word "solar." That's why I asked you that.

So how do any or all of the other three books relate to solar?

A Spacecraft Power Systems, there are a number of chapters dedicated to solar power systems.

Q For the operation of spacecraft?

A In space.

Q What about the Multiphase Hybrid Electric Machines: Applications for Electrified Powertrains, does that have anything to do with solar?

A That does not, sir.

Q Okay. And how about the last book, DC Wind Generation Systems: Design, Analysis and Multiphase Turbine Technology, does that relate to solar?

A It relates to the extent that the discussions on power electronics, controls and power systems are very much applicable to the solar power systems.

Q But the focus of the book is on wind generation systems; is that correct?

A That is correct.

Q I did you the honor of purchasing the book.

A I'll sign it at the end.

Q You are listed as a coauthor on the Wind and Solar Power Systems book, Third Edition; is that right?

A That is correct.

Q And you are listed along with -- is it Dr. Patel?

A That is correct.

Q Mukund, I don't know if that's how you say it? Mukund?

A Mukund Patel.

Q Okay. M-U-K-U-N-D.

You were not a coauthor of the first two editions of this book; is that right?

A That is correct.

Q Okay. And if I remember correctly this third edition was in 2021; is that right?

A I believe that is correct.

Q Do you know specifically what portions of the book you contributed to?

A I can't recall exact.

Q Generally speaking?

A I redid the previous version.

Q I'm sorry, you what?

A I took the previous version, updated all the chapters, added a few chapters.

Q Do you know what chapters you added?

A Thank you. Updated chapters include 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21.

Q So those were all chapters that you updated; is that right?

A New chapters include 7, 8, 9; however, those chapters that I updated include entire new sections that has been rewritten.

As an example Chapter 14, Section 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8, 14.9 have -- are new editions. Chapter --

Q You mean they're new editions to Chapter 14 that weren't in the prior editions; is that correct?

A That is my statement.

Q Okay.

A Chapter 3, 3.5, 3.6 new editions. Chapter 2, 2.2, new edition. Chapter 4 is updates. Chapter 5, 5.1, new edition. New edition within the section. The section title is the same. 5.5 is a totally new one. 5.7 is a new section.

I can go through all if you wish.

Q That's okay. Thank you.

MR. DIXON: Mr. Flynn, do we want to mark that as an exhibit, or how do you want to handle it?

MR. FLYNN: We should. But give me one second. I will. I'm going to ask Dr. Beik a few more questions.

Q (BY MR. FLYNN) Dr. Beik, you indicated that new chapters include 7, 8 and 9, meaning you added those chapters to the third edition of this book; is that right?

A That is correct.

Q And they were not there before?

A Not that I can recall.

Q Chapter 7, 8 and 9, all three relate to wind farms or wind systems, correct?

A That is correct.

Q Okay. And you've mentioned that in Chapter 14 you -- the updates that you did to that chapter included brand-new sections to Chapter 14, including 14.2 through 14.9.

A The upgrades are not limited to that chapter. So in --

Q Just the new material?

A The new material in almost every chapter

includes new material, every single chapter, every single section.

Q Yeah. You had just indicated that --

A That was an example.

Q Okay.

A On Chapter 14, as an example --

Q Yeah, yeah.

A -- I stated that these new sections have been added.

Q Yes.

A That was one example of all the chapters.

Q No. I understand. That's all I'm asking you about, though, is the updated new edition -- or new material in Chapter 14.

A Uh-huh.

Q And all of those new sections in Chapter 14 have to do with power electronics; is that right?

A In that chapter.

Q In that chapter?

A (Nodded head.)

Q I'm going to hand this back to you, if I can, and ask you to focus on the chapters that are within Part B entitled Photovoltaic Systems and ask you if you can identify for me what specific, first

of all, new matter that you added to any sections of any of those chapters within Part B.

A Discussions on 10.1, Figure 10.2, and those related discussions are new, 10 point -- Figure 10.3 and the discussion. Sections 10.1 to 10.2.7 have been updated but existing from previous.

Q In those sections, 10.1 to 10.7, what do the updates consist of?

A I will give you an example. The price of the PV module in Graph 10.12 have been updated from 1977 all the way to Year 2020.

Q Okay.

A That's an example.

Q Thank you.

A Chapter 11, Equivalent Circuit of the Solar Power System, has been updated.

Open Circuit and Short-Circuit Current Discussions have been updated.

IV and PV Curves have been updated.

10 point -- 11.6 to 11 point -- 11.6.1 to 11.6.6 have been updated. 11.6.6 is fairly new material.

Q I'm sorry, what -- 11.6 you said is fairly new material?

A 11.6.1 to 11.6.6 have been updated.

11.6.6 is fairly, very new material.

Q Okay.

A But it is the same title as the previous version. Sun Tracking has been updated, 11.6.7.

Q And just to make it perhaps a little bit more -- move it along a little bit, if you could just focus on, for me, identify the actual new material that you added as opposed to just the updates?

A It would be a very difficult. For instance, I'll give you the first sentence: More energy is collected by the end of the day if the PV module is installed on a tracker.

Half of the sentence is new.

Q Okay.

A So three bullet -- two bullet points under that, they have been updated. It would be a very challenging for a whatever, 200-page -- 300-page book for me to do this.

Q I understand.

So can you tell me if there are -- can you identify for me any sections or subsections or chapters in their entirety that you added that were not already in the book?

A In this chapter that you pointed out or in general?

Q In the chapters that I pointed out. So, again, I'm not asking for new material in an update. I mean that you actually wrote an additional subsection that wasn't in the book before or an additional chapter that wasn't in the book before.

A It may have previously been with the same title but -- that's what I do not remember, but the section is entirely new. 12.2.1, the title may be the same as the previous version. Do you have the previous version to this?

Q I do not.

A Then I do not remember.

Q That's all right. But the text is new?

A This is -- the text is new.

Q Okay.

A Is that sufficient or do you want me to keep going?

Q I'm interested in what entirely new sections that you've added to the book within the Photovoltaic Power Systems?

A So the Photovoltaic System, it has one section but it also has the system integration includes the photovoltaic as well. So Part B, so you will have System Integration, Part C, as well. Like Chapter 15 --

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Q Was there anything more in Part B, though, then, that was entirely new other than 12 point -- did you say 2.1 or 6.1?

You said 12.2.1?

A 12.2.1.

Q Yes. So within Part B was there anything else that you added that was entirely new, an entirely new section?

A I have added -- the section titles may have been the same, but I have added entirely new conversation, discussion and analysis.

Q That's what I'm interested in. I don't care if the titles of subsections --

A I don't know -- I don't remember if the titles of the sections we kept it or we changed it. This is too -- this book was written a few years ago. It was published in 2021, but it took us two, two and a half years to write it. I do not remember the exact details.

But the sections may -- what do you call a new section? Is it a section with a new title and text or no? The title is the same but entirely analysis is different.

Q Entirely new text?

A So this is what I don't remember. Much of

this has been updated.

Q Okay.

A I would need the previous version to compare apple to apple.

Q Okay. Is it fair to say that to the extent that there is a difference between that edition and the second edition, that any differences would be attributed to you?

A I will leave that to Dr. Patel to answer.

Q Whether it would be attributed to you or to Dr. Patel, are you the one that did anything that is different in the third edition from the second edition?

A Absolutely.

Q Okay. Yes. We're going to mark this as Exhibit 2005.

MR. DIXON: That already has an exhibit number, so this is already 1002. I think you put a 2005 sticker on it? We should probably go off the record for this.

MR. FLYNN: Yes, let's go off the record.

(Exhibit Number 2005 was marked.)

Q (BY MR. FLYNN) Dr. Beik, have you had any field experience in utility scale solar installations?

A I have not.

Q How much familiarity do you have with the National Electrical Code, the NEC?

A Can you be more specific?

Q To what degree in -- have you had to review or analyze or rely upon portions of the NEC in your work?

A We refer to it when we need it.

Q Dr. Beik, would you turn, please, to Paragraph 51 of your declaration. It's on Page 26. Paragraph 51 -- in Paragraph 51 that -- strike that.

You state in Paragraph 51 of your declaration that A person of ordinary skill in the art relating to the '291 patent at the relevant time would have had a bachelor's degree in a pertinent discipline such as electrical engineering, civil engineering, mechanical engineering or equivalent with two to three years of experience in electrical power systems, planning and design with the understanding that the number of years of experience could be higher or lower given the level of education and vice versa.

Do you see that?

A Yes.

Q Okay. And is that what you believe the --

the level of skill of a person of ordinary skill in the art is with respect to the '291 patent?

A Yes.

Q Have you in your answers today explained to me all of the experience that you have had in electrical power systems planning and design?

A Not all.

Q What other experience have you had in electrical power systems planning and design that you haven't already disclosed today?

A Prior to 2000, prior to my experience in Canada, in my master's degree I worked for a company in Iran. It's called Nulgostar (phonetic). They work in distribution systems. I was a part-time engineer.

Q Did you work in planning and designing of those systems?

A It was planning, design, operation and installation.

Q Did they have anything to do with solar?

A I don't know. We -- the part that we worked was field experience as well, taken from the substation downwards, not upwards.

Q Do you believe that you possess the level of skill that is described in Paragraph 51 of your

declaration?

A I do.

Q Have you ever heard of or are you familiar with the name Bill Brooks, William Brooks?

A I have not. I'm not familiar with that name.

Q Have you heard of Mr. Brooks' name in the context of this litigation at all?

A I have not.

Q Have you ever heard the name or are familiar with the name Edward Kern, K-E-R-N?

A I have as part of this IPR.

Q And what's your familiarity with Dr. Kern as part of this IPR?

A I believe he was -- I looked at his declaration as an expert.

Q Other than Dr. Kern's declaration that he has submitted in this litigation, have you ever read any other writings or publications from Dr. Kern?

A I did not know Dr. Kern nor I heard of him or read about anything that he authored, coauthored or published prior to this.

Q Are you familiar at all with his level of experience in the solar industry?

A Not prior to this.

Q Do you recall having read any articles or papers or other writings from Mr. Brooks?

A No.

Q Including as part of this litigation?

A The name doesn't ring any bell. Even if I have read that he has something in this, I don't know.

Q Doing okay?

A Yeah.

Q Dr. Beik, I've just put in front of you what has previously been marked as Exhibit 1001 in this IPR matter, which is U.S. Patent 11,349,291.

You have reviewed this patent, have you not?

A I have looked at it.

Q When you say you have looked at it, have you reviewed every page of the '291 patent?

A I can't recall every single page, but I have reviewed this and looked at it in detail.

Q If you would turn to where the specifications start, please.

A Which page?

Q That begins with Column 1. Yeah. From Column 1 of the specification to the end of the patent through the claims, have you reviewed every

page of that portion of the patent?

A I don't recall right now. I have reviewed this document.

Q I understand that you're saying you reviewed this document. But do I also understand that you're saying you don't recall if you have reviewed every page of the portion that I just identified?

A I do not remember that.

Q The '291 patent was issued on May 31, 2022, correct?

A That's what it states.

Q By the way, I meant to ask you and I forgot. Do you have any patents?

A Yes, I do.

Q How many patents do you have?

A Referring to Page 94 of my declaration, Electric Powered Landing Gear System, granted. Electrified Landing Gear Adaptor, granted. Electric Power Landing Gear System, European patent application granted. Electric Power Landing Gear System, Canadian patent, we received a notification of the grant.

And we filed two invention disclosures with North Dakota State University and two invention

disclosures with Colorado School of Mines further than this. I do not know their status right now. I know one of them has been patented provisionally.

Q So the four patents listed on your CV all have to do with electric-powered landing gear systems, correct?

A That is correct.

Q And those other invention disclosures that you have submitted as part of North Dakota State University, were they also relating to electric powered landing gear systems?

A (Shook head.)

Q What were they relating to?

A They were related generally in power electronic systems and power systems.

Q Okay. Thank you.

All right. Back to the '291 patent. What's your understanding of the priority date of the '291 patent?

A It states here November 29th, 2014.

Q And what is that date, November 29, 2014? What does that relate to?

A It's what you said. It's the priority date.

Q And what do you understand the priority

date to be?

A First that this was filed or a version of this was filed.

Q So looking at the cover page of the '291 patent, your understanding is that the priority date of November 29, 2014, was the date that the application was filed that ultimately resulted in the issuance of the U.S. Patent Number 9,722,405, correct?

A Sorry, can you -- that number, can you say it again?

Q Yes. You understand that November 29, 2014, was the date that the application was filed, the application that resulted in the issuance of U.S. Patent Number 9,722,405?

MR. DIXON: Objection to form.

A I don't understand your question, sir.

Q (BY MR. FLYNN) Okay. But understand that November 29, 2014, is the priority date of the '291 patent?

A That's what it states here. And I'm going based on what it states here.

Q Okay. Do you understand that the application that was filed on June 16, 2021, that resulted in the issuance of the '291 patent is a

continuation of various patents that date back to -- patent applications that date back to November 29, 2014?

A I can't see the date here that you referred to.

Q See where it says June 16, 2021, where it says Filed? It's the Number 22 in the parenthesis.

A Can you refer to me where exactly it is?

Q Sure.

A Can you mark it on this, please?

Q I'm not going to mark it. I'll just point it to you. Right there.

A Yes.

Q Okay. And under the heading Related U.S. Application Data, do you see that? Slightly below that June --

A Yeah.

Q Okay. Do you understand what that data is, what that's referring to?

A It's referred to the history of this patent.

Q You understand that between -- that the application that was filed on June 16, 2021, that resulted in the issuance of the '291 patent relates to the various applications and patents that are

identified in the Related U.S. Application Data section, correct?

A Correct. It states Continuation.

Q Yes, okay.

A I'm assuming that means it is related to this.

Q And do you understand, then, that the specification, including not just Column 1 of the specification up to the claims but also the drawings and figures, are the same for each of those applications in that history? Do you understand that?

A I don't know.

Q Okay. Have you looked at any of the related applications or patents that are in that section, Related U.S. Application Data?

A I can't recall.

Q Did you -- can you recall whether you specifically reviewed U.S. Patent Number 9,722,405?

A I cannot recall.

Q Can you -- do you know -- strike that.

Do you know whether the figures and drawings and specification of the '291 patent are the same as the figures and drawings and specification of U.S. Patent 9,722,405?

A Drawings and specifications are -- in this are the same as that?

Q That's what I'm asking.

A I do not know.

Q If you would look at Paragraph 39, please, of your declaration.

In Paragraph 39 of your declaration the second sentence, you state, The '291 patent is directed to, quote, a locking cable hanger and multiple cable carrier -- carriers or saddles on one hanger, which can be used in the solar, mining and electrical industries. Correct?

A That's what it states.

Q And you cite to the '291 patent, Exhibit 1001, at Column 1, Lines 18 to 19, correct?

A That's what it states.

Q And what Column 1, Lines 18 to 19 actually say in the '291 patent is that these -- This invention has to do with a locking cable hanger system.

Do you see that?

A I agree with this.

Q And in Paragraph 39 of your declaration, the portion of that second sentence that I read to you that is in quotes, a locking cable hanger and

multiple cable carriers or saddles on one hanger, that's not what it says in Columns 18 and 19, is it? Column 1, Lines 18 and 19.

A The first portion of it is the same. The second portion of it is not.

Q What portion of it is the same?

A A locking cable hanger.

Q Doesn't Lines 18 and 19 actually refer to a locking cable hanger system?

A From the system onward, it is not the same.

Q In other words, your declaration doesn't contain, from Lines 18 to 19, from "the system" onward; is that right?

A Some of it, it does not. If you continue, some of it, it does.

Q And what you have in quotes in Paragraph 39 doesn't match up with Column 1, Lines 18 and 19 of the '291 specification, correct?

A Some of it, it does not.

Q Would you agree that when Column 1, Lines 18 and 19 refer to a locking cable hanger system, that the invention has to do with more than just the cable hangers themselves?

A I'm not sure what you're referring to.

Q Would you like me to repeat the question?
A I would like you to tell me more details because when I read the abstract --
Q I'm not asking you about the abstract. I'm asking you about Column 1, Lines 18 to 19.
And what I'm asking you is that when the Column 1, Line 18 to 19 refers to a locking cable hanger system, that system means and includes more than just the hangers. Do you agree with that?
A I don't know what the definition of "system" in that sentence is, sir.
(Reporter clarification.)
A The definition is of "system" in that sentence. I read the whole patent. I don't focus on that sentence.
Q (BY MR. FLYNN) So by reading the whole patent, do you understand that the word "system," as used in the specification, includes more than just the hangers themselves?
A It may refer to it. I will look at it in detail to see what that system is specified as.
Q Well, you've already looked at this patent, haven't you?
A Okay.
Q You reviewed this patent to do your

declaration that you've submitted in this case, have you not?

A I have.

Q And from your review of this patent that you did in preparation of your declaration, don't you already have an understanding of what the system that's referred to in the '291 patent is?

A You can characterize it however you wish. I know what my understanding is.

Q And that's all I'm asking you for, sir, is your understanding. Do you under --

A My understanding is a cable hanger for solar, mining, electrical industry for use in supporting a plurality of conductive cables from a messenger wire.

That's my understanding, sir.

Q And so all that you just read -- and you just read from the abstract, correct?

A That is correct.

Q Then from your understanding of what -- how you read the abstract, do you understand that the system of the '291 patent is more than just hangers?

A What else is there?

Q I'm asking you if you understand if there's more to the system than just hangers?

A I understand that it's a hanger hanging from a messenger wire. That's what I understand. If the system, that's what you're referring to -- if by "system" you're referring to other components that I'm not familiar, I don't know what you're talking about.

Q And do you understand what the purpose of the system of hangers hanging from a messenger wire is in the '291 patent?

A Can you repeat the question? Sorry.

Q Can you -- can you tell me what your understanding is that the system that uses hangers hanging from a messenger wire, what that system does or what that system is?

MR. DIXON: Objection to form.

A I don't know if I agree with your -- the word "system" that you're using. But I understand what the purpose of these hangers are that are hung from a messenger wire, if that's your question.

Q (BY MR. FLYNN) What do you understand the purpose of the hangers hanging from the messenger wire is?

A It's supporting a plurality of conductive cables.

Q That's it? Is that the extent of your

understanding?

A Cable management, supporting cables, separation of cables. That's the -- this patent about.

Q You said "separation of cables." What do you mean by separation of cables?

A Putting distance between cables as required, necessary.

Q And what distance needs to be put between cables as -- strike that.

Why is it required or necessary to put distance between cables?

A Current-carrying cables have -- produce magnetic field that may induce the voltage into the nearby data cables, and that may cause disturbance or distortion. So we put space between those.

Q I'm sorry, what was the last thing you said?

A We put space between those. Current-carrying cables with data cables.

Q Is that your understanding of the purpose of separating the cables as claimed in the '291 patent is to put space between the current-carrying cables and the data cables so as to prevent magnetic fields of those different kinds of cables from

crossing?

A That's one purpose of spacing.

Q What other space -- what other purposes of spacing the cables as described in the '291 patent do you understand?

A Separation of wires, supporting different types of wires.

Q What do you mean "separation of wires" and "supporting different types of wires"?

A If you have AC wires or AC cables, you want to -- in one side. You want your other types of controls, for instance wires, on the other side in addition to that.

Q If I understand what you're saying, if you have AC cables on one side of the hanger --

A Uh-huh.

Q -- and I think -- did you say control wires on the other --

A Or data.

Q Or data cables on the other side. You want to keep those separate?

A In addition to technical issue of inducing voltage, or crosstalk, cross-induction, you can separate them. That's ease of installation. That's another example for that. Maintenance.

Q Okay. But as I understood, before you just said about maintenance and ease of installation, what you were saying before is that you would separate AC cables on one side of the hanger from data cables on the other side of the hanger, correct?

A I will separate them. That's what my statement is. I will separate data cables from current-carrying cables.

Q And what's the purpose of separating data cables from current-carrying cables?

A Cross induction.

Q When you say "cross induction," is that the same thing as what you explained about the magnetic fields crossing?

A That's correct.

Q That's the same thing?

A (Nodded head.)

Q Okay. So you would space AC cables apart from data cables to prevent the cross induction or crossing of magnetic fields between those two types of cables; is that right?

A I would place current-carrying cables. I will distance, distance between current-carrying cables and data cables.

Q To prevent that cross induction or

crossing of magnetic fields?

A Correct.

Q Okay. Would you separate DC current-carrying cables from AC current-carrying cables to prevent that cross induction?

A You don't need that. Both of them are current-carrying cables.

Q So if the current-carrying cables are in the same surface of the hanger, you don't need to separate current different types of current-carrying cables from each other to prevent cross induction?

A Generally speaking. However, you could separate AC and DC cables. That's not because of cross, but it's for maintenance, installation and so on.

Q I see. But for purposes of preventing cross induction or the crossing of magnetic fields, you don't need to separate current-carrying cables from each other?

A You usually don't do that.

Q Would you turn, please, Dr. Beik, to Claim 1 of the '291 patent which appears in Column 10.

Do you understand, sir, that Claim 1 is directed to a system for organizing a plurality of

electrical cables extending from a plurality of solar panels?

A That's what it reads here.

Q And you understand Claim 1, then, to be in the context of electrical cables extending from solar panels?

A Yes.

Q If you look at -- do you know which is the preamble and which is the body of the claim?

A Can you explain to me?

Q Sure. So what I just read, a system for organizing a plurality of electrical cables extending from a plurality of solar panels, that's in the preamble of the claim.

A Uh-huh.

Q What follows after the word "comprising" is the body of the claim.

A Uh-huh.

Q Okay?

So if you look at the second paragraph of the body of the claim that starts with, A plurality of cable hangers.

Do you see that?

A Yes.

Q Would you read that paragraph that's -- or

that element of the claim, please?

A Starting from, a plurality?

Q You don't have to read it out loud. I mean just read it to yourself. Starting with, A plurality of cable hangers.

A (Deponent complied.)

Q Okay. The portion of that element that starts with Each cable carrying surface being structured to -- do you see that?

A Yes.

Q And it goes on, Each cable carrying surface being structured to support at least one electrical cable of the plurality of electrical cables.

Do you see that?

A Yes.

Q When it refers to the plurality of electrical cables, do you understand that that's referring to the plurality of electrical cables extending from a plurality of solar panels as recited in the preamble of the claim?

A Yes.

Q Is there anywhere else that you see in the body of the claim the rest of Claim 1 that follows the word "comprising," is there anywhere else in the

body of the claim that refers specifically to the plurality of electrical cables being the plurality of electrical cables extending from a plurality of solar panels?

A I did not get that.

Q The only portion of Claim 1 that describes the plurality of electrical cables is the preamble that identifies those electrical cables as extending from solar panels, correct?

A The preamble, as you stated, mentions that.

Q And that's the only portion of Claim 1 that identifies the electrical cables as being the electrical cables extending from the plurality of solar panels, correct?

A Well, as you just said it, in the second one it says a plurality of cables again.

Q Yes, but there it doesn't say anything about extending from solar panels, right?

A Oh, that's what you mean, extending from the solar . . .

Q Yes.

A Okay. Yes, I understand that's what it says.

Q Okay. So you understand that the

electrical cables of Claim 1 are the electric cables extending from solar panels?

A That's what it reads.

Q Okay. Would you go to Column 1, please.

You had -- we talked before about your declaration in Paragraph 39 where you refer to -- strike that.

In Column 1 starting at Line 18, the first sentence under Background of the Invention, where it says, This invention has to do with a locking cable hanger system for use in the solar, mining, and electrical industries.

Do you see that?

A Yes, sir.

Q But going back to Claim 1 in Column 10, that claim is specifically reciting that kind of a cable hanger system for the solar industry. You understand that?

A That's what that claim says.

Q Yes.

A It does not solar -- mention solar industry.

Q Well, it refers to solar panels, right. Right.

(Reporter clarification.)

A I was referring that it says solar panels. As I have written, coauthored, a book with Dr. Patel, solar is one of the prime or the most primary energy source in space. We don't call it the solar, you know, industry. I just wanted to clarify.

Q (BY MR. FLYNN) Right. But you do understand that Claim 1 is not about cables extending in the mining or electrical industry. The Claim 1 is specifically about the cables extending from solar panels.

A That's what it discusses. But reading the whole patent, the patent talks about mining and electrical industries --

Q Right.

A -- which is not -- which is not limited to solar.

Q Right. So that's in the specification that it talks about solar, mining and electrical, correct?

A Correct.

Q But in the Claim 1 that we were just referring to that's just talking about solar?

A I would like to read it once again to make sure --

Q Sure.

A -- that your statement or -- and my statements are accurate.

Q Sure.

A The first portion refers to solar panels. The second, or the body that you mentioned, does not. It does not mention that it is for solar panels. It talks about cables and cable hanger structure.

Q I understand. But then let me take you back again to that claim and that second element of the body that refers to, each cable carrying surface being structured to support at least one electrical cable of the plurality of electrical cables.

You see that, right?

A I read this.

Q And the plurality of electrical cables is referring to the plurality of electrical cables extending from the plurality of solar panels, correct?

A The first part it says the plurality of cables. It doesn't say that it's mentioning to solar panels. You are inferring that this is referring to the solar panels based on the first part.

Q So when it says, in the second element of the body of the claim, structured to support at least one electrical cable of the plurality of electrical

cables, you don't understand that to refer back to where it says, a plurality of electrical cables extending from a plurality of solar panels?

A What I understand, sir, is the first part mentions solar panels. Throughout the patent discusses mining, electrical. And being of an electrical engineering background, I know that the same thing exists in other industries.

So the first part says solar panels and the second part does not mention solar panels. Is this applicable to solar panels? I'm in agreement with that. Is it not applicable for mining or other industries? I do not agree with that.

Q But I'm just talking about the scope of this Claim 1. So whether the same concept could be applicable to mining or electrical industries, I'm just talking about what Claim 1 is directed to and that Claim 1 is directed to solar. Would you agree with that?

A The first portion of this, I agree it is.

Q Thank you.

Now if you go back -- now I can take a break for you.

(Recess from 11:20 a.m. to 11:31 a.m.)

MR. FLYNN: So counsel have stipulated

that what we can do with Dr. Beik's deposition transcript is rather than having two separate transcripts, one for the '291 IPR relating to today's deposition and a second transcript on Thursday for the deposition relating to the '551 IPR, we will just have one deposition transcript that will be submitted in both IPRs as Exhibit 2004 and it will be just the same transcript, to avoid duplication of questioning, et cetera.

But also to clarify that at the end of today's deposition, which we'll just call Part 1 of the transcript, that that will conclude the questioning relating to the '291 IPR. And then on Thursday we will just resume with the questioning relating to the '551 IPR.

Does that all sound right?

MR. DIXON: Yes.

MR. FLYNN: It will just be one deposition transcript, the same deposition transcript submitted as Exhibit 2004 in both IPR proceedings.

Q (BY MR. FLYNN) Okay. All right. Dr. Beik, who engaged you to -- as an expert on behalf of AWM in this litigation? Who contacted you?

A Do you have the petition?

Q Yes.

A The name -- the petition from . . .
Q I shouldn't have given you my working copy, but that's okay.
A I'll just return.
Mr. Surge Subach.
Q Okay. Did you know Mr. Subach before he contacted you to serve as AWM's expert in this litigation?
A No.
Q All right. If you go to -- back to the '291 patent, please, in Column 1.
If you go to the second paragraph, beginning on Line 32, starting with, Prior to 2014.
Do you see that?
A Yes.
Q And it reads, Prior to 2014, AC and DC cables could be bundled immediately adjacent to, and touching, one another in a wire management system for the solar panels.
Do you see that?
A Yes.
Q So that sentence is specifically referring to solar, right?
A I see this.
Q And then it says, In the new National

Electric Code of 2014, the AC and DC cables must not be immediately adjacent to one another, but must have a degree of separation from one another.

Do you see that?

A I see this.

Q Do you know what provision of the 2014 NEC this portion of the specification is referring to?

A I can't recall.

Q Have you reviewed the NEC prior to today to identify that section of the 2014 NEC that required AC and DC cables to be separated?

A I have reviewed the NEC, some parts of it. I don't exactly recall this statement, where it was or which section it was or if it was there or not.

Q Did you review it specifically in the context of your expert services in this litigation?

A Yes, and in my declaration.

Q But you don't remember if you located or identified the specific provision that this portion of the specification is referring to?

A It's -- what I have referred to my declaration, that's the part.

Q Okay.

A If you're referring to other parts, I don't know. I can go and check which part or where

it is.

Q Okay. So is it fair to say that anything that you checked in the NEC, you would have included -- let me start that over.

Anything --

Let me really start it over.

Is it fair to say that anything that you reviewed the NEC for and any provision from the NEC, 2014 NEC that relates to this aspect of the specification, you would have identified in your declaration?

A I don't know if I would identify everything that I have read, but parts of it what I have identified, is in my declaration is what I have identified. But things that I have read but not included, there might be.

Q If you would have located or identified the provision of the NEC of the 2014 NEC provision that required separation of AC and DC cables, would you have put that in your declaration?

A I need to -- there are places that I have discussed -- referred to NEC here. Is that what you're referring to?

Q No. I'm trying to ask a very simple question, which is -- and I may be making it more

complicated than it's worth.

But all I'm trying to ask you is, that portion of the specification that talks about the new 2014 NEC requirement to separate AC and DC cables, if you had located that specific provision in the 2014 NEC, can we assume that you would have identified that provision in your declaration?

A I can't say. At the time of preparing this declaration, I included what I thought was sufficient evidence. But I --

Q Okay. That's all I -- thank you.

So what is your understanding, Dr. Beik, as to why the 2014 NEC requires separation of AC and DC cables?

A Can you repeat your question? Sorry.

Q What is your understanding as to why the 2014 NEC included a new requirement that AC and DC cables be separated?

A I want to make sure that this comes across. This has been known for a long time. NEC put it into their document in 2014, but that's the same effect that I discussed, the cross induction; but it has been known in the field for a long time.

There are papers on it to minimize the inductance from the cross induction. It's called

mutual inductance. So it's a well-known problem, or well-known matter. It may not be a problem in the field. But as the power system grew, we have more cables, more things. Then NEC felt a need that we have to put this in. That's my understanding.

Q Okay. But is it your understanding that they put it in to separate DC cables from AC cables to prevent that cross induction?

A AC/DC mostly cross induction with data and controlled cables. There will be cross induction AC and DC as well, but as I discussed it, you may not do that. It's not going to be as significant because the current in each of those is high enough that it will not be distorted.

But in a signal or control cable, the current and signal is very small, milliamp, maybe small amp. So the effect would be much visible distorted signal.

Q Okay. Whereas AC and DC you may have some, but it's not going to be nearly of the same magnitude as AC and DC on the one hand and data cables on the other hand; is that right?

A As long as they're within the same voltage range. If your AC is 230 kilovolt and DC is a thousand volts, you also would want to separate.

Q For cross induction purposes?

A Because the AC is significantly higher current or higher voltage, or DC is higher current or higher voltage.

Q Okay. If AC and DC are in the same voltage range, you don't have to worry about cross induction; but if they're in significantly different voltage ranges, you still have to separate them for cross induction there; is that right?

A I want to be careful about this. You don't have to worry about it. Depends on the application and the current that goes through them. It's not only voltage.

It's a good practice if you can, if the design, installation everything allows for it, to separate all those cables because, again, there will be cross induction between DC and AC.

Q Okay.

A But like if they're around the same voltage -- and this is where the designer will consider the current in those two, and it's simple, calculates the magnetic field, how much is an effect over that distance. Is it going to cause 20 percent drop voltage? Then the designer will come and say, Yes, we should do it.

I have seen systems that there are 27 percent, in one of my consultancies, cross induction between AC and DC, but still there were other considerations such as cost --

Q Okay.

A -- that they still did that. They put it together.

Q When you say "they still did that," you mean they bundled them together still or kept them together?

A I mean, there is a distance but it's not required.

Q If all the cables are in the same voltage range, then there's not a concern for cross induction effect; is that correct?

A That is not -- that is not correct.

Q I thought that's what you just said. Then I misunderstood.

A I said we also have to consider the current. So bottom line is that you need to calculate the magnetic field. If the effect is negligible, then there is no need. If the effect is not negligible, if the effect is less than .1 percent or 1 percent, but if it's 20 percent, no matter the voltage or current level.

Q Okay. And we're talking about DC versus -- DC and AC cables, correct?

A Correct.

Q DC cables are going to have the same voltage and current level together if all the DC cables are together?

A Usually. Not necessarily.

Q If DC cables are bundled together in one hanger surface, are they going to have the same voltage and current level, that you don't have to worry about cross induction?

A Not necessarily.

Q Under what circumstances would you have to worry about cross induction if we just had DC cables bundled together?

A Power electronic devices have switching effects. Those transients. So those transients are seen by the DC cable. Those transients will induce cross induction.

Q What's happening that -- when you say transients, you're going to have to explain that for me. I'm above my pay grade here.

A How does an inverter work? Converts DC to AC.

Q Correct.

A Generally. How does that happen? There are power electronic switches. You have a Tesla charger as well, that they start switching in specific combinations to take that DC, chop it -- for lack of a better word, chop it into pieces of AC and create that AC. Those switching induce transients into the DC as well as AC.

Q And that's at the point of conversion from DC to AC?

A It depends on the wavelength. It could travel depending on the wavelength, on the frequency and so on.

Q It could travel where?

A Within the cable. The transients could be seen distance.

Q You mean from the point of the inverter where it's converted? From that point further down, that same transients, if I'm using the right word, could continue to travel. Is that what you're saying?

A Until it's damped. So that calculations, it's a calculation you'll need to calculate to see this, where does this -- how long this waveform travels in terms of wavelength and then relate that to the length of the cable.

Q Okay. But that transients doesn't begin until the conversion from DC to AC?

A That's all the time. That's life.

Q Specifically in the context of the solar panels?

A That's life all the time.

Q If we have DC cables coming off the solar panels --

A Uh-huh.

Q -- and those DC cables are bundled together --

A Uh-huh.

Q -- up to, let's say, the combiner box.

A Uh-huh.

Q From the solar panels to the combiner box, the DC cables coming from that solar panel, those cables are going to have the same current and voltage, right?

A I can't say that.

Q Would there be any need to -- would there be any need to separate DC cables --

A That was not your question, sir.

Q Okay. Well, I'm trying to ask the questions the best I can.

A So let me clarify. Maybe this is where

the confusion is.

You can have three panels or ten panels, series and paralleled, coming with a DC cable with another we call it a group or circuit. That's three -- that's 30 panels. So they are not at the same voltage. Okay? And they come together, come to that breaker box or combination box or electrical box or substation.

What you are assuming is an ideal case that you have X amount of panels cabled together and exact same cabled together series and parallel coming to a box. That's one case of --

Q What was the last thing you said? Coming to a combiner box? Is that what you said?

A Yeah. But it could be different circuits, what we call them. So it means we put ten panels here, we put 12 panels here, we connect them, they come to the cables. It will not have the same -- they may not have necessarily the same voltage.

Q So the other question, then, that I started to ask and you said that that wasn't the question I asked, if you have DC cables bundled together --

A Uh-huh.

Q -- will there be cross induction effect

between those DC cables bundled together?

A Unless there's transients, no.

Q If data cables are bundled together, can there be cross induction effect between data cables bundled together?

A Theoretically there will be some levels of EMI, electromagnetic interference. That's why they have shields.

Q Would you need to separate data cables from each other to prevent cross induction?

A Generally, no, because they come with shields. That's to prevent EMI, which is a similar effect than induction.

Q Do I understand correctly, then, that even though data cables will typically have that shield --

A Uh-huh.

Q -- that that wouldn't be enough to prevent cross induction between current-carrying cables and data cables?

A Usually, yes.

Q Usually that would not be enough. There would be cross induction effect; is that right?

A True. That's what I meant. Usually there will be cross induction because the current-carrying cables have significantly stronger magnetic field due

to the higher current than data or controls or sensors and so on.

Q Okay. Dr. Beik, if you'd look again, please, at Claim 1 of the '291 patent.

A Okay.

Q The claim starts out, a system for organizing a plurality of electrical cables extending from a plurality of solar panels.

Based on our discussion today, is it your understanding that organizing a plurality of electrical cables extending from a plurality of solar panels, as recited in Claim 1, is referring to separating DC and AC cables from data cables?

A That is correct.

Q Is it your understanding that that is also referring -- that organizing the plurality of electrical cables extending from a plurality of solar panels is also referring to separating DC cables from AC cables?

A It could be. It could also be pulling cables together to hang or to a system and moving them forward.

Q Managing --

A Managing cables, cable management. It does not necessarily have to be because of the cross

induction.

Q Okay. So is it your understanding, then, that within the scope of Claim 1, organizing a plurality of electrical cables extending from a plurality of solar panels could mean or include separating DC cables from AC cables not to prevent cross induction but as a way of managing those cables to carry them along the route ultimately to the combiner inverter box?

A That's one of the possibilities.

Q Are there others?

A Yeah, AC/DC and data cable, control cables.

Q Yeah, I'm just talking about DC and AC right now.

The one reason for separating DC and AC within the organizing claim term of Claim 1 would be to separate AC from DC as part of the management of supporting them along the way but not to prevent cross induction?

A Or because DC cables are heavier or they -- for maintenance or for replacement. So there might -- what you are saying is one reason for doing it but not the only reason.

You have to go to the design. I'll give

you an example. Rooftop solar panels, I've installed them in our lab. We generate -- we have perhaps 10, 15 of those. Because the voltage is low and the current is low, we calculated magnetic field, we didn't need to separate the AC and DC. And the distance from the data that we have is -- it's a safe distance that prevents crosstalking, cross induction.

So what you are saying is an example or one reason to do it, not the only reason.

Q Okay. And when you say what I'm saying is a reason to do it, are you referring to the cross induction or are you referring to just supporting the cables separately?

A Cross induction is one reason to separate cables.

Q Okay.

A But if you go back to prior to this NEC, which is not in effect, still that practice was done generally. That is a well-known issue in the field.

Q When you say "that practice," you're talking about separating cables to prevent cross induction effect? Is that what you're saying?

A Correct. Carrying mainly from some data cables.

Q Dr. Beik, would you go to Paragraph 52 of

your declaration, please. Paragraph 52 is within the heading of Invalidity Grounds, correct?

A That is correct.

Q And you state in Paragraph 52 that in your opinion there is nothing novel about the '291 patent's invention, correct?

A Correct.

Q And you also state that. The prior art discloses precisely the systems and methods claimed in the independent claims of the '291 patent, right?

A Yes.

Q Okay. And then you go on to state that in your opinion the prior art references that you rely on for your opinion, specifically Caveney, Carr and Almy, either alone or in definition with each other, disclose the claimed systems in the '291 patent, correct?

A Can you tell me where it says that?

Q In Paragraph 53?

A 53. Okay.

Q It says, In particular, it is my opinion that the '291 patent claims are invalid based on the following grounds: The cited references themselves alone and/or a combination disclose the alleged invention.

Do you see that?

A I see this, sir.

Q So it's your opinion, then, that Caveney, Carr and Almy, alone or in combination with each other, disclose precisely the systems and methods claimed in the independent claims of the '291 patent; is that right?

A That is correct.

Q Carr doesn't have anything to do with solar, correct?

A I can't remember. It's -- can you give me the Carr, please.

Q I will at some point. Right now I'm just asking you --

A I need to go to look at it again to see if the word "solar" is mentioned.

Q Okay. Let me hand -- this time I'm not going to hand you my working copy. I'm going to wait for him to give me your copy.

Dr. Beik, you've just been handed what's been marked as Exhibit 1005 in this IPR, which is the Carr reference. Have you reviewed that reference before?

A I have, sir.

Q Okay. As you look at it now, does that

look familiar to you and refresh your recollection of what Carr discloses?

A Yes, to some extent.

Q Okay. Does Carr -- and look at it as much as you need to or want to. Does Carr have anything to do with solar?

A It does not mention the word "solar."

Q What is Carr directed to?

A Hanger devices of the type used for suspension of aerial conducting cable from a supporting strand.

Q This is a patent that was issued back in 1945, correct?

A It appears so.

Q And it was assigned to Bell Telephone Laboratories. Do you see that? It's right under where it says "hanger device" up at the top. Where it says James A. Carr Assigner to Bell Telephone Laboratories. Do you see that?

A Yes, I see that.

Q Are you familiar with Bell Telephone Laboratories? Have you ever heard of them or do you have any familiarity with them?

A I don't -- I've heard of them.

Q Okay. Is it your understanding that the

aerial conducting cables that are recited in the Carr reference are telecommunication cables?

A One application of this could be.

Q Well, I guess what I'm asking you is, specifically in the context of Carr, do you understand what the aerial conducting cables, that are identified in Carr, what those aerial conducting cables are?

A They're aerial conducting cables. Aerial cables that conduct current.

Q So you don't have an understanding that they are specifically cables in the telecommunications industry, specifically telecommunications cables?

A Electrical cables could be communication cables.

Q That's not what I'm asking. I'm asking your understanding of Carr's aerial conducting cables.

Do you understand that they are referring to telecommunications cables?

A I can't say that they are specifically and only referring to that.

Q Would you -- is it your understanding that they are data cables?

A My understanding, sir, is aerial conducting cables, one type of those could be data cables.

Q But it's not your understanding that the aerial conducting cables specifically referenced in Carr, that they are data cables? That's not your understanding, that they are limited to data cables?

A Can you please show me where it says "data cable"?

Q I'm just asking you for your understanding?

A And I stated my understanding as these are aerial conducting cables as stated here. It does not -- I cannot see -- if you can please point it out to me. I cannot see where it says "data cables."

Q And you can't see where they are telecommunications cables?

A It discusses carrier transmission in the next sentence.

Q What does that mean to you?

A It could mean data cables.

Q In the context of the Carr patent, do you think that carrier transmission would be referring to anything other than data cables with respect to the aerial conducting cables?

A I look at the patent as a whole. It says aerial conducting cable. And when I read it, I read that they have stated carrier transmission, which is one type of aerial conducting cables. That's my conclusion from this patent from this wording, from the way that they have described it.

Q And if it's a carrier transmission, that would be referring to data cables, correct?

A It could be. Usually that's what we -- that's what it refers. In the second sentence it says that. But it does not limit aerial conducting cables to carrier transmission.

Q And you think that Carr could be disclosing aerial conducting cables in the context of solar?

A There is no word mention of "solar." I would treat this as aerial conducting cables and hanger for use in electrical industry.

Q So you would agree that Carr alone does not disclose precisely the systems and methods claimed in the independent claims of the '291 patent?

A Precisely means that in that context is that this discloses the idea of managing cables. That's what it means there. That was what it meant.

Q So precisely doesn't mean disclosing every

limitation of the claim in the '291 patent, correct?

A I don't understand what you mean.

Q When you say that a reference discloses the systems and methods claimed in the independent claims of the '291 patent -- that's what you said in Paragraph 52 of your declaration. Do you mean that the reference discloses all the limitations of those claims as recited in the patent?

A That's not that statement. That's not what it means.

Q That's the way I would interpret it. So what does it mean?

A It means it discloses the same idea.

Q Just the same idea?

A And, therefore, it covers some of the applications or claims that's stated in the other patent.

Q Are aerial conducting cables the same as power cables?

A Aerial is referring to the cables that not under the ground or on the ground is aerial. Conducting could mean any type of cables, AC, DC signal.

Aerial conducting, if you go outside this building I'll show you. Telecommunication cables, AC

cables, three-phase cables and single phase. They are all aerial conducting cables.

Q Excuse me. The aerial conducting cables specifically referenced in Carr, Carr's aerial conducting cables --

A It doesn't define what aerial conducting cable is.

Q So you think that could be referring to power cables?

A Aerial conducting cables means anything in the first instance. It is giving, the second instance, a transmission carrier as an aerial conducting cable.

Q So you wouldn't think a carrier transmission aerial conducting cable would be a power cable, would you?

A I have to look at it. I wouldn't know.

Q Okay. Dr. Beik, we've handed you what has been marked as Exhibit 1003, which is the Caveney reference. You've reviewed this reference?

A I have looked at it.

Q When I ask you if you've reviewed and you say you have looked at it, is that the same thing? Are we talking about the same thing?

A I guess I don't know what review means

exactly. But I know when I say I look at something, I know what -- what I'm looking at it.

Q Have you analyzed Caveney?

A I have analyzed it.

Q Okay. What is Caveney directed to?

A A cable support system.

Q What kind of cables does Caveney's cable support system support?

A I cannot remember off the top of my head.

Q Okay. Take a look at Column 1, the first sentence under Background of the Invention, please.

A Uh-huh.

Q If you look at that, does that refresh your recollection as to what Caveney is directed to?

A To a multi-tiered system for supporting high-performance cabling.

Q What is high-performance cabling?

A A cable whose losses are low, that's one type of high performance.

Q Is a power cable a high performance cable?

A If you have a power cable that the loss is significantly lower than other types, you can call that a high-performance cable.

Q Specifically with respect to the high-performance cabling as described in Caveney,

what do you understand those high-performance cabling to be?

A Caveney seems to refer to high-performance cabling in telecommunications.

Q Okay. So they would be data cables?

A In this example what it --

Q That's what I'm asking you, specifically in the Caveney example.

A I don't know if other places in patent it says not limited to, but as I read the first sentence, high performance cable in telecommunication.

Q Is it your understanding that Caveney has anything to do with solar?

A I don't see a solar word here or mention of solar.

Q Is it fair then to say that Caveney doesn't describe or disclose all of the limitations of the independent claims of the '291 patent?

A That might be a fair statement.

Q Dr. Beik, have you reviewed the prosecution history for the '291 patent?

A I have looked at it.

Q And so have you analyzed the prosecution history for the '291 patent?

A I have analyzed it.

Q I'm going to use that word from now on, "analyzed." And if I say "review" it means analyzed.

Are you aware or do you recall that during prosecution that the examiner initially rejected the '291 claims over the Carr reference? Do you recall that?

A I can't remember specifics. Can you show it to me, please.

Q Yeah. I'm going to show you relevant excerpted portions of the file history.

A That's fine.

Q The fill history is just --

A That's fine.

Q -- stuff that we want to focus on.

So this is -- yeah. So this -- what we're handing you is an excerpted portion of what has already been marked as Exhibit 1015. Exhibit 1015 in its entirety is the entire file history. We're just handing you an excerpted portion of that exhibit.

A Thank you.

Q And please take a look at that. On Page 2.

A Page 152.

Q Well, actually no, I was referring to the

Page 2 up here in the corner.

A Oh.

Q It's the first page of this excerpted exhibit.

MR. DIXON: And I'd just like to identify for the record that this excerpt is Page 151, 152, 202, 210 and 211 of Exhibit 1015.

MR. FLYNN: Thank you.

Q (BY MR. FLYNN) So if you look at -- now referring to the page numbers in the bottom right corner of this excerpted exhibit, if you look at Pages 151 to 152, does that refresh your recollection that during prosecution the examiner had rejected various claims of the '291 patent over the Carr reference?

A Yes.

Q And on Page 152, in the middle of the page, the paragraph that begins with Carr discloses -- I'm sorry. Not that paragraph.

The paragraph that begins with, Because both the prior art --

Do you see that?

A Yes.

Q So Because both the prior art disclosed by applicant and Carr disclosed cable hangers for

supporting a plurality of cables in a messenger wire, it would have been obvious, et cetera.

Do you understand that the prior art disclosed by applicant was referring to what the examiner understood to be prior art disclosed in the '291 application or the application for the '291 patent?

MR. DIXON: Objection to form.

A Like which patent or which prior art?

Q (BY MR. FLYNN) That the examiner was referring to what he understood to be prior art that was referenced in the specification of the '291.

MR. DIXON: Objection to form.

A Can you tell me which one? Like which prior art?

Q (BY MR. FLYNN) I'm asking you what your understanding is of the examiner's rejection.

A It's referring to prior art, but I don't know what is referring to -- which one or what exactly, not from this sentence.

Q So when it says, prior art disclosed by applicant, you don't know what that's referring to?

A Not exactly. I know it's a prior art disclosed by the applicant.

Q In its application, in the applicant's

application.

A That's what this states.

Q Okay. And then based on that prior art, which the examiner understood had been disclosed by the applicant in its application, and Carr, the examiner rejected these claims as obvious, correct? Is that your understanding?

A Yes.

Q Okay. Do you also understand from analyzing the file history, the prosecution history for the '291 patent, that in response to that rejection one of the inventors submitted a declaration? Do you recall that?

A Can you show it to me, please?

Q I'm just asking you, first of all, if you recall that that happened.

A There has been some document that I looked at, but I need the document to look at it to see what it was exactly.

Q But you at least recall that the inventor -- one of the inventors had submitted a declaration in response to that rejection? Even if you can't remember sitting here what it said, you remember that that happened; is that right?

A It may have. I can't really put a pin on

if -- which document is or if there was a document. If you can show it to me, that's -- I will recognize it or not.

Q Do you recall, Dr. Beik, that after that declaration had been submitted by the inventor, do you recall then that the examiner allowed the claims?

A I recall at the end the examiner allowed the claims --

Q Okay.

A -- or some of them or whatever it was in there.

Q Could you turn, please, to Page 211, which is the last page of this excerpt exhibit.

A Uh-huh.

Q Under the heading Allowable Subject Matter, do you see that?

A I see this.

Q It identifies the claims that are allowed, and then what follows is the Examiner's Statement of Reasons of Allowance.

Do you see that?

A I see that.

Q And the examiner states, The prior art does not disclose or suggest a system for organizing a plurality of electrical cables extending from a

plurality of solar panels with a plurality of cable hangers disposed along a messenger wire with cable carrying surfaces structured to support at least one cable and separated by a cable carrier divider.

Do you see that?

A I see this.

Q You understand that the examiner was saying that the prior art, including Carr, did not disclose the claims of the '291 patent for organizing a plurality of electrical cables extending from a plurality of solar panels as recited in those claims?

A That's what it states here.

Q You disagree with the examiner?

A Absolutely.

Q Have you ever seen or observed the CAB system, the Cambria County Association for the Blind and Handicapped, the CAB cable management system that uses hangers suspended from a messenger cable to support electrical cables extending from solar panels?

A I have seen this patent, if that's what you're saying.

Q Have you ever seen an actual CAB system?

A In reality, like in person?

Q Yes.

A I have not.
Q Have you ever seen photos depicting an actual CAB system?
A Prior to this IPR, no.
Q But in this IPR you have?
A I have reviewed the website, looked at the website.
Q And so what you see on the website is what you know of CAB's cable management system using the hangers suspended from a messenger wire to support the electrical cables extending from the solar panels?
A I don't know about all their products. Some of them is there. I've looked at it. I don't know what exactly their product line, all of the product line is.
Q I understand. But what you have seen --
A I have seen cable hangers -- sorry.
Q What you've seen of CAB's system is what you have seen on the CAB website; is that right?
A And white paper that they had on their website. So I have explored CAB website, different pages on CAB website, their white paper, things like that.
Q Had you ever prior to seeing CAB's cable

management system on its website and/or in the white paper that's on its website, had you ever seen a cable management system that used hangers suspended from a messenger wire to support a plurality of electrical cables extending from solar panels?

A The work that we did for solar rooftop that we had and managed the cables, that was a cable management system. The conduit that we ran.

Q That was not my question. So I'd ask you to listen very carefully to my question.

My question is, before you saw CAB's system on its website or in its -- in the white paper on its website that shows how CAB uses hangers suspended from a messenger wire to support cables extending from solar panels --

A I don't recall.

Q I haven't finished my question.

A Sorry.

Q Before you saw that on CAB's website, had you ever seen any other system that used hangers suspended from a messenger wire to support electrical cables extending from solar panels?

A I don't remember.

Q You don't remember that you ever saw one?

A This is not something that I would go and

look for it. So I do not remember, sir.

Q So you didn't see it because you never had reason to look for it? You didn't see it in any publications or other websites? I take it you didn't see any in-person systems? I think you've already told me that. You never saw, in person, any system that used hangers suspended from a messenger wire to support electrical cables extending from solar panels, correct?

MR. DIXON: Objection to form.

A I don't remember seeing hangers, but I may have seen it. I have not been to a solar plant. But the cables that come out of a solar plant and they travel distances, I wouldn't know they are source solar panel or not. They come to a substation.

Q (BY MR. FLYNN) Have you ever been to a solar plant?

A You asked this at the beginning and my answer was no.

Q Okay. Would you look again at Caveney, please, Exhibit 1003. Dr. Beik, the -- you're not contending, are you, that Caveney's cable support system as disclosed in Caveney is suspended from a messenger wire, are you?

A It is suspended from a structure.

Q Is it your opinion that Caveney's cable support system can be suspended from a messenger wire?

A Absolutely they can. Would you like me to show you?

Q You're going to get your chance.

You've read the -- strike that.

You've analyzed the institution decision that was issued by the board in this IPR --

A I have.

Q -- have you not?

A I have.

Q Page by page?

A I can't say page by page, but I have understood it.

Q Okay. Would you please -- we've just handed you the institution decision that was entered by the board in this IPR. Would you please turn to Page 15 of it.

And the second paragraph that begins right above the Figure 3 that starts with, We are not persuaded. Do you see that?

A I see this.

Q And the board says, We are not persuaded that Caveney's cable hangers -- which are Caveney's

cable support system, right?

A That's -- yes, is what it discusses.

Q We are not persuaded that Caveney's cable hangers are structured to be disposed along and suspended from the messenger wire as claimed.

Do you see that?

A That's what it states.

Q And you disagree with the board's statement in that regard?

A Yes, I do.

Q Do you agree that the -- well, actually if you turn to Paragraph 59 of your declaration, you state in Paragraph 59 that the disclosed structure in Caveney is broadly defined in an open-ended manner, correct?

A Correct.

Q And on the next page you include in your declaration a block quote from Caveney?

A Yes.

Q And based on that block quote, your understanding from that is that Caveney's cable support systems, its hangers, are structured to be attached to any kind of structure; is that right?

A Within the application. POSITA would know, within the application. There are limitations

within the application.

Q What do you mean "within the application"? What application?

A For instance, you may have a specific structure in construction that you may not have in solar panels. So you wouldn't go and take an I-beam and install an I-beam in a solar panel. That's constrained by the application. A POSITA would know that.

Q But are you saying that a POSITA would understand that you could take one of Caveney's hangers and attach it to any kind of structure?

A With modifications.

Q Do you agree that Caveney's hanger, as disclosed in Caveney, is disclosed as being attached to preexisting interior building structures?

A I'll read from that: May be secured. However, it is likewise contemplated that cable support system 30 may be secured directly to any fastener or a structure, including but not limited to.

Q Where are you reading from?

A The page that you showed me. My declaration --

Q Oh, within that -- within that block

quote?

A Which this quote is from Caveney.

Q Yes.

So what you just read, it is likewise contemplated that cable support system 30 -- well, let me back up.

What you read was that As shown in Figure 20, cable support system 30 may be attached directly to a structure such as a ladder rack 38, correct?

Do you see that?

A I read after it, yes.

Q Yeah, but do you see where I just read from?

A I see this.

Q And ladder rack 38 in Caveney is an interior building structure, correct?

A I don't know. Ladder rack 38. Can you tell me where 38 -- oh, I see it, sorry. It could be inside the buildings, yes. It could be.

Q But it's not your understanding that the structures disclosed in Caveney are all interior preexisting building structures? That's not your understanding?

A It says, including but not limited to.

Some of them it may be. If it's a messenger wire, it may not be.

Q Other than the language that says, including but not limited to --

A Uh-huh.

Q -- whatever structures are specifically identified in Caveney --

A Uh-huh.

Q -- would you agree that they are all preexisting interior building structures?

A You pointed out 38 to me. I can't say 38 is exclusively preexisting inside the buildings.

Q I-beam 36, as disclosed in Caveney.

A Okay.

Q Would you agree that I-beam 36 is a preexisting interior building structure?

A I agree that it could be.

Q But as disclosed by Caveney, you don't think Caveney is limiting I-beam 36 to just an interior building structure?

A I am not sure if it's limiting this only to the building interior structure.

Q Are you able to point to me anywhere in Caveney where it would suggest that it's anything other than an interior building structure?

A When I look at it, 36 or 38, my conclusion would not be this is exclusively for interior inside the building for preexisting structures. It's one of those.

Q I think I understand that what you're saying is when you look at the figure that depicts the ladder rack or the I-beam, you look at that and you think, Well, you could use this I-beam outside somewhere. Is that what you're saying? As an exterior structure?

A You can use it as an exterior structure.

Q And the same thing with the ladder rack. You look at the figure depicting the ladder rack and you think, You could use this ladder rack as an exterior structure.

A And I read Caveney. It says, but not limited to.

Q Okay. But other than the but not limited to --

A Uh-huh.

Q -- would you agree that as Caveney describes the I-beam and the ladder rack, that they are only being used as preexisting interior building structures?

A I cannot come to that conclusion reading

the patent. I would say that's one of them.

Q And is the reason you can't come to that conclusion reading the patent solely based on the language in the block quote included in your declaration that says, including but not limited to?

A Not purely that. I read the abstract, A cable support system is disclosed. The cable support system includes a hanger plate securable to structure, a chaining plate attachable to the hanger plate, and a cable support member attachable to the hanger plate or the chaining plate.

Q Would you look again at the institution decision, please, at Page 15.

A Yes.

Q And within the first paragraph under the heading Analysis, the board states, Caveney's multitiered cable supports 30 -- support high-performance cabling used in telecommunications industry by attaching to preexisting building structures, such as I-beam, joists, ceilings and walls, and also by attaching to fixed brackets, such as ladder rack, bracket, 38, using fasteners.

Do you see that?

A I see that.

Q Do you disagree with the board's analysis

that Caveney's cable supports are attached to preexisting building structures?

A I agree with this that that's one application of it. As the patent reads and states, it's not exclusive to those.

Q If you'd look at Paragraph 60, please, of your declaration.

A Okay.

Q You refer to the threaded rod that's identified in that block quote that's included in your declaration as a structure; is that correct?

A Can you point to me where exactly you're referring to?

Q In the second sentence of Paragraph 60 you state, As an example, a Caveney cable hanger for attaching to the disclosed threaded rod --

Do you see that?

A I see it.

Q -- could also attach to a messenger cable.

A I see this.

Q So you're saying a threaded rod like a messenger cable is a structure to which the Caveney hanger could be attached?

A A threaded rod in this context means is what fastens that hanger to the messenger wire. It's

referring to this, both have circular cross-section to the shape of this.

Q So, first, you are now agreeing that the threaded rod is a fastener as disclosed by Caveney, not a structure; is that true?

A What is the definition of a "structure"? This sentence, as it reads, that's what they describe. As an example Caveney, or Caveney, cable hanger for attaching to the disclosed threaded rod could also attach to a messenger cable.

Q In the context of Caveney, do you understand that there's any difference between the term "structure" and "fastener"?

A What I understand is that what is referring to. It says, fastener or structure. So fastener, usually, what is referred to is fastens something to a structure. But is fastener by itself a structure? I don't know. Maybe.

Q I'm not talking about in general in the hypothetical theoretical ultimate layer. I'm talking about as disclosed in Caveney, would you agree that there's a difference between a fastener and a structure?

A It appears so, sir.

Q Okay. And the fastener is what attaches

the cable hanger or the Caveney hanger to a structure, correct?

A It appears so.

Q And would you also agree that it appears that the threaded rod is a fastener, not a structure, in the context of Caveney?

A Threaded rod is a fastener that fastens that to a structure.

Q Okay. So you're not saying -- at least now you're not saying that the threaded rod is the same thing as a messenger wire simply because they both have circular surfaces?

A Can you show me where it -- where I have said that they are -- a threaded rod is a messenger wire? My statement is the same. I'm referring to the shape of those. And there is a specific reason for that. And the reason is because the Hole 48 in Caveney is circular, like a messenger wire. It allows for a messenger wire to go through it, like it's using that to fasten that to a messenger wire.

Q Okay.

A That's what that refers to.

Q So in Paragraph 60 you specifically state -- in the sentence that starts with, As an example -- As an example, a Caveney cable hanger for

attaching to the disclosed threaded rod could also attach to a messenger cable because both structures have a circular cross-section, correct?

A That's what it states.

Q And so what you're saying there is that the threaded rod that is used as a fastener to attach Caveney's cable support system to a structure has the same circular cross-section as a messenger wire, right?

A Similar shape, yes. A circular cross-section so that one of the holes in Caveney could be used.

Q But it says, Because both structures -- both structures referring to a threaded rod and a messenger wire -- have a circular cross section, right?

A Okay.

Q That's what it says, correct?

A Sure.

Q Okay. And so you're saying in Paragraph 60 that Caveney's cable support system could be attached to a messenger wire in the same way that it could be attached to a threaded rod fastener that would attach it to another structure because the threaded rod and the messenger wire both have a

circular cross-section. Isn't that what that's saying in Paragraph 60?

A That is -- I don't -- I didn't understand the whole sentence. It was too long. But all I'm telling you what that says and what it is.

So if you are taking that out of context or however you want to spin that, I'm not sure.

This is saying a fastener has a similar cross-section than a messenger wire, and it could go through the hole, for example, 48, to hang that hanger to the messenger wire. It's referring to the circular shape.

Q When you say Hole 48, what are you referring to?

A Can you go to the Caveney, please? Maybe you can go to Page 16, Figure 20, 21 and 22.

Q I'm there.

A Hole 48. That's where a threaded rod could go to fasten this to that Structure 38. You could also use 48 to pass a messenger wire to hang this from a messenger wire.

Q Would you go to the institution decision, please, Page 17.

A Okay.

Q And at the institution decision at

Page 17, it also includes Figures 20 and 22 from Caveney, correct?

A Correct.

Q Okay. And Figure 22 shows the opening which I believe the board refers to as an aperture, correct? If you look at Page 17, it refers to, aligned apertures 46, 48 for a threaded bolt fastener.

Do you see that?

A Uh-huh.

Q So if looking at Figure 22, 46 and 48 are those two openings, or apertures, that the board is referring to there, right?

A Okay.

Q Do you agree?

A Can you repeat your question. Sorry.

Q Figure 22, apertures for openings 46 and 48 are what the board is referring to there on Page 17 in its analysis, correct?

A They refer to it as apertures.

Q And so the hanger portion of this itself is a hooked hanger that hooks over the section of the ladder rack, correct?

A That's what it seems, yes.

Q And the threaded bolt fastener is used to

secure that hook to that section of the ladder rack by being threaded into Apertures 46 on the one side and a threaded bolt -- threaded into Aperture 48 on the other side, correct?

A That could be, yeah, one way of securing that.

Q That's actually what's shown and disclosed in Caveney, correct?

A That's what it shows, yeah.

Q And so those threaded bolts that are being threaded through Apertures 46 and 48 to secure the hook to the ladder rack section there, they're going into -- through the apertures into the ladder rack, correct?

A That would be my conclusion. A threaded rod would go through that hole.

Q And you're saying that this hook, using a threaded rod -- or this hook, because it would be attached to a threaded rod fastener, could also be attached to a messenger wire because you could use that threaded rod fastener to secure the hook to a messenger wire?

A Replace Structure 38 with a messenger wire. The hook comes on top of messenger wire. You put the threaded rod. You secure it.

Q So the threaded rod, what, goes underneath the messenger wire?

A It goes into the same hole. That's one way of doing it. It goes through the same hole that the threaded rod goes. Just one application, if the POSITA would take this, replace 38 with a messenger wire, secure it with a threaded rod. That's one way of doing it.

Q Why would they do that? Why would they modify Caveney's cable support system hanger to attach it to a messenger wire instead of attaching it to the way they're showing it? What would be the reason for a POSITA to do that?

A Why wouldn't POSITAs would look at solutions in other industries, take the solution, modify it for their own solution. If there's an existing Caveney discloses a cable hanger that can support plurality of cable, put distance between them, why don't we use it? Why not?

Why an electric generator that's in power plant is the same electric technology that's in airplane? Why would they use that? Why the solar panel is on earth, we use it in space?

Because we are engineers and that's what we do. We look for solutions in other industries.

We take them, modify them for our solutions for our industry.

Q If you look at Caveney, Column 1, Lines 33, 35 -- or actually 33 and 36. It says, referring to the Caveney invention, It would also be desirable to provide an efficient cable support system that utilizes current cable support member capacity while providing the ability to increase capacity after initial installation.

Do you see that?

A I can read this, yes.

Q Would you agree that primary object of Caveney is to increase the efficiency of using hangers that are already being attached to preexisting building structures?

A Sorry, can you repeat? I don't understand the question.

Q Would you agree that Caveney would accomplish its efficiency or strives to accomplish its efficiency objective by using its hangers to attach to already existing building structures?

A That's one of the ways to use that. I have no objection to that.

Q And so where would the efficiency be in adding to Caveney's disclosure a messenger wire? How

would that accomplish Caveney's efficiency objective?

A Tell me what "efficiency" means, please.

Q Is that your answer?

A I would like to know what you're referring to by "efficiency."

Q I just read it to you from the Caveney specification.

A And do you mean cost? Do you mean weight?

Q What do you mean by "efficiency"?

A I didn't use the word, sir, you used it.

Q Do you have an understanding of what Caveney -- how Caveney is using "efficiency"?

A My understanding of Caveney is that you can use this for preexisting structures. There's nothing that limits a POSITA to use that, modify it, in any other applications.

Q So you're saying that a POSITA could do it; is that right?

A Yes. The POSITA would take an already solution in other industries, modify to the solution that we have because of the -- it's been tested. It's been tried. It exists. I don't have to go and redo the entire thing. That's what we always do.

Q You still have Carr over there, right?

A Yes, sir, I have it.

Q Dr. Beik, let's assume that the aerial conducting cables of Carr are telecommunications cables.

A Okay.

Q Would you agree that telecommunications cables are lighter weight than DC cables extending from solar panels?

A Usually.

Q You keep using the word "usually." Is there ever an instance that you can think of where a telecommunication cable would not be more lightweight than a DC cable coming off a solar panel?

A You didn't use the word "solar panel." You said DC cables. I can tell you the robotic arms that use DC motors, they use extremely small DC wires.

Q Okay. I beg to differ. I think I did, but if I didn't let me make clear now.

Would you agree that telecommunication -- telecommunications cables are much more -- much less weight than DC cables coming off solar panels?

A Yes, if the DC cable carries enough current.

Q What was the last part of that?

A If the DC cable carries enough current.

If you have a solar panel that is one milliamp and your data cable is from ten of those panels, your data cable is going to be bigger. I just want to be accurate, sir.

Q Okay. If you look at Column 1 of Carr, Lines 6 to 9, it talks about how these aerial conducting cables are generally supported by hangers punched from metallic sheets and bent in a manner to form a hook on each side of the blank.

Do you see that?

A I see this.

Q What do you understand that to mean?

A It's referring to hangers that are punched from steel sheets, metallic sheets and bent to form a hook.

Q What would it look like? What would that hanger look like?

A I can't -- there might be several illustrations. But one would be you can take a metal sheet, punch it and then bend it to look like a hanger.

Q Would it be a single surface hanger, a single carrier surface hanger?

A Not necessarily. You can have several loops in it or bends in it. You can bend it enough

to create as many as you want. It depends on the design.

Q Well, then what is -- the hanger device of Carr, how is that different than the hanger that you've just described that's punched from a metal sheet?

A This one is not punched. This is one piece that's formed -- my understanding of this -- in one shape, as disclosed in Figure 4.

Q So whereas the hanger before the Carr hanger, the hanger that's being described in Column 1 starting at Line 6, that's referring to a hanger that's punched from the sheet of metal?

A I can't exactly say what it is. It's such an old patent. Like in '45, I don't know what the practice was. But as a POSITA, this is one interpretation that I have from that statement.

Q But other than being punched from a sheet of metal, is it your understanding that that hanger would have the same appearance as the Carr hanger?

A Maybe not. I don't know.

Q Do you have an understanding where Carr says, continuing on in that same sentence, that the thickness of the sheet determining the extent of the space between the parallely disposed cables -- do you

understand what that means?

A I have an understanding of it.

Q What is that, please?

A The thickness of that metal or sheet defines the distance between the two cables.

Q So that sheet would still be formed in a hanger where you would have two cables within that sheet?

A I don't know how it would be formed. But it will be bent and punched and there will be a sheet, and thickness of that sheet defines the distance --

Q Okay.

A -- between the two cables or two sides.

Q So however it's formed by being bent or punched, there's going to be a sheet of metal between the two cables?

A The thickness of that sheet. That's what it appears. Maybe it's welded. I don't know.

Q Okay. And what Carr is describing is that if those two cables in that kind of a hanger, if they're too close together, Carr is saying you're going to have cross induction effect?

A You may have cross induction effect.

Q And so the purpose of Carr's hanger, now,

is to have a hanger that separates the cables with sufficient spacing between them to prevent that cross induction effect, correct?

A That's one purpose of it.

Q What else does Carr say is the purpose?

A It's a cable hanger. You can hang cables on two sides.

Q I'm just talking about what Carr discloses.

A If you -- referring to that statement, it says that's one of the issues, yes. It doesn't say that this hanger is expressly and only doing that job.

Q Look at Line 27 in Column 1 of Carr.

A Uh-huh.

Q The object of this invention is the provision of a hanger device of a simple and cheap construction which is capable of supporting two aerial conducting cables in an efficient manner and in large spaced relation to each other so as to minimize the cross induction effect between the cables.

Do you see that?

A I do.

Q Is there any other objective of Carr's

hanger that's disclosed there other than limiting cross induction effect?

A Let's analyze it, shall we?

Q Please.

A It's simple. Cheap, Number 2. Simple, Number 1; cheap, Number 2.

Construction which is capable of supporting two aerial cables, Number 3.

The Number 4 object is, to put the distance between them.

Within the same sentence I identified four functions for this.

Q I see. I see. So other than cross -- the four objectives of Carr's hanger as disclosed by Carr as you understand it include minimizing cross induction effect, but they're also to have a simple and cheap construction of the hanger, also to be -- what else did you say?

A What it is. It's not what I say. It's what the statement in the patent says.

Q Okay. What else were you looking at?

A It's supporting.

Q Two cables?

A Two cables. So it's supporting two cables.

Q Uh-huh.
A It's simple and cheap.
Q Yes.
A And --
Q Minimizes cross induction effect?
A Correct.
Q Correct?
A So you see, sir, cross induction was an issue in '45. NEC came 2014, put it. It's not an issue that it was suddenly came to effect. People knew it in -- well, before 1945, but let's call it '45 for now.
Q And, Dr. Beik, I'd ask you to turn back to Paragraph 32 of your declaration, if you would.
A Yes, sir.
Q In Paragraph 32, that's where you discuss this well-known concept even before 2014 of magnetic fields crossing, correct?
A Which is present in '45 patent, yes.
Q And you also refer in Paragraph 32 to the 2014 NEC. And at the bottom of Page 14 and continuing on over to Page 15, you say that, The NEC requirement is for the magnetic fields not to cross, correct?
A Yes.

Q Okay. And then you include these two -- this figure that depicts the magnetic fields; is that right?

A That's correct, sir.

Q So can you explain to me what happens -- using this figure, what happens when -- how this is depicting a magnetic field crossing?

A Okay. One dimension, that this is from -- one of those is either from IEEE or NEC, so this is not my picture.

(Reporter clarification.)

A This picture, Figure 2.2-3, it's not my picture. I took it from one of the references. It's either IEEE or NEC.

Q (BY MR. FLYNN) From the IEEE?

A From the IEEE, yes.

Q It's Exhibit 1019 that you took it from --

A Correct.

Q -- and Exhibit 1019 --

A Is IEEE.

Q -- is IEEE?

A That's fair enough. Thank you.

You can see that these two -- there are magnetic field -- magnetic field is those circular shapes that you can see around that positive and

negative. So positive meaning the current is going inside. Negative means coming outside.

And then to determine the direction, you put your hand, right hand, palm of your hand around that dot and then turn it. That will show the direction of magnetic field. So that's what the direction is showing on the left-side picture.

On the right-side picture, because the current is coming out, my thumb is in the current. So when I close it, I'm closing it counterclockwise. That's why the magnetic field are going that way.

Q Uh-huh.

A Now, if these two are placed close to one another, the magnetics from this is going to affect or induce or cross the other one, the one that's next to the -- the cable that's next to it. Then based on Faraday law.

Q I'm sorry, based on?

A Based on Faraday's law, the British scientist who came and said if you put something in the magnetic field that changes the magnetic field, there will be an induced voltage, which is equivalent to rate of change of that flux over time.

That creates a voltage that Mr. Lenz, the German scientist, came and say that voltage will be

opposite of the existing voltage and it will oppose the existing force, which is the current or the voltage in this.

So what's the effect of it? Drop voltage, extra drop voltage. Distortion of signals if it's a wire, it's like a control wire or other things. That's referred to in different terms: Cross induction, crosstalking, Faraday effect, induced voltage, reactive voltage, and so on and so forth.

Q Okay. So you're explaining that and using this figure that you took from the IEEE in the context of the 2014 NEC that required AC and DC cables to be separated in a hanging or support system, correct?

A This picture is here to demonstrate what that induction effect is and how it works.

Q Specifically between AC and DC cables?

A No. This is not specifically to AC and DC. This could happen within any current carrying cables. Any cable, any current carrying cable that has a magnetic field, AC/DC, AC and control signal, control wire, DC and data wire. Anything like that. It's a fundamental aspect.

Q Got it. Thank you.

You also say there on Page 15 right above

the figure, This is a function of current magnitude, materials, the physical properties of the cables and the distance between them.

That's what you were just explaining, correct?

A Correct.

Q Okay.

MR. FLYNN: Can we take half hour, 15 minutes, what do you want

(Recess from 1:09 p.m. to 1:52 p.m.)

Q (BY MR. FLYNN) Welcome back after the lunch break, Dr. Beik.

A Thank you.

Q Let me just ask you a couple of questions about your understanding about determining or assessing whether a patent and its claims are obvious.

What's your understanding as to how you determine the obviousness of claims in light of the prior art?

A If a claim is claiming or stating something that a POSITA would be able to figure out without the patent, it would have been obvious.

Q What do you mean by "figure out"?

A So I'll give an example. The wire

management systems in solar in electrical engineering is a known issue. So is cross induction. If I can find a solution like Carr or others and take that and modify it for solar, that would be an obvious choice to do.

Q Did you say if -- if you can find a solution --

A If there is a solution or if there is an apparatus out there that you can take and modify it, then apply it to that, then that issue can be resolved with that hanger; for instance, Carr.

Q So is your understanding, then, in determining [an obviousness, that it simply depends whether a POSITA can take a known solution and modify it to essentially arrive at the claimed invention?

A That's one of them.

Q What else?

A If there are things that is stated in the patent or the patent, it's obvious in terms of separating wires in a solar panel, creating a hanger that separates cable, say data from current carrier, known issue, there are other solutions out there that manage the wires. So it's not really inventing anything.

Q What's your understanding about

determining whether there is a motivation to combine references?

A For instance, if there is a solution here or part of a solution in this patent and part of a solution in another patent and it would be obvious to combine those to come to a conclusion, that combination would be obvious.

Q What would make it obvious to combine those things?

A The needs would make it obvious. Hangers need to hang from somewhere.

Q Is it just your understanding that a motivation to combine references, again, derives from the ability to combine those references to arrive at the claimed invention?

A It's not only the ability. It's the logical way of doing it. An obvious way of doing it is -- again, I'll give an example. You will take Carr. What is it hanging from? What do you have in solar that's hanging from? Messenger wire.

That's an obvious choice or obvious conclusion to hang, Carr, from a messenger wire, but you need to consider design factors like modifications or other parameters, installation, so on and so forth.

Q Does it matter to you normally whether a POSITA could modify or combine references but they also would have reason to do it?

A I'm not sure if I clearly understand that.

Q Do you take into account in your assessment not only whether a POSITA could modify a reference or combine references, but whether there would be reasons that he would do it, that he would modify or combine references?

A I think there are -- they are very much related. If you need to do something and then you have a reason to use it and there are options for it so you could use it, they are closely related in my view.

Q But would you agree that simply whether a POSITA could combine references isn't the end of the analysis as to whether there would be a motivation to combine those references?

A I'm not quite sure. What I would say is that if there are needs for it, you're motivated to do that. If you're not, there's no reason. If the cables are buried under the ground, you don't need to go and look at other solutions. You could but you don't need to, so you're not motivated.

But if you have aerial cables, be it a

hundred feet from the ground or two feet from the ground, then you have a motivation that I have to hang this. I need a hanger. Where does the hanger attach to? I need a structure.

So you're motivated to look for other solutions.

Q All right. Have I given you Almy already? I don't think I've given you the Almy, have I?

A No, sir.

Q Dr. Beik, we've provided you with a copy of Exhibit 1004, which is the Almy reference. You understand that Almy was a patent application, correct?

A Yes.

Q Do you know whether the application ever issued as a patent?

A I don't know.

Q Okay. The Almy is a Sunpower application, correct? Do you see where it's -- Sunpower is identified there on the front page of Almy?

A Yes.

Q Okay. Are you familiar with Sunpower?

A No, sir.

Q Almy -- the Almy reference refers to -- or is directed to a, wire-based hanging wire-way for

photovoltaic modules or module groups, correct?

A That's what it reads.

Q I think what I'd like to do is to have you look at Figure 6 of Almy, which may be the best way to go through what it is that Almy discloses.

You have -- you have analyzed Almy prior to today, correct?

A I have, sir.

Q Okay. You're familiar specifically with Figure 6 of Almy?

A I am familiar, yes.

Q All right. Figure 6 discloses module Groups 602, 604 and 606, correct?

A Correct.

Q And each of those module groups contains -- each of those module groups includes a plurality of solar panel or modules, correct?

A Correct.

Q And in Figure 6 of Almy, the module is depicted as 608, right?

A Yes.

Q And 608, each module includes a plurality of solar cells in that module?

A Yes.

Q Okay. Figure 6 also discloses DC cables

from -- extending from the various modules within each of the module Groups 602, 604 and 606, correct?

A Can you tell me where it says DC cables? Like which part says DC cables exactly? I can see there are cables. I'm just asking where it says DC.

Q Well, do you understand that these cables, which are the bundle of cables which is denoted 612 in Figure 6, they are coming from those solar panels, correct?

A I understand.

Q Does that not tell you that those -- that bundle of cables extending from the cells and the modules within the module groups are DC cables?

A It doesn't say on the picture. That's why I asked where it says.

Q Whether it says it or not, by looking at Figure 6 and understanding the Almy disclosure as a whole, do you not understand that those cables, 612, are the DC collector cables coming off of the solar panels or the modules?

A Purely looking at this, no. I can say DC is one type of cable that could down from this.

Q Again, not just referring to Figure 6. But based on your review of Almy as a whole, do you not understand that those would be DC cables?

A This is why I was just trying to ask you if you could point me to where it states. I would be in a better position to answer that.

Q If you look at page -- I mean on Paragraph 34 of Almy.

A Okay.

Q Paragraph 34 of Almy is specifically describing Figure 6, correct?

A Correct.

Q And it says that Each photovoltaic module group, 602, 604 and 606, has an associated electrical cable or bundle of electrical cables. Correct?

A Correct.

Q And it specifically refers to Bundle 612 being the bundle of electrical cables that is associated with module group 602?

A Correct.

Q And these cables are suspended in a plurality of wire-based hanging wire-ways, 614, 616 and 618, right?

A Correct.

Q And then it says, The electrical cables from photovoltaic module group 602, 604 and 606, are collected in combiner box 620.

Do you see that?

A Yes. At the end, yes.
Q Which connects the electrical cables in parallel, the combiner box?
A Does it say parallel?
Q The sentence that starts, The electrical cables from photovoltaic module group 602 --
Do you see that?
A Yes.
Q The electrical cables from photovoltaic module group 602, 604 and 606, are collected in combiner box 60 which connects the electrical cables in parallel.
Do you see that?
A Yes, sir.
Q And then a high current Line 622 couples combiner box 620, with an inverter 624.
Do you see that?
A Yes.
Q And inverter 624 combines line from several combiner boxes and converts DC current to AC current.
Do you see that?
A Yes, I see that.
Q Does that not tell you that the cables coming off of the solar -- of the module groups in

Figure 6 are DC cables?

A It does not. It says cables from 620 coming out is DC. A combiner box could have other cables, like sensor cables, coming down to them.

Q Century cables did you say?

A Sensory cables. You can have sensors sun sense, sun intensity sensors, humidity sensors or others in the cell imbedded that come down. They will not go to inverter.

What this reads, saying that DC is converted to AC by inverter. It does not specify cables coming down as being DC.

Q The only disclosure in Paragraph 34, would you agree, of the cables coming off the module groups are the cables that go into combiner box 620. Is that what you not understand Paragraph 34 to be saying?

A I understand that well, sir. But what comes out of 620 is described as an embodiment. End of your sentence -- end of this sentence, Inverter 624 combines lines from several combiner box and converts DC current to AC current.

There were no word here that says what those cables prior to that box are. This is talking about what an inverter does.

Q Let me try again.
A Sure.
Q The electrical cables from photovoltaic module group 602, 604 and 606 are collected in combiner box 620, right?
A Correct.
Q So the electrical cables from each of those three module groups are collected in the combiner box 620?
A Why are you assuming the electrical cables are DC cables, sir? There's never --
Q Would you put AC cables in a combiner box?
A As I explained, the --
Q No, stick to my question. Would you put AC cables into a combiner box?
A I don't know. If the --
Q Would you put signal wires into a combiner box?
A I don't know.
Q The only cables you would put into a combiner box are DC cables in a PV installation; isn't that correct?
A I don't know. That's your opinion. It does not say here.
Q So you don't know one way or the other?

A I am saying you're saying these are DC cables. I asked you, Where does it say DC?

It does not. A combiner box is a general term. You have it in the house. You may have it here that combines AC cables and the house all is AC cables, we have a combiner box.

Q And then the last sentence of Paragraph 34 says, Inverter 620 -- the combiner box -- let me back up.

The combiner box 620, connects the electrical cables in parallel --

That doesn't give you an idea we're talking about DC cables?

A The conclusion that I would make this is that you're saying these are only DC cables. I'm saying this does not specify that. There could be data sensor cables coming down.

Q Into the combiner box?

A It may not go to the combiners or it may go. Combiner box may have a control section and a current carrying cables section. I do not know.

Q But they wouldn't be in those wire-ways would they?

A What wire-way are you talking about?

Q Wire-way 614, 616 and 618.

A I don't know. This does not disclose that, sir. I am giving you what this is disclosing to a POSITA, which would be me. And being as accurate as I can.

Q And then it says, a high current line, 622, couples combiner box 620 with an inverter 624, right?

A Correct.

Q And then inverter 624 combines lines from several combiner boxes and converts DC current to AC current, correct?

A That's what it reads.

Q And isn't that telling you that the cables that are going into the combiner box and being combined, and then being converted to AC are DC cables?

A What this is telling me is that the combiner box output to the inverter is DC. The other cables, DC would be a -- one of those types. But does it have other cables? It doesn't explain here.

Q Are there -- you can see from Figure 6 --

A Uh-huh.

Q -- are there any cables coming off of module group 602, 604, 606 that are not collector cables? Do you see collector cables?

A I don't know. This doesn't say -- doesn't explain to me. It's just showing a line. It's a cable. How -- this line could be a combination of three cables. I don't know.

I am merely going based on what this figure and what this says. Your conclusion, I don't agree with it that this -- the only thing that this could be is DC.

Q Okay. So you think that the cables coming off of each one of these module groups could be DC, AC and data cables?

A Likely not AC. Because the solar panels don't generate and I don't see a motor in this one. Likely not AC.

Q But likely data cables?

A I'm just saying there is a possibility. I don't know. Those cells or modules that they are connected together, where is their data cable or sensor cable? I don't see them. Is it combining that line? I don't know. Does this explain? It doesn't.

So a POSITA -- this field is highly technical. And I'm being as technical as I can.

Q As disclosed in Almy, what would be the purpose of the data cables if data cables were

included in the cables coming off of the solar module groups?

A I don't want to speculate. I do not know.

Q So you don't know whether they are included in the cables coming off the module groups and if they were, you don't know what the purpose of those data cables would be?

A It's sensor cables. So measuring sunlight, measuring humidity, measuring the health of the cell. Is it healthy or what's the health of the cell? So those could be sensor cables. It's one of the possibilities.

Q Is there any disclosure that you see in Almy that suggests that the cables coming off of the module group 602, 604, 606, include data cables?

A Not that I recall.

Q You're just saying what could be possible.

A I'm just saying, is the sentence you read to me and you're asking me, These must be DC. And I'm telling you as an expert in this field, I can't make the same conclusion that you're coming to based on Paragraph 34 and Figure 6.

Q Would you look at Figure 2A and 2B of Almy, please. Figures 2A and 2B of Almy, would you agree, are disclosing the wire loops that bundle the

cables coming off of the module groups, 602, 604 and 606, correct?

A Correct.

Q Is it your belief that what's shown in the wire loops, 204A and 204B, could be differing kinds of cables?

A It would not be a normal practice.

Q Would the normal practice -- would the normal practice be that the cables that are shown being supported by wire loops 204A and 204B are all DC cables?

A It could be all DC cables.

Q That would be normal practice as shown in Almy?

A One of the normal practices or it could be all data cables or all AC cables.

Q So is it your testimony that the electrical cables coming off of solar module group, 602, 604 and 606, in Figure 6 and going through this hanging wire-way that includes these wire loops could be all data cables?

A What comes out of 602, 604 and 606, if they are DC cables, this would be all DC cables. If they are DC cables and data cables or sensor cables, you would separate them perhaps at that box or

somewhere else and would send the DC bunch through a hanger like this for DC and data to a different hanger because this hanger doesn't offer separation.

Q So even if there are data cables coming off of solar module group 602, 604 and 606, they will not be in the same wire loop.

A It should not be.

Q So you assume, then, that what's in wire loop 204 and -- 204A and 204B if they're only DC cables coming off of the solar module groups, they're all DC cables. If they're DC and data cables coming off the solar module groups, then in one wire loop there might be the DC cables and in the other wire loop, the data cables?

A That's one option.

Q But you wouldn't bundle -- Almy wouldn't be disclosing DC cables and data cables bundled in the same wire loop?

A That's -- it's not a normal practice. It doesn't -- not based on NEC code. Based on the induction effect in IEEE that I discussed, you would not do that.

Q So because if you put the data cables in the same wire loop as the DC cables, you have that cross induction effect issue again, correct?

A In switching and transients, yes.

Q I'm talking about if you put DC cables and data cables in the same wire loop, you have a concern about that cross induction effect, even in the absence of switching and transients, don't you?

A If it's pure ideal DC current, there is no induction. The derivative of flux over time --

(Reporter clarification.)

A If it's a pure DC current with no change, the derivative of the flux over time will be zero. There will be no induction.

But since you -- this figure is disclosing inverter 624, there will be transients. So the DC will have transients. So there will be cross induction.

Q (BY MR. FLYNN) Where will the transients occur in Figure 6?

A I discussed in length, that's coming from the switches. The power electronic switches in the inverter that travels back in the DC wire.

Q And it would travel -- the transients would travel from that point where the switches are at the inverter, onward?

A Both towards the AC and DC. How long depends on the switching frequency, the current and

so on.

Q Dr. Beik, let me ask you this: If these were only DC cables in wire loops 204 and 20 -- in wire loops 204A and 204B, if they were only DC cables bundled together in those wire loops, would there be any need to separate them because of cross induction?

A Since there are transients, you will separate them.

Q That's your testimony, that you would separate DC cables because of those transients that you've talked about?

A Because of the cross induction. The cross induction happens when the flux, the magnetic field varies. That was proven a hundred years ago by a scientist called Faraday.

If it's -- take transformers in power system, go outside your house, connect DC to it. You will smell a strong smell of burned. Why? Because transformer works based on law of induction of Faraday. DC current, connect a battery to it, is DC, doesn't change. It will burn the wires.

Q So is it your testimony, then, that if you have all of DC -- the -- only DC cables in wire loops 204A and 204B, that there's still a need to separate those DC cables to prevent cross induction effect?

A From data cables. Because you have transients in power system, you have switching effects.

Q You said from data cables. But I'm saying if the wire loops only have DC cables in the wire loops, not data cables --

A Oh, then that's fine.

Q Okay. That's what I'm asking. Maybe we just had a mis- --

A Okay.

Q -- communication?

A So 248 -- let me maybe clear. If all the same type, you don't need to separate them.

Q So if all the cables in wire loop 204A and 204B are the same type of cables, DC cables --

A You wouldn't.

Q -- you don't need to separate them to prevent cross induction?

A Not -- no, not normally.

Q Thank you.

Dr. Beik, if you will turn, please, to Paragraph 96 of your declaration, it talks about motivation to combine Carr and Almy.

A Okay.

Q Actually, the Motivation to Combine

section of your declaration extends from Paragraphs 96 through 99.

As I understand what you were stating in these paragraphs is that a person of ordinary skill in the art would have been motivated to combine Carr and Almy by replacing Almy's wire loops with Carr's hangers to avoid or prevent the cross induction effect?

A Can you tell me where it says that, if you could, please.

Q Well, please read -- if you would, please, read those paragraphs. I'm trying to summarize those three paragraphs. And if that's not a fair summarizations, please tell me how to correct it.

A So can you -- okay. I thought you were reading from this.

Q No, no, no. I'm sorry.

A So can you repeat your summary, please.

Q Sure.

So as I understand Paragraphs 96 through 99, four paragraphs, you are expressing an opinion in this section of your declaration that a person of ordinary skill in the art would have been motivated to combine Carr and Almy to replace Almy's wire loops with Carr's hanger to prevent cross

induction effect?

A Separation of the wires, yes.

Q Didn't you say again in Paragraph 98, separation of different types of cables, such as data from current-carrying cables, correct?

A If you could please kindly tell me where it's --

Q Paragraph 98.

A 98. Okay.

Q Down towards the bottom of that paragraph.

Additionally, separation of different types of cable such as data from current-carrying cables.

A Correct.

Q And that would be the motivation to combine, of a person of ordinary skill in the art to use -- to replace Almy's wire loop with Carr's hanger to separate different types of cables to prevent cross induction effect?

A That is correct.

Q Okay. In Paragraph 98, you also state that Combining Carr and Almy by replacing Almy's wire loop with Carr's hanger would implement a more robust hanger.

Do you see that?

A 98?
Q Yes.
A Yes, I see that.
Q When you say "a more robust hanger," do you mean that Carr's hanger would be a more robust hanger than Almy's wire loop?
A You can make wire loops a robust structure. You can increase their thickness. You can change the material.
That sentence is referring to a solution that it's robust and it also provides that separation of different types of wires.
Q But that's not saying that Carr's hanger would be a more robust hanger than Almy's wire loop?
A Generally, no. If -- you can make Carr as strong as -- Almy as strong as you want or Carr as strong as you want.
Q Okay. Almy is teaching that its wire-based hanging wire-way system is actually an improvement over things like cable ties and zip ties, correct?
A That is correct.
Q Dr. Beik, have you reviewed Dr. Kern's declaration in this IPR?
A I have looked at it, analyzed it to some

extent.

Q Thank you for that.

When you say "to some extent," have you analyzed the entire declaration?

A I understand the arguments and analyzed it.

Q Okay. Would you please turn to Paragraph 34 of Dr. Kern's declaration, which is on Page 16. It begins on Page 16.

Dr. Kern refers to the unique nature of power collection and aggregation in solar PV facilities that introduced novel constraints and challenges in wire and cable design, management and organization not arising in other fields and industries.

Do you see that?

A I do.

Q Do you agree with that?

A No.

Q Why do you not agree with that? What's the basis of your disagreement with that?

A Do you drive an electric car? Have you driven, ever, electric car? Are you familiar with electric car? The battery packs are DC, but they all have sensors. So there is wire coming out of those

that is power, and it's very high power and data cables or sensors.

A solar panel is DC. Sensors comes out of that. Further, you have AC motors in solar panel for tracking. You have significantly stronger AC motors in electrical. You have AC, DC, data in cars, electric cars.

I can give you further examples if you want.

Q So if I understand what you're saying, you're saying in the electric car application, you have the same kind of electrical cables as you do in solar installations, DC, AC, data cables?

A Type, not the same.

Q The same type of cables?

A Similar types.

Q And, therefore, because you have same or similar types of cables in electric cars than you do in PV installations, there would be no challenge in managing those kinds of cables in a PV installation that you wouldn't also have in an electric car application?

A I don't believe I said that, sir.

Q Well, I'm asking --

A You said, Do you agree with this? I said,

I don't agree.

It says, novel challenges. I don't think there's anything novel about that. As a matter of fact, 1945 patent says there's nothing novel about that.

The only reason you separate that in a solar panel is crosstalk, cross induction. In 1945 and before that, people knew. So there is nothing novel about it.

Q I think I understand what you're saying. So what you're -- what you're identifying as the challenges or what you believe that Dr. Kern is referring to as the challenges, you're identifying as the crosstalk or the cross induction?

A That's one of them. It's cable management system. It's nothing novel about that. You need to apply sound support -- sound engineering principles supported by analysis and standards to solve those issues. If you come up with a creative approach, there is nothing novel about it, sir.

Q Are you aware of any challenges unique to solar with respect to cable management that you might not have in the application of an electric car?

A One of the challenges that's also common in wind turbines and wind farm is that when the size

increases, when you have -- instead of 20 you have 170 wind turbines or solar panels, the number of cables merely increases. Again, nothing novel. Or household distribution systems and so on.

Q Can you think of any challenges with respect to cable management in PV installations that are unique to PV installations?

A I can't think of off top of my head if there are.

Q Okay.

A You can point out to me and we will discuss.

Q If you would turn to Paragraph 48 of Dr. Kern's declaration, which begins on Page 21.

And it's under the heading of The Need for Improved Systems for Cable Management.

And this is specifically referring to NPV installations; is that correct?

A That's what I understand from this.

Q I assume this Section C and the paragraphs that follow with respect to the need for improved systems for cable management were among those portions of his declaration that you analyzed?

A Yes.

Q Is there anything in this section that you

disagreed what Dr. Kern described about the need for improvements in cable management and solar installations?

A This is -- this problem stated is nothing more than a sound engineering principle. It says requires innovations. I don't know what it's referring to.

Cable management existed. Cable hangers existed. This is a common practice.

Q Would you turn to Paragraph 57, please.

Is Paragraph 57 a paragraph of Dr. Kern's declaration that you have read before?

A I have.

Q Is there anything in Paragraph 57 that you agree or disagree with Dr. Kern about?

A I cannot know when it says, Prior to 2000 there were significant industry investments in solar module and power electronics manufacturing but little, if any, in solar structures and wiring.

I don't know where. There's no reference to it. I don't know.

The period from 2000 leading up to the time of the patent, to '291 patent, saw some PV module industry investment in structures to support PV modules.

I don't know about that. I have no way of verifying it.

But there were -- there was still the expectation within the industry that wire management for solar installation would simply involve selection and application of existing methods and equipment.

There are historic data in this referring that I don't know. There's no way for me to verify without a reference.

Q And you don't know one way or the other whether you can agree or disagree with that based upon your own work or your own research in your fields?

A When we added tracking systems and sensors to solar PVs to increase their efficiency in terms of output of power, the number of cables increased. When, over time, we increased our solar farms from a couple of hundred kilowatts to megawatts or higher, the number of cables increases.

So there is logical things that we can conclude as engineers. But the timeline that's provided here, I can't -- I wouldn't know.

Q Okay. Paragraph 58 of Dr. Kern's declaration referring to the unique challenges in PV installations says, Some of these unique challenges

are discussed in an article from an early 2013 article in a leading trade industry publication SolarPro Magazine, entitled PV Array Wire Management, which is an exhibit introduced by petitioner in these proceedings, Exhibit 1011.

Do you see that?

A I do.

Q Are you familiar with SolarPro Magazine?

A Not prior to this petition.

Q Okay. Prior to this -- these IPR proceedings, were you familiar with any industry publications, solar industry trade publications?

A We have a magazine. It's called IEEE, Electrification Magazine --

(Reporter clarification.)

A IEEE, I triple E, which I also have published in it. That has existed for decades.

Q (BY MR. FLYNN) But that's more than just solar, right?

A It's electrification. Solar, wind, anything that deals with electrical and electrification.

Q Are you familiar with any other trade industry publications that deal specifically and only with solar?

A There was a journal on solar. I cannot recall. I was an associate engineer for a while. It was a long time ago, that it's exclusively solar. I could look into it and give you an example when I get time.

Q But SolarPro was not one of those trade industry publications that you recognized?

A I did not know them before, no.

Q Dr. Beik, at Paragraph 171 of your declaration, that paragraph begins with section of Considerations of Non-Obviousness, correct?

A Correct, sir.

Q It's your opinion, as I understand it, that there are no secondary considerations of non-obviousness with respect to the '291 patent invention that would be contrary to your opinion that the '291 patent is obvious?

A I did not see anything like that.

Q Did you do anything to look?

A There was in the prosecution history something.

Q Do you remember what that was?

A It was a sales number.

Q Other than looking at the prosecution history and the sales number within the prosecution

history, did you do anything else to investigate whether there might be any secondary considerations of non-obviousness?

A I reviewed the material that's in the IPR and petition.

Q So was that SolarPro article -- give it to me, please.

We're handing you Exhibit 1011 in this IPR, which is the SolarPro article from 2013. Is this one of the articles that you had reviewed?

A Yes.

Q Or one of the materials that you had reviewed as part of the IPR proceedings?

A Yes.

Q So other than the prosecution history that referenced sales figures and this SolarPro article that's Exhibit 1011, did you review anything else or analyze anything else with respect to the issue of secondary considerations of non-obviousness?

A I may have done some Google search and research to see other things. And I can't remember -- I don't recall what exactly I've looked at.

Q Okay. You actually cited to this SolarPro article in your declaration, correct?

A I believe so.

Q If you go to Paragraph 33 of your declaration. And the portion of Paragraph 33 is on Page 16, the next page. And you reference in about the middle of that portion of the paragraph, For example, a 2013 article.

Do you see that?

A Yes.

Q A 2013 article in SolarPro explains that wire ties are not a permanent answer and require regular inspection and replacement and therefore should be avoided.

Do you see that?

A Correct.

Q That's the only place in your declaration that you cited to this solar pro article; is that right?

A It may have been.

Q And that's the only proposition that you cited it for is with respect to wire ties not being a permanent answer.

A That's only with respect to that, yes.

Q The SolarPro article on the very first page of the article at the very bottom of it.

A Okay.

Q It says, in the second sentence, Designers and installers face persistent challenges to many free-air conductors within the PV array.

Do you see that?

A Can you point that to me?

Q Here. Down here.

A Oh, yeah. Okay.

Q Do you see that?

A I do see it.

Q Is that something you recall having reviewed or read or analyzed when you were preparing your declaration?

A I have. I've looked at some other that it's talking about hangers within this. I'm just trying to find where that says.

Q I'm going to help you. I'm going to point some things out to you.

A Uh-huh.

Q The very top line on the next page it says, Implementing a safe, reliable and Code-compliant wire management system for exposed PV conductors is not an easy task.

Do you see that?

A Yes.

Q And you see, then, in the paragraph that

starts with, Unfortunately --

A Yes.

Q -- the PV industry lacks consistent, standardized wire management solutions for free-air conductors within the array. Coupled with the harsh environmental conditions that PV array conductors are exposed to -- UV radiation, high winds and extreme ambient temperatures, and ice, snow and other debris --

Do you see that?

A I do.

Q Does that identify for you some unique challenges to cable management and wire management in PV installations?

A As the size of the farms increase, it is obvious that it is a challenge --

(Reporter clarification.)

A -- it is obvious that it is a challenge to manage cables.

Q (BY MR. FLYNN) And do you agree that harsh environmental conditions, such as UV radiation, high winds, extreme ambient temperatures, ice, snow and other debris present unique challenges to wire management that might not exist, for example, in electric vehicles?

A I don't agree that this is for solar PVs.
Q I'm sorry, you don't agree what?
A I don't agree that this is just for solar PV. You have that in power grid. There is a storm. Cables in wind farm, in any distribution grid.
Q Do you see where it then says, Wire management continues to be the Achilles heel of the majority of PV installations?
A I read this, sir, yes.
Q On the next page it talks about -- it actually is quoting of one of the senior research engineers at the Institute for Energy and the Environment at New Mexico State University, Mr. Whales, John Wiles.

And you see he refers to -- where he says, Before we even start with NEC requirements of array wire management, we must address the fact that the outdoor environment that exposed PV conductors must survive is one of the most difficult environments that any electrical system will face outside of utility transmission systems.

Do you see that?
A I see this.
Q And then he also refers, then, down below to the temperature ranges that may range from

negative 60-degree Celsius to plus 90 degrees Celsius and UV irradiance that may exceed 2000 hours per year.

Do you see that?

A I see this.

Q And, Winds and gusts of 90 to 130 miles per hour are not uncommon.

You see that as well?

A I see.

Q Do you not view these kind of challenges as presenting obstacles to using above-ground cable management in solar installations that use hangers suspended from messenger cables to support electrical cables coming off of the solar panels?

A This is what we face on a daily, monthly, yearly basis on the electric power grids. Let's go outside. Tomorrow the temperature will be 90 degrees, high winds. We have -- like what's specific that that solar farm is experiencing, that power grid does not. Let's go to offshore wind farm on the East Coast off of coast of Boston. The wind is 3, 4 times stronger than what it is in Nevada on solar panels. The humidity is significantly higher.

So when this statement says, most difficult environment that any electrical system

would face outside of utility, I challenge to go to ten experts and see if they can say the same thing about solar PV.

These issues are common, sir. There is nothing that -- is it a challenge? Absolutely. Everything is a challenge. Creating the electric vehicle is a challenge. Create -- eliminating harmonics in power systems is a challenge. Everything is a challenge.

Q But you -- I'm sorry.

A I want to just finish up. This does not tell me -- first, I don't agree with this statement that says it's most difficult. I would challenge that person go to a wind farm. Go to -- come to Colorado this week, next day, or a couple of days, it's going to get to 85 degrees. And in the winter it's going to get extremely cold.

Like, I mean, there is nothing that -- these are normal challenges everyday engineers face to solve the issues.

Q I think when I asked you before about whether you had -- whether you have ever seen a solar installation that used above-ground messenger wire supported cable management system that used hangers suspended from a messenger wire and the hanger

supporting the electrical cables is extending from the solar panels, and you had said no, you had never seen one before this litigation, correct?

MR. DIXON: Objection to form.

Q (BY MR. FLYNN) Is that correct? Did I state that accurately?

A I have not been to a solar farm. That's the accurate statement.

Q And you -- but is it also not accurate that you've never seen, whether you've been to a solar farm or not, that you have not seen elsewhere -- either on any website or on any product offerings -- you've never seen a cable management system in a PV installation that used hangers suspended from a messenger wire to support electrical cables extending from the solar panels?

MR. DIXON: Objection to form.

A I believe my answer to that was I don't remember. And my answer stays the same.

Q (BY MR. FLYNN) If you go to -- I don't know about on your copy, but on my copy if there were page numbers they got obliterated -- but it's the fourth page of this article.

A Okay.

Q About halfway down where it says, Besides

squirrels.

Do you see that?

A I do, sir.

Q Besides squirrels, the biggest issue we face is a recreate the wheel approach at every site as we strive to meet NEC requirements while installing systems that will last 25 years.

Do you see that?

A I do.

Q Are you aware of any challenges as the solar installations grew bigger and bigger of performing cable management that would comply with NEC requirements?

A I'm not sure if I understood that. Can you repeat it?

Q Are you aware of whether there was any concern that cable management systems in solar installations, and particularly above-ground cable management systems that used hangers suspended from a messenger wire, could meet or comply with NEC requirements?

A This does. Carr does. It doesn't have to be solar.

Q That wasn't quite my question.

My question -- I'll try it again -- is

whether you were aware or are aware whether cable management in PV installations caused concerns with complying with NEC requirements, particularly above-ground messenger-supported cable management systems, whether there was any concern that that kind of a cable management system would comply with NEC requirements?

MR. DIXON: Objection to form.

A Do I know an example? I'm an expert in this field. I know these exist. It existed always in distribution. Solar panel, it uses the same type of cable. We are not talking about a cable that's specific for solar. AC, DC, any other.

So would I -- have I seen a specific example? I don't remember. But would I come to the same conclusion? Always.

Q (BY MR. FLYNN) Are you specifically aware of whether there were any concerns about cable management systems in PV installations being able to comply with NEC requirements? I'm just asking about PV installations.

A And I don't remember specific examples, but I come to the same conclusion always; that cable, when the systems increase, number of batteries increase, number of wind turbines increase, number of

customers increase in distribution grid. Cable management system is always an issue.

It's not anything novel. It's not something that oh -- it's, Oh, my God, I found out this today. It's something that it has always existed in electrical power systems.

Q In Paragraph 172 of your declaration, In my opinion the '291 patent did not resolve any long-felt need.

Do you see that? I'm sorry.

A No. It's okay.

Yes, sir, I see it.

Q You've just looked at some of the sections or portions of the SolarPro article, Exhibit 1011, that talked about the need for improvement in PV cable management systems, right?

A Yes.

Q Does that not indicate to you that, in fact, there was a long-felt need for improvement in cable management systems in PV installations?

A Of course not.

Q You don't believe that there was a long-felt need for that?

A Absolutely not. Is there a need? Absolutely is. It is a challenge? Of course.

Anything is a challenge as an engineer, to do it economically, technically correct.

And my answer was, What's special about solar than a wind farm, than a utility grid, a distribution system that you need -- you have telecommunications cables, you have types of cables. You have to manage them. There's nothing long felt about it.

I use that word, I'll use it again, it's nothing that, Oh, I'm surprised.

Q Okay. Whether similar needs existed in other industries --

A Yes.

Q -- would you agree that there was a long-felt need in the solar industry for improvement in cable management systems, like the SolarPro article discusses?

A Absolutely not, sir.

Q Okay. In Paragraph 173 of your declaration you indicate that you're not aware of any secondary considerations consisting of commercial success.

Do you see that?

A I see it.

Q Now, you mentioned a moment ago that when

you reviewed the prosecution history, you saw some reference to sales figures.

A I saw that.

Q Did that not occur to you that that was some evidence of secondary considerations, specifically commercial success?

A I did not see any ties from that sales to this patent, or to '291 patent. It did not show any of those.

Q Okay. You also say that you didn't -- you're not aware of any secondary considerations evidence of copying, in Paragraph 173.

A Correct.

Q And you haven't seen anybody trying to copy the hangers or the system that AWM -- that CAB has come up with?

A When I looked at CAB and I looked at Carr I -- my conclusion was, what is different in this? Answering the same question, the same issue in this. So I -- no. The answer to your question is no.

Q So did -- are you saying that you essentially looked at CAB as copying Carr?

A It's not copying, but there is nothing -- I would be motivated -- a POSITA would have been motivated to take Carr, a messenger wire from, for

instance, Almy, come to the same conclusion.

Q My question to you, though, was whether you have seen any evidence that any other person or competitor in the solar industry copied the messenger wire supported cable hanger management system that CAB has implemented and that is covered in the '291 patent?

A I have not.

Q Have you seen AWM's cable management system using a messenger wire and hangers suspended from the messenger wire to support electrical cables extending from solar panels?

A At -- when I was doing my declaration, I've looked at their website.

Q And did you see the system that they use, the cable management system that they use with their messenger wire and their hangers? Have you seen that?

A I saw what was on their website.

Q Is that the extent of what you have seen of AWM's cable management system, what's on their website?

A Yes.

Q And did you believe that that is the same kind of cable management system that CAB has

implemented from what you saw on CAB's website?

A Like copying exactly the same? No. It's a cable management system like Carr is a cable management system, like Caveney is a cable management system.

Q What differences have you noted between AWM's cable management system and CAB's management system?

A I have not looked into that, sir.

Q You saw CAB's cable management system on its website, right?

A That's it. I have not analyzed it against CAB or any other products.

Q Okay. You also said in Paragraph 172 that you're not aware of any industry recognition or praise regarding the claimed invention of the '291 patent, correct?

A Uh-huh. Yes.

Q Are you aware of any recognition or praise that CAB's cable management system has received?

A I am not familiar with that.

Q You have not seen any awards presented to them or other types of accolades for the innovation of their cable management system?

A I've not looked into them, sir.

Q If you were aware of evidence of industry praise or recognition or accolades for their innovation, if you were aware of commercial success that was specifically tied to the '291 patent invention, if you were aware of copying, if that kind of evidence became available to you, would that change your opinion as to whether there were secondary considerations that would dictate against a finding of obviousness?

MR. DIXON: Objection to form.

A That's a hypothetical question. I don't know the answer. I can't engage into that conversation.

Q (BY MR. FLYNN) Well, I ask because you say that in Paragraph 173 -- the last sentence of Paragraph 173 you say, Even if second -- evidence of secondary considerations existed, in my opinion it would be insufficient to overcome the clear obviousness of the challenged claims.

Do you see that?

A I do.

Q So unaware of any evidence of secondary considerations that we've just gone through, it wouldn't make any difference even if those things did exist. You've already stated your opinion it

wouldn't overcome the obviousness of the '291 patent.

A Patent '291, it's a simple solution that a POSITA would have known looking at the prior art. There is nothing innovative. There is nothing long felt. There is nothing that would prevent a POSITA to come to the same conclusion of what function that hanger does based on simply the evidence that existed since 1945. That's Number 1.

Number 2 is that for commercial success or others, I have not -- I did not see anything tying that commercial success if it existed to this, but it would not have mattered because simply this is a -- this is a solution -- a simple solution to a -- to something that already existed.

Q Does a simple solution prevent it from being innovative?

A Not necessarily. But when there are solutions that satisfy the needs that have been proven and have been decades-long existent to the same problem, how can that be a patent?

If you take a device from aerospace and modify it, put it in power grid doing the same thing, how can -- how could one -- how could that claim to a patent when it's obvious to the POSITA that I need a hanger, I need to separate them, I a need a messenger

wire to hang the hanger from the messenger wire.

Every single indication, sir, that is in this, I read the patent, a POSITA would come -- would find these solutions.

Q And yet nobody did before CAB came up with it.

A I wholeheartedly disagree with you. And the reason is because nobody goes and publishes about cable, like hangers. It's such a known thing. People publish on the state of the art. You showed me the book and you grilled it. Of course I didn't talk about hangers because it existed since '45.

What I talk, what people publish on is the state of the art. Hanger, decades old and there is nothing innovative on it.

First of all, I don't know if something doesn't exist. Maybe there's no publications. I don't know. If you're going around other countries, other places even in the U.S. you might find answers but it's nothing to publish on.

Q So back to my question about the secondary considerations evidence. You are confirming your opinion, as you stated in Paragraph 173, there is no amount of secondary considerations evidence of non-obviousness that would change your opinion that

the claims of the '291 patent are invalid as obvious?

A They are clearly obvious to a POSITA.

Q Give me just a couple minutes to look over our notes and we may be, if not finished, very close to finished.

(Recess from 3:13 p.m. to 3:19 p.m.)

MR. FLYNN: My colleagues have advised me that I have already gone on too long, so I have no further questions for you today. Thanks.

THE DEPONENT: Thank you.

EXAMINATION

BY MR. DIXON:

Q I just have a couple questions for redirect.

If you could go to your declaration, Exhibit 1002, and turn to Page 8, please.

A Okay.

Q Do you see Paragraphs 20, 21, 22, 23, 24 and 25?

A I see them.

Q And that's under Section 4, Legal Standard, correct?

A Yes.

Q Did you apply these legal standards in offering your opinions in this matter?

A I have.

Q And now if we go to Page 19 of the same exhibit and look at Paragraph 39, do you recall discussing the sentence in Paragraph 39, The '291 patent is directed to a locking cable hanger and multiple cable carriers or saddles on one hanger which can be used in the solar, mining, and electrical industries?

A Sorry, I didn't understand. What was your question?

Q Do you recall being asked questions --

A Oh, yes.

Q -- on that sentence?

A From Mr. Flynn, yes.

Q Do you recall the citation there to Exhibit 1001, 2, colon, 19 through 20?

A I do remember. I don't know where the exhibit is. Okay.

Q And do you recall Mr. Flynn characterizing this sentence here as being an inaccurate quotation of Exhibit 1001?

A Yes, I do.

MR. FLYNN: Did you say colon, 2, 19 through 20?

MR. DIXON: Yes. Well, let me back up and

re-ask the question.

Q (BY MR. DIXON) Do you recall the -- Mr. Flynn characterizing this citation, Exhibit 1001, 118 to 19, 219 to 20 as -- let me rephrase that.

Do you recall this sentence in Paragraph 39 being called a mischaracterization?

MR. FLYNN: Objection to form.

MR. DIXON: Yeah. Thanks. Sometimes those are helpful.

Q (BY MR. DIXON) Do you recall Mr. Flynn characterizing this sentence as misquoting Exhibit 1001 at Column 1, Lines 18 through 19 and Column 2, Lines 19 through 20?

A Yes.

Q If you turn to Exhibit 1001, Column 3, 19 through 20, do you see the sentence that says, This invention has to do with a locking cable hanger and multiple cable carriers or saddles on one hanger?

A Yes.

Q Is that reflected in the first portion of this sentence in Paragraph 39 we've been talking about?

MR. FLYNN: Object to form.

A Yes. That sentence is from that section. It appears that there is a typo in my declaration.

Q (BY MR. DIXON) If you were to correct the citation for the sentence we've been discussing, how would you correct the citation?

A Just go to Column 3, the quotation would be the same.

Q Now, if we go to the institution decision, Page 15.

A Okay.

Q Do you recall being asked whether Exhibit 1003, also known as Caveney, discloses only interior preexisting building structures?

A I was asked about that, yes.

Q So looking at Page 15 of the institution decision, do you see on the very first sentence on this page the board is stating, Caveney's multitiered cable supports 30 support high performance cabling used in the telecommunications industry by attaching to preexisting building structures, such as I-beams, joists, ceilings and walls, and also by attaching to fixed brackets, such as ladder rack bracket, 38, using fasteners?

A Yes, I see this.

Q You disagree with that statement, right?

A Yes. I do.

Q Do you see the citation, Exhibit 1003,

Column 1, Lines 5 through 10; Column 2, Lines 65 through Column 3, Line 25; Column 4, Line 5 through 40; and then Figures 1, 3 through 7, 10 through 13, and 20 through 22?

A I see this.

Q Can you please take a look at Exhibit 1003 and review the board's citations?

A May I ask if this is Caveney?

Q Yes, that's right.

A I have looked at them.

Q Do any of the excerpts cited by the board on Page 15 of its institution decision use the word "preexisting"?

A In the patent?

Q In Exhibit 1003.

A I could not find.

Q Do any of the excerpts in the board's citation to Exhibit 1003 on Page 15 of its institution decision refer to a building?

A I could not find it.

Q Do any of the excerpts in the board's citation to Exhibit 1003 on Page 15 of its institution decision refer to being inside?

A I could not find it.

Q So in reviewing all of these excerpts that

the board relied on on Page 15 of its institution decision, would you have any reason to believe that Caveney discloses only interior preexisting structures?

A No. And that was my answer at the beginning. I do not believe these are meant only for inside buildings. There is no mention of them in these, this exhibit, in these words, cited.

MR. DIXON: Thank you, Dr. Beik. I have no further questions.

MR. FLYNN: Nothing more for me. Thank you.

(A discussion was held off the record.)

MR. FLYNN: I do want the expedited, whatever we ordered, for this.

THE COURT REPORTER: Yes.

(A discussion was held off the record.)

MR. FLYNN: For Exhibit 2005, which is Dr. Beik's coauthored book, Wind and Solar Power Systems for -- initially for purposes of preparing the exhibit, we're only going to copy the cover of the book up to Introduction.

But because Dr. Beik referred to various sections and chapters of the book, if it turns out that we want to or need to specifically cite to

sections that Dr. Beik mentioned, we will cite to those sections that he mentioned in our Patent Owner response or expert declaration or whatever, we will supplement the exhibit to include pages that cover those additionally cited portions.

Is that good?

MR. DIXON: And as the petitioner, we'll also reserve the right to cite to those sections that he mentioned as well, to the extent necessary to provide context.

MR. FLYNN: Sure. Okay.

THE COURT REPORTER: And then did you also want an expedited copy of your transcript in addition to your rough, or just the rough?

MR. DIXON: I think just the rough is fine.

(A discussion was held off the record.)

MR. MELMAN: Let's get a rough. Thank you.

WHEREUPON, the within proceedings were concluded at the approximate hour of 3:34 p.m. on July 9, 2024.

* * * * * *

I, OMID BEIK, do hereby certify that I have read the foregoing transcript and that the same and accompanying amendment sheets, if any, constitute a true and complete record of my testimony.

_____
Signature of Deponent

( ) No Amendments
( ) Amendments Attached

Acknowledged before me this

_____ day of _____, 2024.

Notary Public:_____

My commission expires_____

Seal:

BJD

STATE OF COLORADO)

) ss. REPORTER'S CERTIFICATE

COUNTY OF DENVER)

I, Barbara J. Davalos, do hereby certify that I am a Registered Merit Reporter and Certified Realtime Reporter within and for the State of Colorado; that previous to the commencement of the examination the deponent was duly sworn to testify to the truth.

I further certify that this deposition was taken in shorthand by me at the time and place herein set forth, that it was thereafter reduced to typewritten form, and that the foregoing constitutes a true and correct transcript.

I further certify that I am not related to, employed by, nor of counsel for any of the parties or attorneys herein, nor otherwise interested in the result of the within action.

In witness whereof, I have affixed my signature this 12th day of July, 2024.



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In the Matter Of:

Affordable Wire Mgmt. vs

Cambria County Assoc. for the Blind and Handicapped

OMID BEIK, PH.D.

July 11, 2024



UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

IPR2024-00139, Patent 10,177,551

DEPOSITION OF OMID BEIK, VOLUME II
July 11, 2024

AFFORDABLE WIRE MANAGEMENT, LLC,

Petitioner,

vs.

CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED, INC.,

Patent Owner.

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Pursuant to Notice and the Federal Rules of Civil Procedure, the deposition of OMID BEIK, VOLUME II, called by Patent Owner, was taken on Thursday, July 11, 2024, commencing at 9:30 a.m., at 216 16th Street, Suite 600, Denver, Colorado, before Barbara J. Davalos, Registered Merit Reporter and Certified Realtime Reporter within and for the State of Colorado.

I N D E X

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EXHIBIT	DESCRIPTION	INITIAL	REFERENCE
Exhibit 2005	Excerpt from CAB Installation Guide		59
Exhibit 2006	Exhibit A, Ex1005, Case No. IPR2024-00139		171
Exhibit 2007	Exhibit B, EX1006, Case No. IPR2024-00139		171

PREVIOUSLY MARKED EXHIBITS

Exhibit 1001	United States Patent 10,177,551		41
Exhibit 1002	Declaration of Omid Beik, IPR2024-00139, Patent 10,177,551		6
Exhibit 1003	United States Patent 10,003,298		13
Exhibit 1004	Petersen reference		132
Exhibit 1005	Exhibit A, EX1005, Case No. IPR2024-00139		100
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Exhibit 1007	Excerpts from NEC 2008	13
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P R O C E E D I N G S

OMID BEIK,

being first duly sworn in the above cause, was examined and testified as follows:

EXAMINATION

BY MR. FLYNN:

Q Good morning, Dr. Beik.

A Good morning to you, sir.

Q We are here for round two of your deposition, although today's deposition we're going to be talking about a different IPR proceeding than what we talked about on Tuesday. The IPR proceeding that we're talking about today is IPR 2024-00139 regarding U.S. Patent Number 10,177,551, which I will refer to today as the '551 patent.

Based on agreement with counsel on Tuesday, I'm not going to bother going into your background and qualifications. We did that on Tuesday, and that will be part of the deposition transcript for this IPR as well.

So we're going to just get right to the substance of the IPR. Dr. Beik, we've put in front of you exhibit -- what's been marked as Exhibit 1002 in the '551 IPR, which is your declaration that you've submitted on behalf of Affordable Wire

Management in this proceeding.

Would you go, please, to Paragraph 32 of your declaration. In Paragraph 32 you define the person of ordinary skill in the art, correct?

A Yes.

Q Okay. And it is your opinion that a person of ordinary skill in the art with respect to the '551 patent would have a bachelor's degree in a pertinent discipline such as electrical engineering, civil engineering, mechanical engineering or equivalent, with two to three years of experience in electrical power systems, planning and design. With the understanding that the number of years can be less depending on the level of education.

The -- you've reviewed the petition itself that was filed in these IPR proceedings, have you not?

A I've looked at it.

Q Okay. The -- your definition of the person of ordinary skill in the art is slightly different than what is set forth in the petition. Instead of referring to electrical power systems, the petition refers to utility power systems -- or, I'm sorry, electrical utility systems, planning and design, whereas your declaration says electrical

power systems, planning and design.

Is there a difference between electrical power systems and electrical utility systems?

A Could I please look at that?

Q Sure. Page 23.

A Could you repeat the page number again?

Q 23.

A Okay. Could you repeat your question, please?

Q Yes. Is there a difference between electrical utility systems and electrical power systems?

A "Electrical power system," it's the general word or term that we use to refer to generation, transmission, distributions. People or companies who own wind farms, solar farms and so on and utilities as well. So it's a part of a power system.

Q The utility is part of power systems. Is that what you're saying?

A Utility -- electrical utility systems are part of power systems.

Q So electrical power systems is a broader category than electrical utility systems; is that correct?

A That is a fair statement, sir.

Q So as between your definition of the person -- of the person of ordinary skill in the art in your declaration and the definition that is stated in the petition, what would you say is the more accurate level of skill with respect to the '551 patent?

A When it comes to experience, I don't see any difference. Anyone within electrical utility systems or electrical power systems, with what I have put forth, would be sufficiently -- would have the -- would be categorized as a POSITA.

Q Would you characterize the subject matter of the '551 patent to be more accurately within electrical utility systems or electrical power systems?

A These are two distinguished words that they don't really have a difference in this context in terms of the POSITA.

Q But in terms of the subject matter of the '551 patent, would you say that the subject matter of the '551 patent relates more accurately to electrical utility systems or electrical power systems?

A I don't distinguish them.

Q Okay. Dr. Beik, would you agree that a

POSITA with respect to the '551 patent would be familiar with the NEC and the IEEE and their requirements for a grounding system?

MR. SWEENEY: Objection. Form.

A Could you please maybe rephrase that? What do you mean by "familiar"?

Q (BY MR. FLYNN) Would you agree, Dr. Beik, that a POSITA with respect to the '550 patent -- '551 patent would be knowledgeable about the NEC and the NEC's requirements for a grounding system?

A I don't know. That's a little bit broad. NEC and IEEE are standards, that they exist. A POSITA who practices electrical power systems or utility would have sufficient knowledge. I don't know about the level of knowledge with respect to those two standards.

Q Would you agree that the grounding system of the '551 patent would need to be in compliance with the NEC requirements for grounding system?

A All grounding systems in the United States would need to be compliant with relevant standards.

Q If you would turn to Paragraph 35, please, of your declaration. You start out Paragraph 35 referring to the term "grounding," correct?

A Excuse me, you said Page 35 or

Paragraph 35?

Q I meant Paragraph 35. If I said page, I'm sorry.

In Paragraph 35 of your declaration you state that grounding, in quotes, generally refers to providing a path for stray current to be safely conducted to the earth. Correct?

A That is correct.

Q And you further state that in systems, grids and certain equipment, a ground wire, cable, structure or other mechanism is required. Correct?

A That is correct.

Q Towards the bottom of the page, second line up from the bottom, the sentence beginning, One of the main goals. Do you see that?

A I see this, sir.

Q And it says, One of the main goals in designing a grounding system is to design a path with a low resistance to ensure that a stray current will always be dissipated through the ground wire and not any other parallel paths.

Do you see that?

A I see this.

Q When you refer to other parallel paths, what are you referring to?

A The stray current, the non-load current will need to go through the designated ground path. If there are other parallel paths connected to that bus bar, it should not go through any of those.

Q The ground wire that you refer to in Paragraph 35 of your declaration is the same as a grounding conductor; is that correct?

A All elements within the ground path or ground current path must be conducted.

Q My question was slightly different than that.

The ground -- a ground wire and grounding conductor are the same thing, are they not?

A A grounding conductor or a ground conductor or a ground wire, it's an element used in the grounding system.

Q Again, my question is slightly different.

I understand that a ground conductor is used in a grounding system, that a ground wire is used in a grounding system.

My question is, is grounding conductor and ground wire, are those terms synonymous?

A You can use them synonymous.

Q Thank you.

Dr. Beik, you've just been handed excerpts

of what have been -- what has been marked as Exhibit 1007 in this IPR proceeding, excerpts from the 2008 NEC.

The 2008 NEC is one of the exhibits that you have submitted in connection with your declaration in this IPR proceeding, correct?

A I have cited to NEC 2008.

Q Dr. Beik, are you familiar with the -- or strike that.

Are you aware of what the priority date is of the '551 patent?

A I don't remember off the top of my head. Could you please hand me the patent.

Q We've just handed you the '551 patent, which has been marked as Exhibit 1003 in this IPR proceeding.

A I thought this is 1001.

Q Oh, sorry, you are correct. I am mistaken. I was looking at the wrong patent. It indeed has been marked as 1001. Thank you for the correction.

Looking now at the '551 patent, can you tell me what the priority date is or what you understand to be the priority date of the '551 patent?

A I can see that this, on Line 22, it states October 5th, 2017, Filed.

Q And you understand that to be the priority date?

A I can't see any other continuation or other things in this. I'm going to assume this is the priority date.

Q Okay. Dr. Beik, are you aware that there was also a 2014 NEC?

A There exists, I believe, a 2014 NEC.

Q Do you know why -- strike that.

Why were you relying upon the 2008 NEC rather than the 2014 NEC with respect to your declaration in this proceeding?

A No particular reason.

Q If you would go -- it should be the second page of your excerpted Exhibit 1007, where it is the -- you have to go, I guess, a little bit further than that. Keep going.

Look at page -- on the bottom right corner it's 70-27. Are you at that page, 70-27?

A 70-1?

Q 27.

A 27.

Q Yeah. We don't include all the pages.

But that's the one I want you to go to. Okay.

You see there on that page, Dr. Beik, there is the definition of a grounding conductor. Do you see that?

A I can see that.

Q And the NEC specifically defines grounding conductor as a conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes. Correct?

A I can see this.

Q Do you agree with that -- that that's the definition provided by the NEC for a grounding conductor?

A That's the definition by NEC.

Q Would that -- would you agree with that definition? Would that be your definition of a grounding conductor as well?

MR. SWEENEY: Objection. Form.

A This is an NEC that I referred to. We in electrical engineering, like any other fields, may use different terminologies to refer to the same thing.

Q (BY MR. FLYNN) Would you define grounding conductor any differently than what the NEC's definition is for that term in the 2008 version?

A A POSITA would know a grounding conductor is a conductor that's used in a grounding system.

Q Would you -- would a POSITA also understand that -- as the NEC provides, that a grounding conductor is used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes?

A A POSITA would know that in a grounding system, you must complete the path with different elements, one of which is grounding electrode or simply we refer to as electrode.

Q And then below the -- two definitions below grounding conductor is the definition for grounding electrode. Do you see that?

A I see this.

Q And the NEC's definition of grounding electrode is a conducting object through which a direct connection to earth is established.

Do you see that?

A I see this, sir.

Q Would you agree, Dr. Beik, that mechanical supports are not grounded merely by virtue of resting on the earth or being embedded in the earth?

MR. SWEENEY: Objection. Form.

Q (BY MR. FLYNN) You can answer.

A I do not agree with that statement.

Q You believe that it is sufficient, for example, for a metal pile, in order for it to be grounded, it would be sufficient for the metal pile to be imbedded in the earth?

A This is a hypothetical situation. As long as -- and the POSITA and a designer would know. As long as you provide the necessary path with the resistance necessary, that's what suffice.

If that happens with a pipe some distance buried under the ground, as long as it satisfies the requirements, that could act as one.

Q Would a metal pile, without anything else, that's imbedded in the earth, would that be considered to be grounded?

A I have no way of verifying that, sir.

Q What would you need to know?

A I would need to know the resistance of the earth, the humidity, the resistance of the pipe the dimension of the pipe, all the details that allows me to calculate what would be the specification while in the ground.

Q So simply looking at a metal pile that's imbedded in the earth, without knowing all of this other information that you just articulated, you

wouldn't know whether it was sufficient to ground that metal pile just by virtue of it being imbedded in the earth; is that correct?

A That is a fair statement.

Q Dr. Beik, is it necessary, in order to comply with the NEC, for mechanical supports to be grounded through a grounding conductor to a grounding electrode?

A I'm not sure if I understand. Could you please rephrase it?

Q Does the NEC require mechanical supports to be connected through a grounding conductor connected to a grounding electrode?

A I cannot recall if NEC states that expressly or not, but in any design, you must take into account mechanical support.

Q When you say "take into account mechanical support," what do you mean?

A You have to provide a secure, long-lasting, within the lifetime of that ground system, a design that takes into account all the mechanical elements of that grounding system.

Q And taking into account the mechanical elements of that system, would you agree that metallic mechanical elements would need to be

connected through a grounding conductor to a grounding electrode?

A You need a conducting path from the element or equipment to the ground. Every single element off that grounding system must have -- must be conductive, must have mechanical strength as required to support that system.

Q And would metallic mechanical elements be required to be connected to a grounding electrode through a grounding conductor?

A It has to be conductive. Metal is one conductor. You don't have to use it. As long as you satisfy a low-resistance path with all the conductive elements and mechanical considerations, that would be sufficient.

Q So is your answer that it would be not necessary to connect metallic mechanical elements that are by themselves conductive by virtue of being metallic to a grounding electrode through a grounding conductor?

A I do not believe that was my statement, sir.

Q Then let me ask you again.

Is it your statement that a metallic mechanical element is required to be connected to a

grounding electrode through a grounding conductor?

A That is not my statement, sir. My statement was clear. Metal is one type of conductor. As long as you provide a low-resistance -- I'll repeat this. As long as you provide a low-resistance path that is -- it includes mechanical consideration from that element to the ground, that is sufficient.

Q And when you say "to the ground," do you mean to the earth, to the soil?

A From start point to the endpoint, and that endpoint depends on where the ground is.

Q I don't understand that, sir.

My question was, when you say "as long as there's a sufficiently low-resistance path to go to the ground" --

A Uh-huh.

Q -- when you say "to the ground," does that mean to the earth?

A That's the definition of NEC as you directed me at Page 70-25 [sic], top of the page, left, Ground, dot, The earth.

Q In order to be grounded to the earth or to the soil, is it necessary for the mechanical element to be connected to a grounding electrode?

A One element that is used in the grounding

system is an electrode. You need to create the connection from the element to the electrode to the ground.

Q Thank you, sir.

In Paragraph 37 of your declaration, if you would look at that, please, you refer to both the 2008 NEC and the IEEE, correct?

A Yes, sir.

Q In Paragraph 38 of your declaration, you specifically cite to an excerpt from the 2008 NEC, which is Exhibit 1007, correct?

A That is correct.

Q Both the -- I'm sorry, you specifically include in your declaration an excerpt from Article 250.4(A)(4), correct? It's underneath the -- underneath the chart there -- or that chart.

A Yes, sir.

Q Okay. Article 250.4(A)(4) refers to an effective ground fault current path. Do you see that, the very last line of that on the bottom of your excerpted table?

A Yes, sir.

Q Okay. Article 250.A4 of the NEC states, Normally non-current-carrying electrically conductive materials that are likely to become energized shall

be connected together and to the electrical supply source in a manner that establishes an effective ground fault current path.

Do you see that?

A Yes, sir.

Q What is your understanding of what an "effective ground fault current path" is?

A One thing that I'd like to note is what I have cited is 250.4(A)(2) to (4).

Q Yes.

A You only referred to it to a (4). It's (2) to (4).

Q Correct.

A A POSITA would know an effective path is the one that provides a low resistance. It has the mechanical considerations from the point of that element to the end.

Q Would you look, please, at Exhibit 1007 -- the excerpted Exhibit 1007. And if you would go, please, to Page 70-95, and on that page is Article -- let me know when you've got there.

On that page is Article 250.4(A)(5). Do you see that, entitled Effective Ground Fault Current Path?

A Yes, sir.

Q And that provision of the NEC provides that electrical equipment and wiring and other electrically conductive material likely to become energized shall be installed in a manner that creates a low-impedance circuit, facilitating the operation of the overcurrent device or ground detector.

Do you see that?

A Yes, sir.

Q When you referred a moment ago in your answer to a "low-impedance path," that is the same kind of thing that what the NEC is referring to in this provision; is that correct?

A To be precisely correct, I referred to it as a low-resistance.

Q Low resistance.

A But it's the same as low impedance. This is a more generic word used because an impedance includes a resistance and an inductance.

Q So do you agree with that provision of the NEC as to how it defines an effective ground fault current path?

A A low-resistance path -- low impedance.

Q You agree with that definition?

A I agree with that definition.

Q Thank you.

In order to provide an effective ground fault current path, Dr. Beik, is it enough for simply that metal components be connected together?

Let me restate that question.

Are metal components that are simply connected together enough by themselves to provide an effective ground fault current path?

A That's a very broad statement. I would not know that.

Q Is that because, as you were describing a few minutes ago, you would need to know more information about the metallic components and how they're connected together?

A To provide an effective ground path one must take into account -- the POSITA would take into account from the element to the endpoint all the conductive path, the resistance, the connection, mechanical strength and so on.

Q And so you would need to know that kind of information to know whether metallic parts connected together would be enough to provide an effective ground fault current path; is that correct?

A That's one of the things that I would need to know.

Q Dr. Beik, we've handed you excerpted

portions of what has been marked in these proceedings as Exhibit 1028, which is from the 2007 IEEE Green Book, correct?

A Yes, sir.

Q Okay. Would you go, please, to -- again, these are just excerpts. This is obviously not the entire exhibit. If you would go to Page -- and now the page number I'm going to refer to is, again, in the bottom right corner of the page, and I'm looking for Page 85 of 225.

Do you see that?

A (Nodded head.)

Q And this is -- on that page, it begins Chapter 2, which is entitled Grounding -- Equipment Grounding, correct?

A That is correct, sir.

Q And under 2.1.2, General, the first sentence states, The term "equipment grounding" includes the equipment grounding conductor, in parentheses, EGC, and refers to the interconnection, in parentheses, bonding, and grounding of the non-electrical metallic elements of the system.

Do you see that?

A (Nodded head.)

Q A little bit further down it says,

Examples of components of the equipment grounding system are -- and then it lists various things. And one of it is, Grounding conductor, in parentheses, wire.

Do you see that?

A Yes, sir.

Q Is what's stated in paragraph -- or Section 2.1.2, that first paragraph, in accord with your understanding of equipment grounding and equipment grounding conductor?

A This is describing what an equipment grounding or, simply, grounding includes.

Q If you look at 2.1.2(D), Subsection D. Do you see that?

A (Nodded head.)

Q It says, The earth shall not be used as the sole EGC or fault current path.

Do you see that?

A Yes, sir.

Q Do you agree with that?

A Yes, sir.

Q It goes on to state, The basic objectives of an equipment grounding system are the following. 1 is to reduce electric shock hazard to personnel.

You would agree with that, correct?

A Correct.

Q 2 is to provide adequate current carrying capability, both in magnitude and duration, to accept the ground-fault current permitted by the overcurrent protection system without creating a fire or explosive hazard to building or contents.

You would agree with that as well, correct?

A That is correct, sir.

Q And 3 is to provide a low impedance return path for ground fault current necessary for the timely operation of the overcurrent protection system.

Do you see that?

A Yes, sir.

Q And you would agree with that as well?

A I agree with this.

Q And, sir, if you would turn, please, to Page 87 of 225. At the top of the page is Section 2.1.5, Overcurrent Protection Operation. And it states, The equipment ground system is an essential part of the overcurrent protection system.

Do you see that?

A Yes, sir.

Q And you would agree with that?

A I agree with that.

Q And the next sentence, The overcurrent protection system requires a low impedance ground return path in order to operate promptly and properly, in parentheses, see NEC.

Do you see that?

A I see this.

Q And you agree with that as well?

A I agree with this.

Q Dr. Beik, would you turn, please, to Paragraph 47 of your declaration. In Paragraph 47 of your declaration you refer to -- hold on one second. You refer to the Williams reference, do you not?

A Yes, sir.

Q And the Williams reference is -- and we just handed you the Williams reference, which has been previously marked as Exhibit 1020.

A Yes, sir.

Q Do you recognize that, that exhibit?

A Yes, sir.

Q In Paragraph 47 of your declaration you say, Notably, Williams provided for the use of metal components and the use of a messenger cable that is always grounded.

Do you see that?

A Yes, sir.

Q And that is -- you cite for that statement to Column 1, Line 7 to 13 of Williams, right? Correct?

A Correct.

Q Okay. Dr. Beik, are you suggesting in Paragraph 47 that the messenger cable that is always grounded in Williams is a grounding conductor?

A This messenger wire provides a ground path to the ground.

Q My question was, are you saying that the grounded messenger cable in Williams is acting as a grounding conductor?

A If this conductor is grounded and it provides low path for the current to the ground and meets the specification of NEC, it will be a part of grounding system, thus it will be a grounding conductor.

Q But without knowing that information that you've talked about before, you can't determine whether the grounded messenger cable disclosed in Williams is acting as a grounding conductor, correct?

A I cannot recall the details. But a POSITA would look at this and would say that would be a ground -- a part of a ground system in the absence of

any other grounds in this photos or in this structure.

Q Well, again, whether it would be part of a ground system, I want to be clear, what I'm asking you is whether you understand or you are suggesting that the grounded messenger cable disclosed by Williams is a grounding conductor.

A As I describe in my previous answers, a grounding conduct -- a ground conductor is a conductor in a grounding system. This is grounded. It explains it's grounded. I do not see any other grounds in this picture, thus a POSITA's conclusion would be this is a part of grounding system, thus a grounding conductor.

That word that Mr. -- and you're referring to, it's simply -- it's a conductor in a grounding system.

Q What word are you referring to that I'm referring to?

A You said "grounding" or "grounded conductor," as per NEC?

Q The term that I used is "grounding conductor." And specifically as used in the NEC.

A It's a conductor in a grounding system. It would not be a grounding conductor if it's not in

a ground system, sir.

Q I'd like to ask you again --

A Sure.

Q -- based on the disclosure of Williams whether it is your opinion or your position that what is referred to in Williams as a messenger cable that is always grounded is the grounding conductor as that term is used in the NEC.

A In the absence of any other ground system within this, that's what a POSITA would conclude, that a messenger wire grounded acts as a part of grounding system, thus a conductor in a grounding system or, as you wish, grounding conductor.

Q And so that opinion is based on -- strike that.

Your opinion of what a POSITA would understand, that that would be a grounding conductor, is based on the absence of any disclosure in Williams, including in Figures 1 and 2 that you include in your declaration, of any other kind of grounding conductor; is that correct?

A There is no other grounding conductor. The messenger is grounded. A POSITA would assume that this satisfies as the low resistance path to be a part of grounding system, sir.

Q Thank you, sir.

You would agree, would you not, that Williams -- the Williams patent is not directed in any kind of way to a grounding system, right?

A Patent '924, Williams, discloses an attachment as a pole top extension and discusses being connected to a messenger wire that is grounded.

Q My question is, you would agree that Williams is not directed to a grounding system, wouldn't you?

A It does not expressly discuss the grounding system.

Q In fact, if you'd look, please, beginning at Line 7, Williams discloses that, It had previously been possible for a lineman to stand on the messenger cable. And as this is always grounded, serious results and frequently fatalities have followed when the lineman has been working on a live cable carried by the pole above the messenger cable.

You see that, correct?

A Yes, sir.

Q And the purpose of Williams is to come up with a fixture or a way of making it impossible for a lineman to stand on a messenger cable to avoid that risk of injury, correct?

A Could you show me where it states that?

Q If you'd look at Line 36, please. And I'll read it. It is the object of the present invention to so equip the metal fixture which carries the messenger cable that it is an utter impossibility for the lineman to stand thereon.

Do you see that?

A I see this, sir.

Q And that's the purpose of Williams, correct? That's what Williams is directed to?

A I agree with what's stated here.

Q If you would turn to Paragraph 50 of your declaration, please. You refer in Paragraph 50 to the well-known benefit of using the messenger cables as a grounding conductor.

Do you see that?

A Yes, sir.

Q You are familiar with and knowledgeable of, as a result of your participation in these IPR proceedings, of the CAB grounding system, are you not?

A I'm not sure what you're referring to, sir.

Q Again, as per the other day, CAB is the acronym for the patent owner, Cambria Association for

the Blind and Handicapped.

A I understand that part.

Q Have you seen a CAB system that utilizes the messenger wire as both a support structure and a grounding conductor?

A I have looked at CAB website and their concept paper, white paper, and they disclose elements. Messenger wire that acts as a ground -- as a part of a grounding system.

Q Is the answer yes, you've seen the CAB system on the website?

A Can you show me like an excerpt or something? I'm not --

Q I'm asking you if you have seen it. That's all I'm asking you.

A I have not seen all of CAB's systems. That's my answer, sir.

Q Prior to the CAB system or whatever you remember seeing at the CAB system on the CAB website --

A Uh-huh.

Q -- are you aware of anyone who has used a messenger cable --

A Uh-huh.

Q -- in a grounding system as both a support

structure --

A Uh-huh.

Q -- and as a grounding conductor that provides an effective ground fault current path?

A I believe I cited a few in my declaration.

Q Is what you've cited in your declaration the extent of what you believe were prior art systems that used a messenger wire as both a support structure and as a grounding conductor to provide an effective ground fault current path?

A Those are examples of prior art. If there are others -- there could be others, or many others, but --

Q I'm sorry.

A -- I only provided a few.

Q Are you aware of any others other than what you've provided?

A I don't remember.

Q As you sit here today, you can't tell me of anything -- any other system -- strike that.

As you sit here today, you can't tell me of any other prior art system, other than what you've provided in your declaration, that used a messenger cable both as a support structure and a grounding conductor to provide an effective ground fault

current path; is that correct?

A I don't memorize things, sir. I don't remember.

Q Is it fair to say that if you would have been aware of any other reference that used a messenger cable as both a support structure and a grounding conductor that provided an effective ground fault current path, that you would have included that reference in your declaration?

A I believe what I have provided in the declaration is sufficient.

Q That wasn't my question.

My question was, is it fair that if you had been aware of any other prior art reference than what you have provided in your declaration that used a messenger cable as both a support structure and a grounding conductor that provided an effective ground fault current path, that you would have included that reference in your declaration?

A I'm not sure if it's fair. What if this becomes a thousand pages? I have included, sir, what I believe is sufficient.

Q Paragraph -- excuse me -- 50 of your declaration, you refer to the South -- 2003 Southwire triplex service drop cable as an example of the use

of a messenger cable as both -- both as a support structure and as a grounding conductor that provides an effective ground fault current path, correct?

A Can I read this, please?

Q Yes.

The Southwire exhibit, please.

Oh, I'm sorry, it's in your -- we don't have that exhibit because it's in your declaration. If you turn to Paragraph 50 of your declaration.

A May I read this, please?

Q Absolutely.

A Could you please repeat your question?

Q Yes. You have identified the 2003 Southwire triplex service drop cable as one of the examples that identifies the use of a messenger wire both as a support structure and as a grounding conductor that provides an effective ground fault current path, correct?

A Expressly. This is a neutral messenger where the neutral in the United States is grounded and used as a grounding -- a part of a grounding system.

Q Whether it's used as part of a grounding system, are you suggesting in Paragraph 50 of your declaration and in your testimony today that the

messenger -- the neutral messenger cable disclosed by Southwire is a grounding conductor that provides an effective ground fault current path?

A This is the commercial product. It has gone through standards, certification. A POSITA would assume that this has all the elements to be a neutral messenger and in the United States, neutral is used, and grounded, as part of a grounding system, thus it is a conductor in the grounding system, hence a grounding conductor.

Q Do you understand in the United States the use of the term "neutral wire" or "messenger wire" or "neutral messenger cable" in the United States is a cable that is intended to carry current under normal operating conditions?

MR. SWEENEY: Objection. Form.

Q (BY MR. FLYNN) You can answer.

A Can you repeat your question, please?

Q Sure. As used in the United States, do you understand that a neutral messenger wire -- or neutral messenger is a wire that is intended to carry current under normal operating conditions?

A I do not agree with that statement.

Q The reference to the "triplex service drop," that service drop is something that is

typically used and it can extend from the pole to a building, correct?

A Not necessarily.

Q In this triplex service drop, is it correct that the neutral messenger is connected with the phase conductors?

A I do not believe so, sir.

Q So when you see the picture of the Southwire triplex service drop cable that you included in Paragraph 50 of your declaration, do you understand that any of those cables are phase conductors?

A I believe some of them that looks like have insulation they are phase conductors.

Q And do you believe also, therefore, that the neutral messenger in this triplex service drop cable is latched with these phase conductors?

A They are bundled together as a part of one cable system.

Q And so the neutral messenger that is bundled with the phase conductors in the Southwire triplex service drop cable, in your view, would be a grounding conductor as used in the NEC; is that correct?

A As I described, this is a commercial

product. I assume, as a POSITA, it has been certified, thus passed all the standards and is eligible and it is a part of a grounding system, thus a grounding conductor. It's not the only part. It's one of the parts of the grounding system.

Q You specifically state in Paragraph 50 of your declaration, In my experience in this industry, in quote, neutral messenger, close quote, refers to a messenger cable that doubles as a grounding conductor.

Correct?

A That is correct, sir.

Q And you're referring to a grounding conductor as used in the NEC?

A That is correct. It's a part of a grounding system, a conductor in a grounding system.

MR. SWEENEY: We've been going for about an hour.

MR. FLYNN: Whenever you want to take a break.

MR. SWEENEY: Is this a good spot?

MR. FLYNN: Sure.

(Recess from 10:37 a.m. to 10:47 a.m.)

Q (BY MR. FLYNN) Dr. Beik, I wanted to ask you one more question about the Southwire triplex

service drop cable. Do you know, or is it your understanding, that the neutral messenger that is bundled with the phase conductors is part of the electrical circuit that includes those phase conductors?

A What do you mean, sir, by "electrical circuit"?

Q By virtue -- well, the phase conductors are carrying current as part of the circuit, correct?

A Usually, yes.

Q And by virtue of the neutral messenger being bundled together with those phase conductors, does that make the neutral messenger part of the circuit together with the phase conductors?

A It doesn't necessarily have to be. It could be.

Q As disclosed in Southwire, is it?

A I can't say. I have to look at the wire that goes from Point A to Point B to the service point. I have to examine it.

Q All right. I think we've already given you the '551 patent, which is Exhibit 1001, correct?

A Yes, sir.

Q Dr. Beik, is it fair to say that you have analyzed the '551 patent?

A Yes, sir, I have analyzed '551.

Q In your declaration, if you would go to Paragraph 30, please. Paragraph 30 is the first paragraph in the section of your declaration entitled, The '551 patent, correct?

A That is correct.

Q And Paragraph 30 and Paragraph 31 are the only two paragraphs that you include in your declaration to describe the '551 patent, correct?

A I don't know, but I can tell you these two do discuss this.

Q There's no portion of your description of the '551 patent that includes any analysis of the specification, is there?

A I cannot remember, sir.

Q There's nothing in Paragraph 30 or 31 about the specification of the '551 patent, correct?

A In Paragraph 31, I refer to it as a grounding -- I quote from the patent, a grounding system structure to ground a number of cables supported by a support assembly, from the abstract.

Q And that's from the abstract, correct?

A (Nodded head.)

Q And beyond that quote from the abstract, you don't discuss anything further about the

specification or provide any analysis of the disclosure of the specification of the '551 patent, correct?

A I don't know. I'd have to go through my declaration. I have not memorized it. This was done a year ago, almost.

Q You don't include, as part of your declaration, any claim construction section, correct?

A Can you explain to me what you are referring to?

Q You don't include -- before I ask that question, I was late in hearing what you said about that it's been almost a year since you prepared the declaration, and I wanted to ask you this question.

You've reviewed this declaration in preparation for your deposition today, haven't you?

A I have looked at it, sir.

Q Have you analyzed your declaration in preparation for today's deposition?

A I have analyzed it.

Q Have you gone through the entirety of the declaration?

A I have not gone through every single page, but it's my declaration. I have looked through it.

Q Okay. Your declaration doesn't include

any section about how particular claim terms should be construed, does it?

A I think there is one element that I declared that I understand the claim constructions. Is that what you're referring to?

Q I don't know. What element are you referring to?

A You stated that if I include any claims in my declaration.

Q Any claim construction section. So when I use the term "claim construction," I'm talking about any analysis about how any particular claim term should be construed.

Do you know whether you have anything in your declaration that analyzes the proper construction of a claim term?

A I believe at the end I have discussed some of the claims. Like, I can go to this section, if you like.

So it appears that section Invalidity Grounds starts Page 44. X, dot, Invalidity Grounds of my declaration after the prior art and goes through Ground 1, claims such and such and continues. I can tell you where it ends.

Q So you're referring to that portion of

your declaration where you are discussing your opinions in the Invalidity Grounds section, your opinions as to how the prior art references cited in the various grounds disclose the claim limitations of the '551 patent, correct?

A I analyzed the claims in this section, and then I refer to the prior art in my discussion.

Q Dr. Beik, would you agree that the grounding system -- well, strike that.

Let me ask you this first. Do you agree that the '551 patent is directed to a grounding system?

A I understand the paper discusses a grounding system structured to ground a number of cables supported by a support assembly includes a multifunction line assembly and a number of conductive mounting assemblies. Each conductive mounting assembly is structured to be coupled to the multifunction line and to a conductive path.

Q So is the answer yes, you would agree that the '551 patent is directed to a grounding system?

A As it says in the title, yes, sir.

Q Would you agree that the grounding system of the '551 patent, like any grounding system, would need to be NEC code compliant?

A Any grounding system in the United States in application would need to be NEC compliant. I do not know in the patent that it must be as well.

Q Okay. Would you look at the '551 patent, please, and just look at Column 2. At Line 5 of Column 2 it refers to regulations. Do you see that?

A That is correct, sir.

Q Do you understand that that portion of Column 2 that is discussing the grounding conductor and other aspects of the grounding conductor that it is disclosing what regulations, that would include, for example, the NEC, would require for that grounding conductor?

A I understand that this discusses many regulations. It does not cite any.

Q You would include NEC, IEEE, those kinds of standards and codes as part of the regulations that would govern grounding systems, correct?

A I would. It does not say here.

Q Is it your opinion that a POSITA reading the specification, and particularly this section of it, would understand that the regulations are applying to codes and standards like the NEC and the IEEE?

A A POSITA would conclude NEC and IEEE are

some of the regulations.

Q Thank you.

Dr. Beik, if you would go to Column 1, please, beginning at Line 24. That portion of the specification defines messenger wire, correct?

A It talks about it.

Q Beginning at Line 24 the specification states, The, quote, messenger wire, closed quote, is and as used herein a robust cable structured to support a number of other wires, in parentheses, hereinafter, quote, supported wires, close quote, close parentheses, and which is not structured to carry a signal or power.

Do you see that?

A An ungrounded messenger wire that's purely used for support --

Q I'm just asking if you saw that portion of the specification.

A I saw that portion.

Q When it says that -- when it defines the messenger wire to be not structured to carry a signal or power, what do you understand that to mean?

A This is referring to an ungrounded messenger wire purely used for a support system.

Q And when it's used solely as a support

system, it does not or is not intended to carry current under normal operating conditions, correct?

A No grounding system is intended to carry current under normal conditions.

Q Well, current wires are, right?

A That's not grounding system, sir.

Q My question to you is simply that a messenger wire that is used solely as a support structure is a wire that is not intended to carry current under normal conditions, correct?

A That is a fair statement.

Q Okay. Beginning at Line 30 -- I believe it's 36, the paragraph, For example. Do you see that?

A Which column, sir?

Q Column 1. I'm sorry.

A Yep.

Q So it's now -- that paragraph is discussing solar plants that comprise large arrays of solar panels spread out over a large area, right?

A (Nodded head.)

Q And around Line 50 the specification refers to a conductor that carries current, direct or alternating, from a solar panel and as used herein that would be a, quote, current wire, correct?

A I can see this, sir.

Q Okay. And then at 55 the specification states that the bundle of current wires is supported by a series of cable hangers suspended from a messenger wire.

Do you see that?

A I see this, sir.

Q And that is how, in the context of the '551 specification, the messenger wire is acting as a support structure. It is supporting the hangers that are suspended from it. Is that your understanding?

A That's one function of a messenger wire.

Q I'm talking specifically the messenger wire as described in the '551 specification.

MR. SWEENEY: Objection. Form.

A There are multiple instances here that messenger wire is used as a ground wire. So are you saying that purely this patent is discussing non-grounded messenger wires?

Q (BY MR. FLYNN) When it uses the term "messenger wire" --

A Uh-huh.

Q -- only "messenger wire," what the patent is referring to is a messenger wire that is used solely as a support structure for the cable hangers

and the current wires that are supported by the cable hangers?

A That's not what all the patent discusses.

Q Do you believe that the patent discusses or describes, discloses other purposes of, again, just the term "messenger wire" as is used and defined in the specification?

A Yes, sir.

Q Could you point that out to me, please.

A Paragraph 60, Column 1, While the messenger wire is not structured to carry a current, there are instances wherein the messenger wire does carry a current.

If it carries a current, it cannot be only a support structure.

Q "Messenger wire" as used in the '551 specification is intended to only be a support structure, correct?

A I'm looking at that -- the -- the statement, I just read it to you, it doesn't say what you're saying.

Q You're interpreting that statement to mean that the messenger wire as defined in the specification is intended to carry current?

A I don't believe I said that. Just read

Line 60, sir. I am referring to this. You're saying it only is that I'm saying the inventor himself or themselves or herself is defining it such. And I agree with that statement.

Q One of the examples that the specification includes as to when a messenger wire does -- strike that.

Column 60 says -- or, I'm sorry, Line 60 in Column 1 says, While a messenger wire is not structured to carry a current -- do you see that?

A Yes, sir.

Q Do you understand what "structured to" means in the context of the '551 specification?

A I understand this whole sentence, sir.

Q Are you aware of whether the term "structured to" is defined in the '551 specification?

A I understand the sentence and the words that is used in the sentence. If you're referring to "structured" and it's defined somewhere, please point me at that.

Q Would you look at Column 3, please.

A Okay.

Q And beginning at line -- Column 3, Line 43 --

A Uh-huh.

Q -- it says, As such and as used herein, quote, structured to, in brackets, verb, close quote, recites structure and not function. Further, as used herein structured to, verb, means that the identified element or assembly is intended to and is designed to perform the identified verb.

Do you see that?

A I can read this, yes.

Q Now if you'll turn back to Column 1, Line 60. Where it says, While the messenger wire is not structured to carry a current, you understand now that that means that the messenger wire is not intended to or designed to carry a current, correct?

A If it's only used for the support and you -- I cannot leave that hanging without completing the sentence, sir. There are instances wherein the messenger wire does carry a current.

Q Yes. But those instances where it does carry a current is -- does not mean that the messenger wire is structured to carry a current, correct, or intended to carry a current?

A If a messenger wire does not carry a current and its only purpose is to support some assemblies, that's a messenger wire purely used for support.

Q One of the ways -- one of the examples that the specification describes when the messenger wire does carry a current is in the event of a lightning strike. If lightning strikes the messenger wire or the current wires, et cetera. Correct?

A It's one example of the time that the messenger wire may carry a current.

Q And it also -- the specification also says at Line 65 that, Further, a current wire or any other wire carrying a current can fail, creating a short or other undesirable current in the supported bundle of wires.

Do you see that?

A That is correct, yes.

Q That is another example described by the specification, separate and apart from a lightning strike.

A That is talking about current wire, as you defined and read to me what the current wire is. So inventor is saying a current wire -- Further, a current wire or any other wire carrying a current, a current wire, can fail, creating a short or other undesirable current in the supported bundle of wires.

It is referring to current wires, not that messenger wire.

Q Whether it's a lightning strike striking the messenger wire or a fault in the current wires, those scenarios are referring to fault conditions, correct?

A I'm not sure if lightning is referred always to as a fault. We have fault where the inventor explains in the second paragraph, further, that means it fails, it faults. And above that the inventor is talking about lightning strikes. So he, she or they are distinguishing them, at least from this what I understand.

Q So a lightning strike on the messenger wire will energize the messenger wire with a current surge; is that right?

A It could.

Q Okay. Now, the specification, after describing that a current wire or any other wire carrying a fault can fail, creating a short or other undesirable current in the supported bundle of wires, it then goes on at the bottom of Column 1 and over onto Column 2 to say, This is why a conductor or grounding wire is disposed adjacent the messenger wires. Hereinafter, such a wire is identified as a grounding conductor.

Do you see that?

A Yes, sir. I read this.
Q Do you know what that's referring to?
A As a POSITA I have an understanding of this, sir.
Q What is your understanding?
A Every system in the United States needs to be -- needs to have a ground.
Q Just a ground? Or --
A A grounding system.
Q Does that include a grounding conductor?
A Absolutely. But this does not tell me that -- whether messenger wire is acting as one or not. It's saying if the messenger wire is not the ground, you need a ground. That's it. Common sense. That's the standard. You have to have ground in every system.
Q So, in fact, what the specification says is that the grounding conductor is disposed adjacent the messenger wires, correct?
A In this case he/she/they are referring to a messenger wire being only support. A ground system must be there, and they are placing it adjacent to the messenger wire. You don't have to.
Q So in this system, the grounding conductor is separate from the messenger wire?

A Solely because the messenger wire is not a grounding system here or is not acting as one. In the prior art that I cited, I provided a number of examples that the messenger wire is the ground -- as part of the grounding system, to be accurate, hence a grounding conductor.

Q I was going to ask you because I recall that in several of your prior answers, that you ended it thus way. So when you say that the messenger wire, in those examples that you've cited, is part of the grounding system and thus is acting as a grounding conductor, that's what you're stating, correct?

A Correct.

Q Okay.

A And as I described, every single element in the system of grounding or grounding system must be conductive.

Q Understood.

A So any conductor that uses any grounding system is a ground conductor. It is a conductor. Otherwise, you would not call it that.

Q Do I understand what you just said, that any element of a grounding system is itself a grounding conductor?

A Where did I say that? Please check.

Every element used in a grounding system is conductive.

Q So what -- assuming that this is accurate, your answer was --

MR. FLYNN: How do I make this stop so I can just read it without you moving it?

Q (BY MR. FLYNN) Every single element in the system of grounding or grounding system must be conductive.

And then you said, So any conductor that uses any grounding system is a ground conductor. It is a conductor. Otherwise, you would not call it that.

Is that correct?

A Correct.

Q Okay. The specification in Column 2 at Lines -- beginning at Line 4, again referring to regulation, says, Further, many regulations require that the grounding conductor be grounded at each pile.

Do you see that?

A I see this, sir.

Q And what would be the purpose of grounding the grounding conductor at each pile?

A You have to provide a path to the ground.

Q The specification goes on to say, Presently, the grounding conductor is grounded by splicing a conductor, such as but not limited to, a copper wire, into the grounding conductor and coupling the copper wire to a grounding cable or if the piles are conductive to each pile.

Do you see that?

A I see this.

Q And, again, this discussion or description in the specification is in the context of a solar plant. You understand that; is that right? This is continuing the discussion that begins at Column 1, Line 36.

A I can't say that this is referring only to solar. If you can find me that word exactly. It starts at Line 36. It says, For example, solar plants comprises. . .

But this grounding system, I can't see it's expressly referring to a solar plant.

Q If you look at Column 1, the last paragraph beginning at Line 60 --

A Uh-huh.

Q -- and specifically at Line 63, it's still referring to the solar electric equipment --

electrical equipment.

Do you see that?

A Again, sir, it's exemplifying. It starts with, For example.

Q No, I understand. Dr. Beik, all I'm saying is that when they're discussing the grounding conductor and the grounding conductor being grounded at each pile and the grounding conductor is grounded by splicing a conductor, that that's all in reference to or in the context to of that example of solar. That's all I'm asking you.

A I can't say that, sir.

Q Okay. For purposes of my questions, I'm going to ask you to assume that this discussion is in the context of the solar example discussed in the specification. Okay?

A We can take solar as an example as the inventor exemplified it. These practices are common within power systems across the board.

Q Okay.

MR. FLYNN: This is a new exhibit, 2005.

(Exhibit Number 2005 was marked.)

Q (BY MR. FLYNN) Dr. Beik, we've handed you what we have marked as Exhibit 2005 in the '551 IPR, and I will represent to you that this -- these --

2005 includes a series of photos that are taken from the CAB Installation Guide that is available on its website. Okay?

A (Nodded head.)

Q If you look at the top half of -- or the top two pictures and you see the label for those two pictures where it says, Standard System.

Do you see that?

A (Nodded head.)

Q And on the left-sided picture, do you see that there is a metal pile that's imbedded into the earth? Do you see that?

A (Nodded head.)

Q You have to say "yes" for the court reporter.

A Yes.

Q And you see that there is a bracket that extends from the metal pile. You see that?

A Yes, sir.

Q And that there is a clamp at the end of that bracket, a metal clamp at the end of that bracket, correct?

A Yes, sir.

Q And what appears to be a steel cable that is being clamped to the bracket, correct?

A Yes, sir.

Q And that would be the messenger wire, correct?

A A POSITA would assume that's a messenger wire.

Q And the hanger -- there's an orange hanger there that is suspended from the messenger wire, as the POSITA would understand it, correct?

A That is correct, sir.

Q And then within the hanger carrier surface, there are several current wires, as would be understood by a POSITA, correct?

A A POSITA would assume that current wires are -- might be or will be part of those insulated wires.

Q Okay. And then do you see a copper conductor that is not within the cable-carrying surface but is running along those current wires and adjacent the messenger wire? Do you see that?

A I don't know if this is copper or any other material. I see that there is a cable, a bare cable wire, running above or along that line.

Q And you also see that there is a spliced bare cable from that other bare cable that is spliced from that bare cable over to the metal pile.

Do you see that?

A Yes, sir.

Q From looking at that picture and comparing it to the specification of the '551 patent that describes a grounding conductor that is disposed adjacent the messenger wire and the grounding conductor grounded by splicing a conductor to a conductive pile, would you understand that that picture in Exhibit 2005 is referring to the separate grounding conductor and grounding splice as described in the specification? Would a POSITA understand that?

A I don't know -- I have not seen the handbook. I don't know where this page is coming from.

Q I've represented to you that it's from CAB's Installation Guide.

A I understand that, sir. One is labeled Standard System; the other one is Integrated Grounding System. I don't know what is standard, how it's defined in this form. As I've explained in that, I agree that this is one method of doing this.

Q If that bare wire, as you referred to it as, that is running parallel to the current wires that are within the hanger and adjacent the messenger

cable, if that wire were, in fact, a copper conductor and if that splice from that copper conductor to the pile were also a conductor, such as a copper wire, would you agree, and would a POSITA understand, that that is the type of separate grounding conductor and grounding splice that is described in the specification of the '551 patent?

A A POSITA would understand that this is one way of a grounding system. A POSITA would not agree that's a standard system, as shown in a number of evidences or exhibit --

Q I see what's of concern to you. It's the use of the term "standard system."

A It's one way of doing it.

Q And I will also represent to you that the term "standard system," as used to caption those pictures, is just the term that CAB uses to refer to its system that uses a separate grounding conductor. It wasn't meant to say that that's the way it's standardly done throughout the industry. Okay?

A Thank you.

Q Now, if you look back at the specification, beginning at Line 10 in Column 2, it goes on to say, that is, the copper wire must be spliced into the grounding conductor; i.e., a

grounding splice, and then electrically coupled to the pile or a ground cable. The process of installing the conductors; i.e., splicing the copper wire into the grounding conductor and making an electrical coupling with the pile is difficult, time consuming and expensive. These are problems of the known art.

Do you see that?

A I can see this.

Q And the specification then goes on to say, There is, therefore, a need for a grounding system that is less expensive and which can be installed quickly and easily.

Do you see that?

A I see this, sir.

Q Do you agree that the -- what CAB refers to as its standard system for grounding, that uses a separate conductor and a grounding splice at each pile, that that would be time-consuming and expensive?

A I have no way of verifying that, sir. A POSITA would question this, that how that term is defined and why are you doing that, where we have messenger cable used as grounding wire, as shown in picture below of the same exhibit you showed me, why

didn't you do that. The prior art shows clearly in 2003, those existed before that existed. So --

Q When you refer to "2003," you're referring to that Southwire triplex --

A It's one of those prior arts.

Q So you're referring to the prior art references that you provided in your declaration; is that correct?

A Correct. A POSITA would question that why this is done, not questioning as that's something wrong with it. It's questioning that -- looking at these two pictures, questioning that in 2003, and perhaps before that, there existed a commonly used messenger wire as grounding system.

If the inventor is claiming it's expensive and time-consuming, yet you have answers from prior art, why was this not used? This is a thing that a POSITA would have asked.

Q So if I understand your testimony, you're indicating that the 2003 Southwire, for example, and other examples that you provided in your declaration, are already disclosing a messenger cable that is being used as a grounding conductor, so a POSITA would look at CAB's standard system that uses a separate grounding conductor and grounding splices

and say, Why do you need to do that? You already have solutions that use the messenger wire as the grounding conductor. Is that correct?

A Not --

MR. SWEENEY: Objection. Form.

A The inventor is describing being expensive and time-consuming for that splicing. A POSITA for that reason would look at, Well, that's one way of doing it. We have other ways of doing it. Have you looked at them?

Q (BY MR. FLYNN) And those other ways of doing it that you're referring to are, again, disclosed in the prior art references that you provide in your declaration?

A Some of them are, yes.

Q And that -- and including specifically the 2003 Southwire reference, correct?

A Southwire is one of those examples.

Q If you now look at Column 2 of the specification. Beginning at Line 24, and this is under the heading Summary of the Invention, the specification goes on to say, To meet -- to meet the needs as described up above, to have a grounding system that is less expensive and which can be installed more quickly and easily, the purpose of

this invention is to provide a grounding system that includes a multifunction line assembly.

Do you see that?

A Yes, sir.

Q And at Line 29 it says, Each conductive mounting assembly is structured to be and is coupled to the multifunction line and to a conductive pile.

Do you see that?

A Yes, sir.

Q At Line 33, beginning with the word "Further," it says, Further, the multifunction line supports the cable hangers, in parentheses, which support the current wires, data wires and other wires, close parentheses; that is, a single multifunction line supports the cable hangers as a messenger wire and provides a current path as a grounding conductor.

Do you see that?

A Yes, sir.

Q So do you understand from that description that the multifunction line that is recited in the '551 patent provides both a support function, by supporting the cable hangers which support the current wires, and also acts as a grounding conductor?

A That is consistent with the definition of multifunctional line that the inventor defines later on that has two functionalities: support and being conductive as a conductive path for the ground.

Q And so when it says -- or, I'm sorry, when you just said "support and being conductive," do you agree that it's being conductive as a grounding conductor as described in the patent?

A It is in the grounding system.

Q Which means that it's a grounding conductor?

A It is a grounding conductor.

Q The messenger cable that is disclosed in the various examples that you provide in your declaration, the prior art examples, those messenger wires are all metallic, correct?

A I can't recall. A messenger wire that is used in a grounding system or it is grounding, it is conductive. Metal is one type of conductor.

Q Would a POSITA understand that the messenger wire in the prior art references that you've included, they were all conductive either by being metallic or some other conductive material?

A If the messenger wire is used as neutral messenger, as I cited several times, or a grounded

messenger wire, it will -- it must be, it will be, conductive.

MR. FLYNN: I'm perfectly willing to keep going. I am going to go into a different area. But just since it's been an hour, and I know you wanted to take a break before, but whatever you want to do.

MR. SWEENEY: How are you feeling? Are you good?

THE DEPONENT: It's up to you.

MR. SWEENEY: How are you feeling?

THE COURT REPORTER: I could use a restroom break.

MR. FLYNN: Sure.

(Recess from 11:37 a.m. to 11:48 a.m.)

Q (BY MR. FLYNN) Dr. Beik, we've given you what has been marked as Exhibit 1003 in this IPR, which is the Grushkowitz reference, correct?

A Yes, sir.

Q Another one of those names I'm not entirely confident that I'm pronouncing correctly, but it's the closest I can do phonetically.

You discuss or you describe Grushkowitz in paragraph -- starting at Paragraph 54 of your declaration, correct?

A That is correct.

Q You understand that Grushkowitz discloses rigid metal cable trays to support electrical wires; is that right?

A Can you point me to it, where it says it, please.

Q Well, let me ask you this question. Have you analyzed Grushkowitz in preparation for the deposition today?

A I have analyzed it.

Q Okay. So do you have a general understanding of what Grushkowitz is directed to?

A I do, sir.

Q And what is that understanding?

A Solar collector cable support tray and support system.

Q Okay. So you understand that Grushkowitz is directed to metal cable trays as part of a support system?

A It's a cable tray system for cables.

Q And they're metal cable trays?

A I can't remember the exact material. I believe metal is one of them.

Q Do you believe that Grushkowitz's cable trays are something other than metal?

A I can't remember the exact material, sir.

Q Would you like to take a look, to refresh your recollection? Actually, if you'd like, maybe I can help you out just by referring you to your own declaration.

If you look at Paragraph 55 of your declaration -- and if you want, you can look at any part of Grushkowitz that you want. But if you look at Paragraph 55 down towards -- four lines from the bottom you say, Grushkowitz further discloses the use of cable trays, mounting brackets, vertical piles and hardware that comprise metal, e.g., steel, aluminum, titanium, et cetera.

A That is correct. Or other conductive material. Sorry. I wanted to complete the sentence. Metal, in parenthesis, e.g., steel, aluminum, titanium, et cetera, or other conductive materials.

Q If you look -- you included Figure 5 of Grushkowitz in your -- well, strike that.

Go to Column 2 of Grushkowitz, Line 15.

A Yes, sir.

Q It states that, An aspect of some of the embodiments disclosed herein includes the realization that a simplified and less costly cable support tray can be made from rolled sheet material, such as galvanized sheet steel.

Do you see that?

A I see this, sir.

Q If you look at Figure 5 of Grushkowitz that you included in your declaration as part of Paragraph 55, what you have shaded in blue and brown -- I'm sorry, what you have shaded in blue depicts the cable trays disclosed in Grushkowitz, correct?

A In Figure 5 of Grushkowitz.

Q Yes, in Figure 5 of Grushkowitz. And you understand that that cable tray as disclosed in Figure 5 is a rigid metal cable tray?

A I don't believe -- that's the statement. I understand it. It says, Includes that simplified and less costly cable support can be made from rolled steel -- rolled sheet material, such as galvanized sheet steel.

I understand that. And that in relation to this sentence, I understand that.

Q That's really all I'm asking you is that what is shown in Figure 5 relates to the metal material that's described in Column 2. Would you agree with that?

A I agree with that and what it describes here.

Q Okay. If you would go, please, to Paragraph 69 of your declaration. The second sentence of Paragraph 69 says, As discussed supra, the definition of multifunction line would include cable trays like those used in Grushkowitz's system.

Do you see that?

A I see this, sir.

Q Where it says, As discussed -- excuse me, As discussed supra -- meaning it was discussed previously in your declaration; is that right?

A (Nodded head.)

Q Could you point out to me where in your declaration that you discuss the definition of multifunction line that would include cable trays?

A I can't remember where exactly it is.

Q Could you -- I looked and couldn't find it, but I thought maybe I might be missing something. Could you take a look to see if you can identify where previous to Paragraph 69 you discussed the definition of multifunction line that would include cable trays?

A This is a large document. I would need to go from the beginning. But your question is that where else other than this, previous to this page, is referred to a multifunctional line?

Q That would include cable trays.

A I have not memorized this. I do not know. It takes me time to go through the whole document.

Q Okay. Paragraphs -- I believe that -- strike that.

Is it correct that it is your opinion that Grushkowitz's cable trays constitute a tension member?

A Grushkowitz's cable tray is supporting cables. It's under tension, thus it is a tension member.

Q Is it your opinion that Grushkowitz's cable tray is a tension member as described in the '551 patent?

A Can you tell me where the '551 patent says tension member?

Q I'm just asking you if that's your understanding, that it is a tension member as described in the '551 patent.

A I would need to refer to where exactly the '551 patent says tension member, please.

Q If you look at Column 2 of the '551 patent.

A Yes, sir.

Q You recall that -- in Column 2, Line 35,

you'll recall that I read to you a little earlier this morning the sentence that says, That is, a single multifunction line provides the cable hangers as a messenger wire and provides a current path as a grounding conductor.

You recall when I read that to you before?

A Are we talking about Page 13?

Q We're back at Smith now -- I mean, we're back at the '551 patent. Are you in the '551 patent?

A Oh, sorry. No.

Q That's what you asked me, right? You asked me where in the '551 patent it talks about tension member?

A You said define tension, and I was asking where. I just would like to be accurate.

Q So now if you go down to that Line 35 again, I'll start over. Of Column 2.

A Please go ahead.

Q You recall a little earlier today I asked you -- or I read to you the sentence from Column 2, Line 35 that says, that is, a single multifunction line supports the cable hangers as a messenger wire and provides a current path as a grounding conductor.

You see that? You recall me reading that to you before, correct?

A I see this.

Q And then the next sentence says, Accordingly, as used herein, a multifunction line means a tension member that supports current wires and/or cable hangers and which is conductive.

Do you see that?

A Thank you for pointing that out.

Q Sure.

So my question to you, then, referring to the Grushkowitz reference is whether it is your opinion that the Grushkowitz cable tray is a tension member as described in the '551 patent?

A My opinion -- a POSITA's opinion is that this is a tension member as described in '551 patent.

Q I'm going to assume that what you meant by that answer is it is your opinion that a POSITA would understand that the Grushkowitz cable tray is a tension member as described in the '551 patent; is that correct?

A That is correct.

Q Okay. If you look at Paragraph 70 of your declaration -- actually, the figure that is at the end of Paragraph 69 of your declaration.

A Yes, sir.

Q Is that -- Figure 8A. That is Figure 8A

of Grushkowitz that you annotated, correct?

A It is part of that figure, sir.

Q It appears that Figure 8A in Grushkowitz includes what you've included in your declaration minus the annotations plus another section below that in the actual Figure 8A that you did not include in your declaration; is that right?

A As I described it under the figure, it says, excerpted and annotated.

Q Okay. So the annotations are your annotations; is that right?

A That is correct, sir.

Q And the -- the annotations in the excerpted Figure 8A in your declaration that refers to -- that identifies "vertical pile" and is labeling "tensile forces" and "cable tray" and "force of gravity," those are all your annotations that are not in Grushkowitz, correct?

A Not in Figure 8A of Grushkowitz.

Q Okay. And in Paragraph 70 of your declaration -- I'm sorry, Paragraph 69 of your declaration you say that, Grushkowitz discloses a metal cable tray which supports current wires is subjected to tensile forces as a result of gravity and the weight of current wire support they're on.

Correct?

A That is correct.

Q And these tensile forces -- strike that.

It's because of these tensile forces that you say are exerted upon Grushkowitz's cable tray that would render, in your view, the cable tray as a tension member as described in the '551 patent; is that right?

A It supports cables, weights of the cables, against the gravity and the pulling force of two sides; therefore, it is a tension member.

Q So that's what I was asking you. In your view, as a result of the tensile forces that you've described, the pulling from the two sides and the force of gravity, that results in Grushkowitz's cable tray being a tension member as described in the '551 patent; is that correct?

A And supporting the weight, correct.

Q And then in Page -- Paragraph 70 of your declaration, you include an annotated Figure 6 from Grushkowitz, right?

A That is correct.

Q Okay. Figure 6 shows, outlined in blue, the Grushkowitz cable tray, correct?

A It shows a cross-section view of that

tray.

Q Yes. And your annotations include the red -- enclosed in red the three cables that are supported by the wire clip; is that right?

A That is correct.

Q And the wire clip is attached to the piece of the cable tray -- is suspended from the piece of the cable tray immediately above, right?

A That is what it shows, yes.

Q And you refer to that component of the cable tray in Paragraph 70 of your declaration as a "support" -- as a "multifunction line supporting cable hanger"; is that right?

A I'm sorry, can you tell me where you're reading?

Q Paragraph -- yes. Paragraph 70 of your declaration that immediately precedes the -- yeah, down there. Yes.

You refer to that -- what you have labeled as the wire clip in the annotated Figure 6, you refer to that as "multifunction line supporting cable hanger"?

A That is not true, sir.

Q Oh, okay. Then I misunderstood that.

So what is the purpose of -- when you say

in Paragraph 70, "Grushkowitz further discloses a multifunction line supporting cable hangers, which I understand would subject cable tray 502 to tensile forces," what are you referring to as the "cable hangers which would subject cable tray to tensile forces"?

A The tray is a multifunctional line. You referred to it as that clip being the multifunctional line. That's what I said that's not true. The tray itself.

Q I see. You're referring to the tray as supporting cable hangers.

A (Nodded head.)

Q And is the wire clip that you have annotated in Figure 6 of Grushkowitz, is that the "cable hanger" portion of that sentence?

A It's a wire clip that holds wire. It's a wire hanger.

Q Okay. So you're referring to that wire clip as a hanger, a wire hanger?

A In this example here.

Q Yes. So if I understand your opinion as you state it here in Paragraph 70, you're saying that that wire clip, under the weight of the cables that it is supporting, that is exerting additional tensile

forces on the cable tray; is that right?

A The cable tray, as depicted in Figure 6, is supporting wires, I refer you to as 5-12, 5-18, 5-606, that's laid down that curves in addition to that clip that carries the wires.

Q Okay.

A It's the whole -- it's not only supporting those wires, as shown in Figure 6.

Q But it's only the wire clip that you're referring to as the hanger; is that right?

A In this example, yeah, but the multifunctional line is that tray.

Q Okay.

A And multifunctional line supports the cables, as I described.

Q So you disagree that the multifunction line, as recited and described in the '551 patent, is a cable-like structure; is that true?

A Cable-like structure is one type, as the inventor in the prosecution history is describing, but it's not the only. As the inventor said, but not limited.

Q So it's your opinion that a rigid cable tray, such as what Grushkowitz discloses, is also a multifunction line as recited and disclosed in the

'551 patent; is that right?

A Point me to the word "rigid" please.

Q Well, assuming that the cable trays in Grushkowitz are made of metal, would you agree that that would be a rigid material?

A What do you mean by "rigid"? Cable is made of metal. Is that rigid?

Q I'm talking -- I'm not talking about cables. I'm talking about Grushkowitz's cable trays, and if those cable trays are metallic cable trays, would you agree that they are rigid?

A What is "rigid," sir.

Q Okay. If that's your answer, then we can move on.

In any event, your understanding of the multifunction line, as recited and disclosed in the '551 patent, is that it doesn't have to be a cable; is that correct?

A That's -- I agree with the inventor. Inventor, he/she/they say, cable, chain, not limited to. It's exemplifying cable and chain as multifunctional line. He/she/they are not limiting it to. I agree with the inventor's statement. It says, a tension used herein. I mean, I -- it's not clear more than this -- it can't be more clearer than

this.

Q I'm sorry, could you tell me where you're reading from, please.

A '551 patent, Column 2. You read it to me. I'm reading it back to you, sir.

Q Yes.

A Column 2, right column, Line 35, 36-ish, Accordingly -- or 37, maybe, as used herein a multifunctional line means a tension member that supports current wires and/or cable hangers and which is conductive.

Sir, that's exactly what Grushkowitz says, a tension member supports current wires or hangers and it's conductive.

The inventor further goes in the prosecution history, says, Example, not limited to cable, chain, tray, in Grushkowitz. I'm in agreement with the inventor.

Q Do I understand you to say that the -- during the prosecution history, that the inventor referred to a tension member as a cable or chain or cable tray, like what Grushkowitz discloses?

A I never said that.

Q Oh, then I misunderstood. From your answer, it's apparent to me that you have analyzed

the prosecution history of the '551 patent.

A I have looked at it, analyzed it.

Q Dr. Beik, we have handed you excerpted portions of Exhibit 1037, which is the file history for the '551 patent, and specifically we've given you -- we've included in this excerpted exhibit, starting at Page 125 up to 30, the final office action. We've also included, starting at Page 136 of 230, the applicant's response and amendment in response to the final office action. And we have included within this excerpted exhibit the appellant's brief on appeal, starting at Page 165 and 230.

Okay. Are these three portions of this excerpted exhibit, were they included in what you analyzed?

A I have looked at these, sir.

Q Okay. So if we can go to the final office action rejection, and if you would -- you understand from that -- and I would just direct you to Page 127 of that first portion of the exhibit.

You understand that the examiner's rejections in the final office action included a 102 anticipation rejection over the Korman reference? If you look right in the middle of the page.

A Sorry, can you repeat your question?

Q Sure.

You understand that as part of the rejection, the examiner found that the Korman reference anticipated the claims of the '551?

A I understand -- unless I have to read it in whole again, I understand that the examiner used Korman as the prior art in the -- in rejecting some of the claims of that '551.

Q Okay. And do you understand that -- what the Korman reference disclosed?

A I have looked at it, sir, and analyzed it.

Q What do you understand is the -- what Korman disclosed?

A Can you please give it to me? I can't remember exactly.

Q Well, let me see if we can do this. Look right below. Look on Page 127.

A Okay.

Q Where it says, Re Claim 1, Korman, et al. disclose.

Do you see that?

A Yes, sir.

Q And you can maybe read that paragraph?

A I was referring to could you -- because

it's referring to some numbers I'm not -- I don't -- can you give me the Korman, please?

Q Really all I want to know from you, Dr. Beik, is if you understand that the examiner rejected the claims of the '551 over Korman and that if you turn to Page 131 -- I'd like to direct your attention to that.

A Okay.

Q Under the heading Response to Arguments --

A Uh-huh.

Q -- in the first paragraph it says, Applicant argues, one, that the specification provides definition for the term "a multifunction line" means a tension member, and Korman failed to disclose a multifunction line.

Do you see that?

A I see this.

Q In the second paragraph it says, With respect to 1 -- that argument that Korman doesn't disclose a tension member -- the examiner analyzed that the weight of Line 60 in Korman, the mass plus gravity, creates weight force which is pulling down on the line between connectors 42 and 43 and this forms a tension line.

Do you see that?

A I read this, sir.

Q And, therefore, the examiner found that Korman was the equivalent of a multifunction line because of the weight force that was created by the mass plus gravity.

Do you see that?

A Without having the patent of Korman to look at what these are, I cannot conclude much from this, sir. I will -- it's -- a POSITA would need to look at that and read this to fully comprehend it.

Q Okay.

A But I understand the text is what you read. But I can't really analyze anything without reading the line that's referring to another document, without that document being present in front of me.

Q But you did that, right? You analyzed Korman?

A I have not memorized it. I have analyzed it.

Q Okay. And you don't recall what specifically Korman discloses?

A Line 60, 42 and 43, where are they? Absolutely not, sir. I did not.

Q Did you also review, look at, analyze the

institution decision that the board entered in this IPR proceeding?

A I have looked at that, analyzed it.

Q I'm sorry?

A Analyzed it.

Q Yeah. Do you recall that the institution decision discusses the Korman reference in this portion of the prosecution history?

A I remember that being discussed in there.

Q Okay. Generally, is it your understanding that in response to the office action rejection over Korman --

A Uh-huh.

Q -- that the applicant argued that Korman --

A Uh-huh.

Q -- was of metallic components and they did not constitute a tension member as claimed in the -- or as recited in the application of the '551 patent? Do you generally recall that?

A I cannot remember, sir.

Q Okay.

A I need the decision, the other one. This does not mean I disagree with you. I just need details.

Q Do you also understand that when the examiner continued the rejection that the applicant filed an appeal brief from the examiner's rejection?

A I believe that was in the prosecution history.

Q And do you understand and recall from your review of the appeal brief that the applicant continued to argue that Korman was not a tension member? Do you recall that generally?

A Unfortunately, sir, I don't recall things. If -- if you can provide me those, I would be more than happy to go through them with you.

Q If you look at the appeal brief, which is part of the exhibit -- the excerpted Exhibit 1037 that we provided to you --

A Which page, sir?

Q If you take that binder clip off, you'll see that there are three separate stapled documents. And it's the last of those documents. Or I guess there are four.

A Four in mine.

Q Yeah. It's the one that says appellate's appeal brief, the one before that.

A Applicant's Brief on Appeal?

Q Uh-huh.

A Yes, sir.

Q Okay. So if you go to Page 9 of that brief, which is Page 173 of 230 in the bottom right corner.

A Which pages, sir? 72?

Q 173 of 230. And in the second full paragraph on that page it says, In this application the term "tension" member is not defined.

Do you see that?

A Yes, sir.

Q Okay. It says, But is used to mean a construct that has a maximum length when exposed to tension but is otherwise substantially flexible, such as, but not limited to, a chain or a cable.

Do you see that?

A Yes, sir.

Q And is that what -- the portion of the prosecution history that you were referring to in one of your earlier answers when you said during prosecution the patent owner said that it included but was not limited to a chain or a cable? Is that what you were referring to?

A In addition to the definition of multifunctional line in the patent itself, yes. I was referring to two matters. One was the definition

provided in the patent by the inventor and the inventor's response, both of them.

Q All right. And now if you would turn to Page 180 of 230, which is Page 16 of the appeal brief.

A Yes, sir.

Q Or actually if you go to the prior -- start at the prior page. It begins a series of bullet points that continue onto Page 16 that describe the Korman reference. Do you see that?

A Yes. Above -- sorry, below Figure 10? Are we looking at the same page?

Q Yeah, the bullet point at the bottom of that page.

A Oh, yeah. Yes.

Q Yeah. And they continue over onto the next page.

A Oh, I see. Yes.

Q And those -- during the first portions of the argument there is a description by the applicant of the Korman reference. Do you see that?

A I'm sorry, which bullet point? Is it the first one you're referring to or --

Q All of them.

A Do you want me to read them?

Q Please.

A This is referencing to figures, numbers and things like that. I need to see those, sir.

Q Now I'm going to direct your attention to the last paragraph on Page 16, or Page 180 of 230.

A Uh-huh.

Q Where it says, Thus -- and this is the applicant's argument on appeal. Okay?

Thus, the text of Korman details how the rigid elements, such as the microinverter case 36, the plug and play connectors 42, 43 and the metallic grounding rail 48, form a grounding path.

Do you see that?

A I see this. I have no idea what it's referring to.

Q And then the next sentence reads, None of these elements are a cable or rope-like construct.

Do you see that?

A I see that sentence.

Q And the next sentence reads, Rather, each of these elements is described as a rigid construct.

Do you see that?

A I can read this.

Q And then it concludes by saying, Moreover, no element identified in Korman is described as a

tension member.

Do you see that?

A I read this, sir. I have no idea what it's referring to.

Q Are you aware, then, that the last section of this excerpted Exhibit 1037 is the notice of allowability of the claims?

A Can you tell me the page number?

Q It's this -- it's the -- this thing that says Notice of Allowability.

A Yes, sir.

Q And do you understand and recall from your analysis of the prosecution history that this notice of allowability of the claims was issued following the submission of the appellant's brief on appeal?

A Uh-huh. Yes.

Q And on -- if you take a look at Page 209 of this portion of the excerpted exhibit, you see a little bit more than halfway down the page it says, The following is an examiner's statement of reason for allowance.

Do you see that?

A I see this, sir.

Q And it reads, The limitation, quote, each said conductive mounting assembly structured to be

coupled to said multifunction line and to a conductive pile, semicolon, and wherein said multifunction line assembly is coupled to and in electrical communication with said number of conductive mounting assemblies of Claim 1, each said support coupling structure to be coupled to a conductive pile, and wherein when said multifunction line assembly is coupled to and in electrical communication with said multifunction line couplings, each said multifunction line coupling defines a conductive path, close quote, of Claim 20 in combination with other limitations present is neither taught nor disclosed in the prior art record.

Do you see that?

A I see this, sir.

Q This was all part of the prosecution history that you analyzed in connection with the declaration that you supported in this proceeding?

A I have analyzed those. But much of the discussion that you referred to, I have no idea because it's referring to pins, numbers, figures that it's not in front of me.

MR. SWEENEY: Is the realtime feed still up for you?

(Pause in proceedings.)

Q (BY MR. FLYNN) Okay. Dr. Beik, we've handed you Exhibits 1005, which is the CAB website reference, and 1006, which is the CAB white paper reference.

A Yes, sir.

Q You begin your analysis of these references on -- in Paragraph 107 of your declaration, correct?

A Yes, sir, Page 68.

Q And Ground 2 of the invalidity grounds is the combination of the CAB website and the CAB white paper, correct?

(Recess from 12:34 p.m. to 12:40 p.m.)

Q (BY MR. FLYNN) Dr. Beik, Ground 2 of the asserted invalidity grounds is based on the combination of the CAB website in combination with the CAB white paper, correct?

A Yes, sir.

Q Okay.

A And further, in the view of knowledge of POSITA.

Q Dr. Beik, is it your opinion that each of the CAB website and the CAB white paper, that each of them discloses all the limitations of the claims of the '551 patent?

A I cannot recall.

Q Okay. Let's take a look at your declaration. Beginning with Paragraph 107, you go through each claim element of the claims of the '551 patent, correct?

A That is correct, sir.

Q Okay. Claim 1A, which is the preamble of Claim 1 of the '551 patent, right? Again, you can just look at your declaration. You set forth under each element what the --

A Yes.

Q So that's the preamble of the -- Claim 1 of the '551 patent, correct?

A I just need to look at the patent --

Q Sure.

A -- sir, to make sure that, like, we are on the same page.

Q Sure.

A That is the pre- -- you called it preamble.

Q Preamble, yes, sir.

A P-M-B-L-E?

Q P-R-E-A-M-B-L-E.

A Thank you.

Yes, that is correct, sir.

Q Okay. And at Paragraph 108 you go through what the CAB website depicts and how that discloses the limitations of claim element 1A, correct?

A It starts from 17 to 18 and analyzes as forth.

Q And at the end of Paragraph 108, you state, Accordingly, the CAB website discloses a grounding system structured to ground the number of cables supported by a support assembly.

Do you see that?

A Yes, sir.

Q And in Paragraph 108, you state that the CAB website depicts all the other limitations of claim element 1A in terms of the number of cables supported by a support assembly, space conductive piles, correct?

A Essentially, I describe what is shown.

Q And it's your opinion, then, with respect to claim element 1A, that the CAB website itself discloses all the limitations of 1A, correct?

A 1A. So 1A, like --

Q Do you see how you -- just to refresh your recollection as to how you did your declaration, do you see how you start out in Paragraph -- right above Paragraph 107, you start out with Claim 1A?

A Yes, sir.
Q And then if you go over to Paragraph 113 and you do claim element 1B. Do you see that?
A Correct. From 17 to 112 is the analysis of 1A and in this whole section --
Q That is correct.
A -- I provide description of what it is --
Q Right.
A -- with regards to 1A, not only 108, the whole section, 17 to 112.
Q Yes. So my question to you is, if you go -- because starting at Page -- at Paragraph 109, you start referring to the CAB website -- the CAB -- I'm sorry.
At 111, you start referring to the CAB white paper. Do you see that?
A I see this.
Q So in Paragraphs 107, 108, 109 and 110, you're talking about what the CAB website discloses in your opinion, correct?
A As I do in 111, middle of the page.
Q Okay.
A So it's not expressly in those. All's -- simply put, 107 to 112 discusses white paper and website, as per Claim 1.

Q Then here's what I'm going to ask you, and if you need to review those paragraphs for claim element 1A, please feel free to do so. What I'm asking you is if you -- if it's your opinion, as set forth in those paragraphs in your declaration, that the CAB website by itself discloses all the limitations of 1A and then whether the CAB white paper also discloses all the limitations of 1A. That's what I'm asking you.

A I can provide an answer to that without reviewing. CAB website, reading with the knowledge of POSITA, it discloses the claim elements of 1A, and that's what I've stated in 1A.

Q Okay. And is it, then, also your opinion in those paragraphs that the CAB white paper separately discloses the elements and limitations of 1A?

A With the knowledge of POSITA.

Q Yes, sir.

A Yes.

Q So there is nothing that the CAB website fails to disclose of 1A that you rely on the CAB white paper to disclose; is that correct?

A I am not sure. White paper, as directed by the website, is a part of the website and its

website says, Go there to see how we are NEC-compliant. I would be highly encouraged to do that.

Q Okay.

A This is Page 5.

Q All right. That's not quite the question I asked you. So if you just look at Exhibit 1005, which is the CAB website --

A Uh-huh.

Q -- and without looking at the CAB white paper -- I understand that the CAB white paper is referenced on the CAB website, but without looking at the CAB white paper and you just look at Exhibit 1005, is it your opinion that 1005 by itself discloses the limitations of 1A?

A With the knowledge of the POSITA --

Q Yes.

A -- combined with that --

Q Yes.

A -- a POSITA would come to a conclusion that 1A is described -- is covered, those two elements.

Q Okay. And so in the same vein, is it your opinion that the CAB white paper, with the knowledge of a POSITA, discloses all the limitations of 1A,

Exhibit 1006?

A Using CAB white paper and POSITA's knowledge, a POSITA would come to a conclusion of Claim 1.

Q Okay. And so rather than going through claim by claim by claim element, is it your opinion that with respect to all of the claim limitations, that the CAB website, Exhibit 1005, with the knowledge of a POSITA, discloses all of those claim limitations?

A A POSITA, with the CAB website and his/her/their knowledge, would come to those conclusions.

Q And is it also your opinion that the CAB white paper, Exhibit 1006, with the knowledge of a POSITA, discloses all of those claim limitations?

A A POSITA would come to claims -- conclusions using their knowledge and the concept paper.

Q Dr. Beik, would you turn back, please, to Paragraph 58 of your declaration.

Okay. And Paragraph 58 is referring to the CAB website, Exhibit 1005, correct?

A That is correct, sir.

Q Okay. You state in Paragraph 58 that the

CAB website, Exhibit 1005, includes information regarding various grounding and support assemblies offered by CAB.

Do you see that?

A That's what it states, sir.

Q Okay. Could you show me where in CAB -- I'm sorry, where in Exhibit 00 -- where in Exhibit 1005, the CAB website, it discloses or references anything about a grounding assembly?

A I'm sorry, can you repeat your question?

Q Sure.

Can you show me where in the CAB website, Exhibit 1005, it discloses anything about a CAB grounding assembly?

A Going through CAB -- let me select one of these. Page 5, for instance, I can go through --

Q Page 5?

A Page 5 of evidence -- or Exhibit EX1005 -- this is just an example, the top or middle of the page --

Q Are you looking at this? Is that what you're looking at?

A Yes. These two figures, Page 5 of 21.

Q You know what? My page number is cut off. That's why I'm --

A Oh, I'm sorry.

Q But that's okay. I can find that easily enough.

This is it?

A That appears to be it.

Q Okay.

A Looking --

Q Go ahead.

A Looking at this page, a POSITA would understand that this is a professional installation at a solar power plant. A POSITA would understand that those -- there are cables with insulation hanging from a messenger wire with a number of hangers.

The POSITA would understand those cables are current-carrying cables. There would be current-carrying cables. A POSITA would understand that bare wire off of which the hangers are hanging is a messenger wire. A POSITA would look at -- the bottom picture, would see that messenger wire, it's connected to a pile via a mounting structure, if you wish.

A POSITA would know this professional installation would require a grounding system. A POSITA would see that there are no other grounding

system in this than that messenger wire, which appears to be galvanized steel or some sort of steel, conductive through conductive brackets or mounting assembly through conductive piles. A POSITA would conclude this is a grounding system in the absence of everything else.

Further, within the same page, a POSITA would understand, since this is a commercial product, it has to be NEC or certified, and would look at the top of the page, that it says -- CAB directs the POSITA, Go and read our concept paper. A POSITA would conclude that that messenger wire connected to the pile through that mounting assembly are all conductive and as part of the grounding system.

Q Do I understand from your answer that a POSITA would conclude that the messenger wire that appears to be of galvanized steel --

A Some sort of steel.

Q -- some sort of steel, that it would be acting as a grounding conductor that provides the effective ground fault current path that we've talked about earlier today because a POSITA does not see in that photo any other wire that would be acting as a grounding conductor?

A That's one of the reasons.

Q And then what are the other reasons?

A The white paper, concept paper, that is referenced --

Q I'm just talking about the website right now.

A I am purely talking about website, sir.

On top of that picture, it says, CAB provides high-quality cost-effective wire management solutions. We include here a requirement of 2014 updated NEC as it relates to CAB cable rings and saddles.

It states, 2014 NEC. There is no reason to put that there if they wanted to say, We are not compliant, we are not safety compliant. It is a professional installation. The CAB is directing you to -- I would argue that the concept paper is not part of the website. It's there. It is in the website. It's just one click away. What's the difference between that concept paper and a tab that you go and click on. Both of them you have to click on.

Q Okay. I just want to make sure I understand what you're saying. I think I understand that what you're saying is, because the website includes that image of the white paper and because

the website references the requirements of the 2014 NEC --

A That's the second reason.

Q -- that because it references that a POSITA would understand that this installation would comply with NEC requirements; is that correct?

A It's the second reason for a POSITA concluding this professional installation has a grounding system, and that messenger wire through that pile is the grounding system, thus --

Q When you say "the grounding system," the grounding conductor?

A Part of the grounding system. Thus, my statement in Page 39, Paragraph 58 includes information regarding various grounding and support assemblies offered by CAB.

Q Okay. Again, I just -- it's important so I want to make sure I understand it correctly. Okay?

So I think you've offered two reasons as to why the CAB website discloses that the messenger wire, the steel messenger wire depicted on the website would be acting as a grounding conductor.

The first reason is because there's nothing else in the photo on the CAB website that would be a separate grounding conductor. That's one

reason, correct?

A Yes. Combined with the bracket --

Q The second reason -- I'm sorry. Combined with?

A With the bracket and the pipe. That's a conducting path. No other elements in terms of a ground. As the inventor describes in '551, it says, Adjacent to -- if I'm not -- no. Adjacent to -- you read it to me, sir.

Q Yes.

A I want to make sure that I don't --

Q Adjacent the messenger wire.

A Yeah, I don't want to misquote.

Q Uh-huh.

A Okay. Page 12 of the '551 at the Column 1, the very last line, it says, This is why a conductor or grounding wire is disposed adjacent -- this is -- the messenger wire.

And you presented to me Exhibit 2005.

Q Yes.

A An example of which --

Q Yes.

A -- I don't see there.

Further, I see down there something that's another example that it doesn't have this. So a

POSITA would know that this is an industrial, professional installation. Must be a ground. The inventor himself/themselves/herself discloses that, Hey, if you have a ground it's going to be next to a messenger. It's not there.

The only thing that a POSITA sees, professional installation, must be grounded, it is NEC compliant. It references that. Messenger wire must be the ground conductor or a part of the grounding system, the grounding conductor through the -- that bracket and pipe.

Q Okay.

A And that's what I have stated in 58.

Q Okay. So that's the first reason that you explained.

And then the second reason you explained, if I understood correctly, was that the CAB website also refers to the NEC.

A Correct.

Q And because it refers to the NEC, a POSITA would understand that the installation would comply with the NEC; is that correct? Do I understand that correctly?

A That is correct.

Q Okay.

A Through that concept paper. The concept paper is a part of website.

Q Okay. Other than what appears to be a steel messenger wire as shown in the CAB website, what else can you tell me about the properties of the messenger wire depicted?

A I'm not sure if I understand that. Can you, like, describe more?

Q You remember earlier today in our deposition I was asking you various questions about whether metal components connected to each other and then to the earth, whether that would be sufficient to provide an effective ground fault current path.

And you told me that you would need to know a lot more information. You'd need to know more about the properties of the metallic components or the components. You'd need to know things even like humidity. If we were talking about the pile, the resistance of the pile, the dimensions of the pile and all these other details.

Do you recall all that testimony this morning?

A I recall your hypothetical question --

Q Yes.

A -- where I needed details to know.

Q Right. So I'm asking you, from what you can see of the messenger wire depicted on the website, assuming that it's a steel messenger wire, what of those kinds of details can you ascertain from the website about the messenger wire, other than it's steel?

A This is not a hypothetical case. It's a professional installation. It must conform. It does conform to all those requirements. It provides low resistance path for that system. Otherwise, it would not be a professional installation that passes the requirement and NEC.

All those information is imbedded in this.

Q Okay. Dr. Beik, are you aware of whether what's shown on the CAB website, Exhibit 1005, is an actual installation?

A This appears to be a professional installation.

Q This was -- this is a depiction that was on the CAB website, correct?

A I see a number of these throughout their website.

Q Did you make any effort to determine whether what's depicted on the CAB website is an actual installation?

A When I reviewed this, sir, there is a number of stamps on it.

Q Which stamps are you referring to?

A From the first page, Solar -- Intersolar Award 2004 finalist. And Page 3. You continue to Page 4, on left side it's a stamp with something else. Bottom, the same.

And a POSITA would assume that these are actual. These are not animations. These are not drawings. These appear to be pictures of installations.

Q And your conclusion that a POSITA would understand these not to be animations or drawings but an actual installation is based on the stamps on the pages that indicate Solar AWARD finalist on the third page, also on the fourth page?

So a POSITA, looking at that and seeing those, would understand that this is an actual professional installation; is that correct?

A And what's -- we can go through to see where it references it. But on Page 3 they said CAB cable rings and saddles for PV ground mount cable management were selected as a finalist for the Intersolar AWARD 2014 photovoltaics category, right beneath that.

What would be the reason to put that statement there right beneath the picture? Is that not their system? That would be their system. I have to go through it to exactly know where else it refers to. But the POSITA --

Q Well, I would actually ask that you do that. I'd like you to show me all the things that you would point to that would support your opinion that a POSITA would understand from what's on the website that this is an actual installation.

A So Page Number 3. The first picture, under that it says, Copyright 2014. If it's an animation -- Page 3 of 21.

Q Yes.

A Light white --

Q Oh, I see. Yes.

A It says, C -- I understand "C" stands for some sort of a copyright -- 2014 Cambria County Association for the Blind and Handicapped. So this is -- it tells me that this is their copyright. So this is theirs. I can't imagine that this would be not an actual stamp with an Intersolar AWARD 2014 finalist.

Bottom of the same page. On the left, it describes a winning -- winner of that award. Same

award, or same year, of a hanger. I have no reason to doubt that this is not the real system in the field.

Page 4. On top of the page, again, it's on the left -- on the top left and right, it's stamped with awards that they have won. CAB's high-performance coating is applied a hundred percent of the surface -- it reads under those two pictures here. And I see on the left side it's a hundred percent coated hangers. This must be referring to that; otherwise, there was no reason to put a picture like this.

There is -- there are indications that this is a real installation. Go to the next page.

Again, Page 5 that we discussed at length. The top picture has a stamp. It says, Copy -- it doesn't say -- it says, C, which stands for copyright, 2014 Cambria. So it's copyright. So it should be a real -- a conclusion of POSITA would be this is a real installation, a picture of a real installation.

Under that picture, in the parenthesis it says, Pictured CAB Number 8944 PVC coated cable rings and saddles. If it was not real, they would not code it here and said this picture.

Again, Page 6, another CAB number. It states that.

Q All right. Are you referring to the copyright? Is that what you -- on Page 6?

A On Page 6 --

Q Oh. The CAB Number 8944. I see.

A That's right. And then bottom orange is the copyright, that all the rights --

Q Uh-huh.

A A POSITA looking at this would come to a conclusion that this is a -- this is a real product. This is a real installation. This is not -- this is real, what it's presented here by all these signs.

Further, their concept, their white paper, which is a part of the website, it's just one click away. What's the difference between clicking on that concept paper or clicking on one of these tabs? No difference. You're clicking. It's a part of the website.

Further, there is tabs here: About Us, CAB Products. Like, this is a real website offering real product, with the real numbers, with the copyrights and images.

We can continue if you wish.

Q I would.

A The CAB brochure in the middle of Page 15 depicts a similar picture and offers, Click for ring and saddle sizing and package information. Click for safe working loads, spacing and other data. Click for request for more information, for free samples. Click for CAB cable rings and saddles in solar application sales sheet.

And the sales sheet, the first page is actually the same picture as above that, in this. Further, Page 20 says, CAB solar spacing recommendations. It says, Click here to read the concept white paper.

These are an indication that this is a real website. These are real products. Those are copyrighted images of installations that CAB claims to be NEC compliant.

Q Is that everything in the CAB exhibit, 1005 -- in the CAB website, Exhibit 1005?

A I don't believe it's everything. That's what I -- for now. I could look at it.

Q Well, for now is -- we're here for now. So if there's more, I'd like you to point it out to me.

MR. SWEENEY: Objection. Form.

Q (BY MR. FLYNN) I withdraw that statement.

Dr. Beik, I would like you to, again, take whatever time you need to look through Exhibit 1005 and identify any other place that you can see in that Exhibit 1005 that would inform a POSITA that what is depicted on those pages is an actual solar plant installation.

A This picture on Page 5, solar panels, cables, saddles, those -- those are a professional picture of professional installations. They're referring to that NEC code. This would be a system that complied. That's sufficient for a POSITA to understand that wire -- I don't need to -- a POSITA would not need to understand more than what we are -- this is the subject of the discussion. Where is the ground in this?

Q Dr. Beik, would you expect -- strike that.

In your opinion, would a POSITA expect -- if this were a real solar plant installation, would a POSITA expect to see other types of cables coming off of the solar panels, other than what's shown in this picture on Page 5?

A I'm not sure if I understand that, sir.

Q What page -- what cables -- in a solar plant installation, what cables would be coming off of the solar panels?

A DC cables, AC cables, sensors, controls. Those are examples.

Q Are you familiar with the term "string cables"?

A Can you explain what you mean by that?

Q I'm asking you if you -- if you have an understanding as to what that is referring to.

A It's a general word. I need more information to understand what it means.

Q Do you have an understanding of the term "feeder cables"?

A Again, this is -- feeder cables are general cables. You can call -- what you call as a feeder cable.

Q Do you have an understanding in a solar plant installation that there would be wires coming -- attached from the solar panels or the bottom of the solar panels that would feed into the other cables that are coming off the panels down the line, as it proceeds down the line?

A I'm not sure what you're referring to, sir. Can you be more specific?

Q You personally have not been, ever, to a solar plant installation, correct?

A That is correct, sir.

Q Other than looking at the CAB website and pointing to all the things that you've pointed out to me today, have you made any other attempt to ascertain or to confirm that what's depicted in the CAB website, Exhibit 1005, is an actual solar plant installation?

A I do not remember. I do not know if this is an actual installation. It's a professional installation. It's a picture of a professional installation.

Q What distinction are you drawing between an actual installation and a professional installation?

A It shows a system that has cables, feeders, that they have installations. A POSITA would know these are cables coming off solar panels. It shows them behind the picture, there are solar panels. A POSITA would conclude these cables are from solar panels.

So this -- the POSITA would conclude that these cables are supported by a messenger wire made of steel, some sort of steel, connected with some sort of steel brackets to a steel pile. A POSITA would conclude this is the path for the ground current. There is no other ground current. The

inventor says it should be adjacent if it exists.

Exhibit 2005, sir, I have no way of verifying that's an actual installation, but it looks a professional installation. You showed that to me, the same way that I concluded that -- I conclude this is a professional installation. I have no way of verifying what you showed me is an actual installation.

Q Dr. Beik, have you ever heard of companies erecting mockup portions of a solar -- solar plant installation?

A Prototyping, what we call, it's common in the field. I don't know what you're referring by "mockup."

Q If a company promoting its products set up a mockup in the field, meaning not an actual solar plant installation, but just a mockup of it or a portion of that, would you be familiar with that practice?

A I don't know.

Q If that kind of thing did happen, a company would just set up a mockup, a portion of an installation to promote their products, would you expect that the mockup wouldn't show everything of what an actual complete solar plant installation

would entail?

A I would look at the purpose of a mockup. If the mockup is to present a working system, we are talking about grounds. It has to have ground. It tested for it, ensured that the system is safe.

If the mockup is for studying the color of the cable. I would need to know what is the purpose of the mockup.

Q Exactly.

Okay. One last question about Exhibit 1005. The word "grounding" or "ground conductor" or "grounding conductor" or "grounding system" nowhere appears in Exhibit 1005, does it?

A I don't know.

Q Would you look again at Exhibit 2005, please.

A Yes, sir.

Q And on the top half of that, what CAB labels as its standard system that includes a separate grounding conductor and grounding splice. Okay?

A Uh-huh.

Q Looking at just the steel messenger wire connected to the metal clamp and metal bracket and to the metal pile --

A Uh-huh.

Q -- and the metal pile being imbedded into the earth --

A Uh-huh.

Q -- if that separate conductor and grounding splice weren't present --

A Uh-huh.

Q -- and it was just the messenger wire and the clamp and the bracket and the metal pile, would that be enough information, for you, to tell you whether that messenger wire has all the properties necessary to be a grounding conductor that provides an effective ground fault current path?

A In this photo, which is of one pile, one system, as you referred to it could be a mockup, is different from the picture in 1005, which shows a number of systems.

In this picture, if there was no ground system, a POSITA would conclude that the messenger wire has the properties of being a part of a ground system.

Q And is that the same thing as saying, in this picture, if it didn't show a separate grounding conductor and ground splice, that a POSITA would understand that the steel messenger has the

properties necessary for it to act as a grounding conductor that provides an effective ground fault current path?

A It would need to have -- if there is no ground system in the -- a separate ground system, a safe system would need to have a ground -- a grounding mechanism. In the absence of a ground -- separate ground conductor, a messenger wire would operate as a ground conductor as part of the grounding system.

Further, as explained by the inventor, the separate grounding conductor would need to be close to the messenger wire. If it's not, then that messenger wire must be a ground -- part of a grounding system, thus grounding conductor.

Q So, again, just to make sure I understand your answer, if in the top left picture of Exhibit 2005, if that copper conductor and that grounding splice weren't there, a POSITA would conclude that the steel messenger wire itself would be the grounding conductor that provides an effective ground fault current path; is that correct?

A It would be a part of the grounding system, thus a ground conductor, like the picture below it. That picture exactly shows there is no

separate grounding conductor, thus it is a grounding conductor. That messenger wire is a grounding conductor, part of the grounding system.

Q You're aware that in solar plant installations, actual solar plant installations, that inspectors would come and inspect the various components of the installation, including whether or not it is properly grounded, are you not?

A A system would need to pass safety requirements. Whether that includes in-person inspection or not, I don't know.

Q Do you know what an AHJ is?

A Can you describe the whole --

Q Sure.

Have you heard the term of "authority having jurisdiction"?

A I don't remember.

Q Okay. If you would look at Page -- Exhibit 1006, please, which is the CAB white paper.

A Which page, you said? Page 6?

Q Exhibit 1006. I just want you to look -- I just want to get that in front of you first.

A Okay.

Q Dr. Beik, do you know what the purpose -- well, first of all, do you know who prepared the CAB

white paper?

A I can't recall.

Q Would you look at Page 3 of Exhibit 1006, Page 3 of 17.

A Uh-huh.

Q Looking at that page, does that refresh your recollection of who prepared the CAB white paper?

A It states, Brooks Engineering, prepared by Brooks Engineering.

Q Do you know who Brooks Engineering is?

A I do not know, sir.

Q When you reviewed or analyzed the CAB white paper, did you make any attempt to find out who Brooks Engineering was or anything about them?

A I cannot remember, sir.

Q Do you know what the purpose of the CAB white paper was?

A It describes, A Review of Requirements in the National Electrical Code and How CAB Cable Rings and Saddles Meet These Requirements.

Q Do you know what "CAB cable rings and saddles" is referring to?

A Some of them are in this exhibit and on their website.

Q Do you understand that the CAB cable rings and saddles are a type of hanger that CAB is selling?

A I understand some of them are.

Q Is there anything that you recall seeing in that CAB white paper that talked about CAB's grounding system and whether it met the requirements of the NEC?

A I don't remember all of it, but this discusses how CAB complies with 2014 NEC. There are somewhere within this that discusses grounded messenger wire or cables. I would have to read it.

Q I'm going to take you to that page --

A Uh-huh.

Q -- but, again, the title of the white paper, as you pointed out, is How -- A Review of Requirements in the National Electrical Code and How CAB Cable Rings and Saddles Meet These Requirements.

Correct?

A That is the title.

Q There's nothing in the CAB white paper that you read that discusses how any grounding system that CAB utilized meets NEC requirements, is there?

A As I discussed, it discussed grounded messenger wire. A POSITA would know, NEC, it's not only a portion. It discusses the entire grounding

system. So it would assume that this is a safe system or design meeting all the requirements of NEC, including grounding.

Q Would you go to Page 14 of 17 of the CAB white paper, please.

A Yes, sir.

Q At the top of that page is the heading Grounding and Bonding of Cable Supports. Do you see that?

A Yes, sir.

Q Do you understand what "cable supports" is referring to?

A I believe so.

Q What do you believe it's referring to?

A The system that supports cables, current-carrying cables.

Q Do you have an understanding that it's specifically referring to the cable hangers that are supporting the current cables?

A Cable hangers by themselves aren't able to support current-carrying cables. They are hung, as shown in this Figure 5, from a messenger wire.

Q So then your understanding of when it says Grounding and Bonding of Cable Supports, you understand that that's referring to the hangers and

the messenger wire?

A It's the cable support system, whatever supports the cable. Piles also support the cable, support the hangers that support the cable.

Q Is there anything about piles in here?

A No. A POSITA would know, to support the cable, you don't -- you need a system. It's not one element.

Q There is a picture on this page of the white paper that shows a messenger wire with a cable ring and a saddle suspended from the messenger wire, correct?

A That's what the cable shows -- picture shows.

Q And it's your understanding that the cable ring and saddle that is suspended from the messenger wire is supporting a current-carrying wire?

A A POSITA would conclude that those are -- those would be current-carrying cables.

Q Immediately underneath that picture, when it resumes in the text, where it starts with, Some AHJs -- do you see that?

A (Deponent nodded head.)

Q It says, Some AHJs may request that exposed metal rings and saddles be evaluated for

bonding.

Do you see that?

A Yes, sir.

Q It continues on to say, But this is not well substantiated in the NEC, nor is there a UL standard for evaluating such equipment.

Do you see that?

A Yes, sir.

Q And you understand that that sentence is referring to the exposed metal rings and saddles, correct?

A That's what it says.

Q Which are the hangers that are suspended from the messenger wire in this photo, correct?

A That is correct, sir.

Q The author of the white paper then talks about or quotes the NEC. And then after quoting the NEC indicates, Clearly damage to the cable is the issue. And he's talking about damage to the current-carrying cable, correct?

A That's a fair assumption.

MR. SWEENEY: Objection. Form.

Q (BY MR. FLYNN) And he says, Given this line of reasoning, a cable hanger or similar fitting, such as CAB cable rings and saddles, could be

installed without a listing for bonding and grounding.

You see that, correct?

A I see this.

Q And your understanding and your opinion is that a POSITA would understand that that sentence is still referring to the CAB cable rings and saddles and whether they would require a listing for bonding and grounding, correct?

A I see this.

Q And then it says in Figure 5, which is the photo in the middle of the page, The hangers are actually in full contact with a grounded steel messenger wire.

Do you see that?

A Yes, sir.

Q And then finally it goes on to say, It could be argued that even if the conductor insulation were ever to be damaged, the cable rings and saddles would stay at or near ground potential. Correct?

A That's what it reads.

Q And is it your understanding and in your opinion would it be a POSITA's understanding that what this portion of the white paper is describing is that if there were damage to the insulation on the

cable such that there was direct contact between the metal ring and saddle and the metal messenger wire, and the messenger wire became energized, that that could present a safety or shock hazard?

A It does not explain safety or shock here.

Q And you don't understand and it would not be your opinion that a POSITA would understand that that's the issue that this is discussing?

A A POSITA would conclude that this could make the messenger wire carrying current be in danger or -- the other one you called?

Q A shock hazard.

A Shock hazard. I can't know. I wouldn't know that that makes the current live -- makes the wire live to some extent.

Q And then the sentence that says, in Figure 5, The hangers are actually in full contact with a grounded steel messenger wire, such that even if the conductor insulation were ever to be damaged the cable rings and saddles would stay at or near ground potential.

Do you understand that to mean and do you believe that a POSITA would understand that to mean that if the metal ring, a ring and saddle became energized because the insulation on the

current-carrying cable was damaged, nevertheless it would not present a safety or shock hazard because it would still be in full contact with the messenger wire that is grounded?

Do you understand and do you believe a POSITA would understand that that's what this portion of the white paper is describing?

MR. SWEENEY: Objection. Form.

A This portion clearly states the messenger wire is grounded. This portion does not talk about safety, shock, hazards or any of those matters.

Q (BY MR. FLYNN) Do you believe that the reference to grounded steel messenger wire in this portion of the white paper would indicate to a POSITA that the messenger wire, as shown, is a grounding conductor that provides an effective ground fault current path?

A A messenger wire conduct -- being conductive and part of a grounding system at the time of fault would conduct current, but not in normal condition.

Q My question is, is it your opinion that the reference to a grounded steel messenger wire in this portion of the CAB white paper would indicate to a POSITA that the messenger wire is acting as a

grounding conductor that would provide an effective ground fault current path?

A In this picture I don't see any other grounding conductor. The only con -- bare wire that I see is a messenger wire that is grounded, hence is acting as part of the grounding system.

Q And as you testified throughout the day, and as part of the grounding system is acting as a grounding conductor?

A That is correct. It conducts a ground current when a short-circuit happens.

MR. SWEENEY: Is this a good time?

MR. FLYNN: We're getting close to wrapping it up, but let's take a break and I can look at my notes for the last section of this. And it should go pretty quickly from here.

(Recess from 1:43 p.m. to 2:05 p.m.)

Q (BY MR. FLYNN) Okay. Dr. Beik, we're getting close to wrapping up. We're showing you now what has been marked as Exhibit 1004, which is the Petersen reference. This is a patent from back -- issued back in 1961. This is, of course, one of the references that you have analyzed in connection with your opinions in this matter, correct?

A That is correct.

Q And it is one of the -- it serves as the basis for one of the invalidity grounds that have been asserted against the claims in the '551 patent, correct?

A That is correct, sir.

Q Okay. Dr. Beik, would you please turn to Paragraph 173 of your declaration. Actually, before you do that, before I ask you specifically about that paragraph I just want to identify some of the elements of the Petersen reference.

The Petersen reference -- Petersen discloses a neutral messenger cable 37, if you look at the figures, particularly 1 and 4 on the face of the Petersen patent. And if you need to, also I can show you or direct you to the portions of the specification that refer to the neutral messenger cable 37. But are you --

A Yes.

Q Okay. So what's shown in Figure 4 there, I think what you're pointing to is what's denoted as 37, is the neutral messenger cable that you are -- that is your opinion is the multifunction line as claimed in the '551 patent. Is that correct?

A That is correct.

Q Okay. And then the -- there's the aerial

cable means 35 that's also shown in Figures 1 and 4 of Petersen, correct?

A That's one of the aerial cables.

Q Yes. And that aerial cable is supporting three separate conductors in spaced relation from one another, correct?

A Can you repeat what you stated?

Q Sure. That aerial conducting -- aerial cable means 35 is supporting three separate conductors that are spaced apart from each other?

A Can you show me where it says that?

Q I'm asking you to look at the -- you see where it's the aerial conductor means 35?

A I see this, sir.

Q Aerial cable means 35?

A Yes, sir, I see this.

Q Okay. And do you see that the aerial cable means 35 is what's supporting the three conductors?

A Aerial cable is supporting three -- can you show me the text, sir?

Q Sure.

A Need to see the text.

Q Look at Column 2 of Petersen.

A Yes.

Q And go to Line 41. It says, As shown semi-diagrammatically in dashed lines, the aerial cable means 35 comprises a plastic member, which is adapted to confine and hold the three conductors 36 in spaced relation.

Do you see that?

A Aerial cable means, yes. You were referring to aerial cable supporting others, and that doesn't show it. 35 is an aerial cable means --

Q Yes.

A -- that's supporting three aerial cables.

Q Yes. Okay.

A Yes.

Q We're on the same page. All right.

The -- that aerial cable means 35 that is supporting those three aerial cables is what you are pointing to as the hanger in Petersen, correct?

A It's a type of a hanger.

Q Yes. Aerial cable means 35 that supports the three aerial cables is attached to and supported by clevis 19, correct?

A That is correct.

Q Dr. Beik, could you explain how in your opinion neutral messenger cable 37 supports cable hangers and/or current wires as a messenger wire?

A So can you repeat your question?

Q Yes. Can you explain to me how neutral messenger cable 37 in Petersen supports cable hangers as a messenger wire?

A Can you show me -- you're referring to my declaration? Can you show me where it states, please?

Q Well, that's a good point. I don't know that your declaration actually states that, so maybe I should back up and ask the question. I think I already did ask the question.

It is your opinion that neutral messenger cable 37 is the multifunction line claimed in the '551 patent, correct?

A This acts in Petersen as -- fits in that description --

Q Yes.

A -- of '551 --

Q Right.

A -- as messenger wire -- as multifunctional line.

Q Is it your opinion that neutral messenger cable 37 supports cable hangers as a messenger wire?

A Messenger -- a POSITA would know 37 supports the cables as they extend, referring to

Figure 4. As they extend along the way, it supports the -- those cables with a hanger type.

Q On what basis do you say that a POSITA would understand that neutral messenger cable 37 supports the hangers along the way?

A These cables that go from the pole -- between two poles, they need to be supported.

Q You're talking about the three aerial conducting cables that are --

A The current cables. These three conductors, 36 that it's pointed at, Figure 4, extend between two poles.

Q Yes.

A They need to be supported.

Cable 37 would act as the messenger wire that supports them in addition to B, ground -- acting as a ground wire.

Q How is neutral messenger cable 37 supporting aerial cable means 35?

Let me re-ask the question.

How does -- in your opinion, how does neutral cable 37 support the three aerial conductors as they extend from pole to pole?

A There would need to be hangers hang- -- hung from 37 holding the three 36 wires.

Q You mean hangers in addition to the aerial cable means 35 that is shown in Figures 1 and 4 or are you referring to aerial cable means 35?

A It is not shown, the type of hangers, but from one pole to another, there -- a POSITA would know there must be a support that holds these cables to that messenger wire 37.

Is it the same as means 35 or is it different? I would not know. But a POSITA would know between two poles, you need a support system.

Q As shown in Figure 4, aerial cable means 35 is not supported by neutral messenger cable 37, is it?

A It's an extension from the pole.

Q Aerial cable means 35 is supported by clevis 19, correct?

A Correct.

Q And clevis 19 is an extension from the pole or is part of the pole?

A I don't know if it's a part of the pole or not. This attachment attaches to the pole.

Q Okay. But as shown in Figures 1 and 4, aerial cable means 35 is not supported by neutral messenger cable 37, correct?

A In this embodiment, I don't see that.

Q And where would you be pointing to in Petersen that tells you that the conductors as they are proceeding from pole to pole would in between the poles be separately supported by hangers that would in turn be supported by the messenger cable?

A As I described, a POSITA would know that cables need to be supported the same way that the inventor of '551 declared, the same way that Grushkowitz declared. You need to support cables. Between these two poles, there will be -- a POSITA would conclude that there will be these aerial cables supported by that messenger wire through a hanger, something that can hold those to the messenger wire.

Q You would agree that Petersen does not discuss or disclose in any manner that the aerial conducting cables that are supported by aerial cable means 35 are further supported between poles by other kind of cable hangers. Petersen doesn't disclose that anywhere, correct?

A As I described in my declaration, that's -- a POSITA's knowledge would conclude that between two poles the cables are under tension. I have described this at length. That tension, the forces that we went through, the tensile force, the gravity is going to pull the cables down.

Q Could you show me where in your declaration, in your analysis of Petersen, you refer to any cables extending from pole to pole that would further need to be supported by something other than what Petersen discloses?

A Page 27 of my declaration, Item 43.

Q Paragraph 43, is that what you said?

A Yes, sir. Page 27 and Page 28, I show and I analyze my declaration.

Q Would the need to support the conductor cables between poles depend on the spacing between the poles?

A As described in Page 27, the length of the span, the load the support is supporting, the strength of the material measured as elastic modulus and the momentum of inertia, not only that, but these four elements.

Q Is there anything -- so I take it from that answer that you agree that the need to support the cables between poles depends, at least in part, on the span between poles, correct?

A That is correct.

Q Is there anything in Petersen that discloses what the span is between one pole and another?

A A POSITA would know that you have distances between the poles; otherwise, it beats the purpose of having poles if you put it every inch or every feet.

Q Is it your testimony that in every installation that uses poles, that in addition to being supported at the pole, there will be additional hangers that support the conductors between poles?

A That's a general statement. A POSITA would know in the field, in power systems, the cables between the poles require support. The question is how much support. And how to calculate that, I describe it here.

Q Is there ever an instance where conductors that are supported by some mechanism, such as Peterson's aerial cable means 35 at the pole, are not further supported by hangers in the span between one pole and another pole?

A I do not know. I refer you to Exhibit 1005, the CAB website. Look at all the poles. How is cable supported -- current-carrying cable supported between the poles? Those are called hangers.

Q Again, the question I asked you was, is there ever an instance where conductors that are

supported by some mechanism, such as Peterson's aerial cable means 35 at the pole, are not further supported by hangers along the span between poles, and your answer was, I don't know.

A I do not know. I know a POSITA would know current-carrying cables between two poles would need support.

Q Do you know whether there are any instances where if there is need for additional cable support between the poles, that that support would be provided by something other than hangers suspended from a messenger wire?

A You need to be more specific. What are you referring to?

Q What you're referring to.

MR. SWEENEY: Objection. Form.

Q (BY MR. FLYNN) I'm referring to your testimony that a POSITA would understand and know that between poles, there would be a need to further support the conductors in the span between the poles, correct, that's what you testified to?

A That is correct, sir.

Q Is there ever an instance, that you're aware of, where that kind of support was provided by some mechanism other than a hanger suspended from a

messenger wire?

A If there is a messenger wire, a POSITA would use that to support the wires, as Petersen. There is a messenger wire. What is the need of having that messenger wire, sir? A POSITA would know that messenger wire is there to support the cables as well as if it's grounded and there are no other grounds as a ground path, part of the grounding system.

Q You believe -- it's your testimony that Petersen's neutral messenger cable 37 not only supports hangers that aren't shown in Petersen in the spans between the poles, but that it would also act as a grounding conductor that provides an effective ground fault current path; is that correct?

A Petersen discusses that's grounded, the component attached to it is grounded, the attachment system itself is grounded. A POSITA would conclude that if those parts of the system is grounded and I have a messenger wire that uses to -- is used to support those cables between the poles, then that messenger wire is supporting cables as well as acting as a ground wire or a part of a grounding system, like grounding conductor, as you would put it.

Q Is a messenger cable ever used for any

purpose other than supporting wires?

A I can't remember. Messenger cable, guidewire, those are usually used for supporting -- support. I don't know if they are -- and ground. I don't know -- I can't remember other purposes for them.

Q Do you know whether a neutral messenger cable is used as part of the circuit in any system?

A I have no idea what you're talking about, sir.

Q Do you know whether a cable that is a neutral messenger cable is intended to and structured to conduct current under normal operating conditions as part of the circuit?

A I don't know every situation, but that's not usual. It is designed to act as a support as well as a ground system, a messenger grounded wire.

Q Do you distinguish at all between a messenger cable and a neutral messenger cable?

A The messenger cable that acts as a neutral, which in the United States is grounded, is a neutral messenger wire.

Q Do you know whether a neutral messenger cable in the United States is intended to carry current?

A I don't know if there are specific circumstances.

Q You don't know?

A In a neutral wire of a single-phase system, you have a return. If it's not grounded, it will carry normal current. But in the United States, as I discussed, those are always grounded.

Q You'll recall we talked earlier today about the 2003 Southwire triplex cable service drop, correct?

A Yes, sir.

Q And you confirmed for me that the -- the neutral messenger of the Southwire service drop was bundled together with the phase conductors, correct?

A That is correct.

Q And as bundled together with the phase conductors, that neutral messenger becomes part of the circuit, correct?

A I don't know what you're talking about, "the circuit."

Q You said if the neutral messenger cable is grounded, then a POSITA would understand that it is acting as a grounding conductor, correct?

A In the absence of any other ground or ground system.

Q Does Petersen show anything -- strike that.

Peterson's figures show portions of a pole, correct?

A That is correct.

Q And specifically, portions of the pole where this bracket is attached to at the top, right?

A That -- you mean 14, Item 14? Yes, sir.

Q And Petersen doesn't show in those figures or discuss in the specification anything beyond this pole top extension for the aerial cable, does it?

A I am not sure what you're referring to, sir.

Q Well, look at Column 1 if you would, please. And the title under the number of the patent says, Pole Top Extension For Aerial Cable, correct?

A Uh-huh. Yes, sir.

Q And in the -- at Line 13 it says, In recent years there has been a tremendous increase in interest in aerial cable suspension systems, which obviate the use of cross arms and the like. Correct?

A I read this.

Q And then it says at Line 22 of Column 1, It is the general object of this invention to provide a pole top mounting for wire spaces of the

aforedescribed type, which is compact in size, has the requisite strength to support the heavy cables, has a minimum number of parts, and which is well adapted to mass manufacturing techniques.

You see that, right?

A Yes, sir.

Q And all the rest of the specification of Petersen as well as the claims of Petersen are all directed to this pole top extension bracket, which is the object of the Petersen invention, correct?

A I can't remember all of it, but it's directed as that pole top extension.

Q Petersen nowhere is disclosing or purports to disclose every element or component of the entire electrical system, including everything that's on the poles or everything that happens between pole to pole, is it?

A It does not appear to show every element.

Q So once again, your opinion is based on the absence of anything shown in Petersen that would be a separate grounding conductor to support your conclusion that Petersen's neutral messenger cable 37 is the grounding conductor that provides an effective ground fault current path; is that right?

A There is no reason to ground the messenger

wire and all the elements connected to it, as well as no other separate grounding wire in the system. A POSITA would conclude that's a grounding -- part of a grounding system as well as supporting wires.

Q And when you say "part of a grounding system," you mean acting as the grounding conductor that provides the effective ground fault current path, correct?

A That is correct, sir.

Q I know you pointed me to Paragraph 43 in your declaration. But in your analysis of Petersen that begins on -- with the -- on Page 102 and the first paragraph of your Petersen analysis at Paragraph 170 on Page 103 --

A Uh-huh.

Q -- from there throughout your analysis of Petersen, which extends through -- extends through Page 127, Paragraph 213, is there anything anywhere in those paragraphs that discusses additional support for a POSITA's understanding that there would need to be additional support for the aerial cables between poles, where that additional support, a POSITA would further understand, would be hangers suspended from a messenger wire?

Is there anything like that in any of

those paragraphs of your Round 3 analysis in your declaration?

A I do not know. But I did --

Q Take a look, please.

A No need.

Q Okay.

A I did not need to mention this. I have at length described that at the beginning of my declaration.

A POSITA familiar with industry as described would know those materials when looking at this. No need to repeat this. I don't know exactly. But if it's not or it is, there's no need since I've at length covered that.

Q In Paragraph 43 of your declaration, did you -- that wasn't specifically relating to Petersen, was it?

A It does not have to be related specifically to Petersen.

Q You don't make any reference to Petersen in Paragraph 43 of your declaration, correct?

A It does not have to be.

Q Okay. My question is, you don't make reference to Petersen in Paragraph 43 of your declaration, correct?

A I don't know in that section.

Q If you would look at Paragraph 43 and confirm, please.

A In 43 onwards, 43 and 44 and so on, I have provided sufficient reference to what general understanding is and would be. No POSITA would feel that there is a need to further, in each section, go and describe the same material again and again.

Q Is the answer to my question no, there's nothing in those paragraphs that references Petersen?

A I don't see that, sir.

Q Dr. Beik, you've indicated that you have not personally observed a solar plant installation in the field. Have you personally observed a transmission system, power transmission system in the field?

A What do you mean by "power transmission system"?

Q I thought that was the term that you had used before, that a POSITA would understand that in this kind of a power transmission system that there would be further supports between the poles in an installation like this in the field.

A Can you point to me where I used it?

Q No, I can't and I won't. Instead, what

I'll do is I'll ask you the question whether or not a POSITA would understand in the field, in the kind of a system that is shown by Petersen, that there would be necessarily further supports for the cables between poles, those supports being hangers suspended from a messenger wire.

A Petersen does not discuss generation, transmission or distribution. As described in my declaration, a POSITA would know that the current-carrying cables between two poles need to be supported.

Q Have you ever visited personally generation, transmission or distribution systems in the field?

A I have, all of them.

Q When? How often?

A I do not remember when or how many times.

Q Have you personally gone to generation, transmission or distribution systems in the field in the United States?

A I have.

Q Can you tell me approximately when?

A I don't recall.

Q Can you tell me whether it was before or after 2017?

A After -- in the United States, after 2017.
Q Can you tell me whether it was before or after, in the United States, 2021?
A I can't recall.
Q You came to the United States from Canada in October 2021; is that correct?
A That is not correct.
Q Okay. I'm looking at your CV that is attached to your declaration. And it indicates that from 2017 to September 2021 you were at various entities in Canada; is that correct?
A That is correct.
Q And was it thereafter that you came to the United States?
A It was after my employment in Canada. But I have been to United States before that.
Q Okay. So do you know whether or not you visited a generation system in the United States, in the field, after you came to the United States at the conclusion of your employment in Canada?
A I cannot say that's the only time, but it has happened after my employment there --
Q Okay.
A -- as well.
Q And the same thing with transmission and

distribution systems?

A That is correct, sir.

Q Dr. Beik, would you turn, please, to Paragraph 233 of your declaration -- actually starting at Paragraph 232, Section 16, Considerations of Non-Obviousness.

You state in Paragraph 233 that the '551 patent did not resolve any long-felt need, correct?

A That is correct.

Q And you state, Rather, the '551 patent presented known options for grounding electrical distribution systems using cable support system components. Correct?

A That is correct.

Q And that is, again, referring back to the prior art examples that you provided in your declaration that we spoke about earlier today, correct?

A Some of which I provided.

Q What do you mean, some of which you provided?

A There are prior art, there might be, that I have not provided. What I provided I believed was sufficient to demonstrate the discussion.

Q You said prior art references, there might

be. You don't know whether there are or not?

A I don't know.

Q And you say, For the same reasons -- I'm sorry. Strike that.

You're also not aware of any secondary considerations of non-obviousness in the form of commercial success with respect to the '551 patent; is that correct?

A Could you please tell me where it reads -- where it does read "commercial success"?

Q In Paragraph 232 it references --

A Oh, 232.

Q -- to commercial success as one of the secondary considerations of non-obviousness. Do you see that?

It says -- when you're talking about what the secondary considerations are, you said, These include commercial success of the claimed invention.

A That is correct.

Q Are you aware of any secondary evidence -- secondary considerations evidence of commercial success relating to the '551 patent?

A I can't remember if this was anything in the prosecution history.

Q Other than if there was something in the

prosecution history, have you made any other attempt to ascertain whether there was any commercial success relating to CAB's commercial embodiment of the '551 invention?

A I can't remember, sir.

Q Are you aware of any -- strike that.

When we were talking about the CAB website, Exhibit 1005, you were pointing me to stamps showing solar awards on various pages of that exhibit. Do you recall that?

A Yes, sir.

Q You specifically pointed to Page 3 of Exhibit 1005. It refers to Intersolar AWARD 2014 finalist. Do you see that?

A Yes, sir.

Q And that's there twice on Page 3. There's also the same stamp with that award on Page 4, right?

A Yes, sir.

Q And there's also on Page 8 and various other places in Exhibit 1005 and -- other awards, correct?

A That is correct.

Q Would you consider those kinds of awards, for any particular kind of system, would you consider that to be evidence of industry recognition or

praise?

A I would consider those as it relates to a particular element of being worthy of receiving an award.

Q Are you aware of any award specifically bestowed upon CAB that specifically relates not to what's shown in Exhibit 1005, but to their integrated grounding system that is the commercial embodiment of the '551 invention?

A I don't --

MR. SWEENEY: Objection. Form.

A I do not know.

Q (BY MR. FLYNN) Did you ever make any attempt to ascertain whether there had been any such awards or industry recognition bestowed upon CAB for its products embodied in the '551 invention?

A I don't remember.

Q If you did become aware of evidence of commercial success that was specifically relating to commercial embodiments of the '551 invention or evidence of awards or industry recognition or accolades that would be -- that would relate to the '551 invention, would that change your opinion at all as to whether such evidence of secondary considerations would dictate against a finding of

obviousness?

A The invention of '55- -- the claimed invention of '551 is nothing more than what has been invented, described and disclosed in the prior art.

Q So is the answer that no amount of secondary considerations would change your opinion as to whether the claims of the '551 patent are obvious?

A This is a solution that has been long before, decades before, provided in the -- in this field.

Q So is your answer that no amount of evidence of secondary considerations of non-obviousness would change your opinion as to whether the claims of the '551 patent are obvious?

A As I put forth extensive prior art, no.

MR. FLYNN: Can I just have two minutes to just look over final notes and I think we're probably finished, but let me just do a final check.

MR. SWEENEY: Yeah, go for it.

(Recess from 2:53 p.m. to 2:59 p.m.)

Q (BY MR. FLYNN) Dr. Beik, right now, I have no further questions for you subject to any questions that your counsel may ask you, but at the moment, I'm finished.

MR. SWEENEY: Great. I've just got a

couple -- a couple topics I want to hit.

EXAMINATION

BY MR. SWEENEY:

Q Okay. If you could pull back up Exhibit 1037, the prosecution history, and if you could go to Page 128 of the prosecution history. Excuse me, Page 127.

Do you see where the examiner is giving his claim rejections and the paragraph that begins with, Regarding Claim 1, Korman, et al. disclose a multifunction line assembly 60, 42, 43, including a multifunction Line 60?

A Yes, sir.

Q Great. If we turn to the Appellant's Brief on Appeal, go to Page 177.

A Yes, sir.

Q Do you recognize these to be figures from the Korman reference discussed by the examiner, Figures 9 and 10?

A These appear to be from the Korman reference.

Q Do you see element 60 in Figure 9?

A Yes, sir.

Q Do you agree, based on your understanding of the Korman reference, that this is a subcomponent

of the plug and play connector 42 and 43?

A Yes, sir.

Q Do you agree that this subcomponent 60 does not provide any support functionality for the plug system in Korman?

MR. FLYNN: Object to form.

A Would you like me to answer?

Q (BY MR. SWEENEY) Of course.

A Given Korman, it does not appear that pin 60 can provide the support.

Q In your opinion, is that why it doesn't meet the definition of multifunction line?

A That is correct.

Q Okay. Great.

If we could go back to Exhibit 1005, the CAB website. If you go to Page 5, please. In the second image at the very top of that image, do you see a cable extending downwardly from the PV panels towards the pile?

A Could you please point me to where you're talking about.

Q The second image?

A Second image.

Q Yep.

A Okay.

Q At the top.
A At the top?
Q It's very faint.
A Oh, yes, sir.
MR. FLYNN: Where are you pointing to?
MR. SWEENEY: Right here.
MR. FLYNN: Okay.
Q (BY MR. SWEENEY) What would you expect this cable to be?
A It's a cable hanging from the solar panels.
Q So you would expect it to be part of a functioning PV array?
A I would expect as a POSITA that is part of the PV array.
Q Okay. Could you please go to Page 13.
In the top image, do you see solar panels in this -- strike that.
In the top -- the top image of the CAB website on Page 13 depicts solar panels, correct?
A That is correct, sir.
Q Do you see underneath the solar panels a series of cables going from the solar panels to the ground?
A I see those, sir.

Q What would you expect those cables to be?
A Those are cables, feeders, from the solar panels.
Q Would you expect to see those types of cables in a functioning PV array?
A A POSITA would conclude that cables coming from those solar panels would be functioning cable feeders from the solar panels.
Q Great. Thank you.
Could you please pull up Exhibit 1006, the CAB white paper. Would you please go to Page 3.
A Yes, sir.
Q You'll agree that this image appears to depict the same installation depicted on the CAB website, correct?
A That is correct, sir.
Q In this image, do you see a black box with cables protruding from it toward piles on the top left of the image right above the text?
A That is correct, sir.
Q What would you understand this black box with cables protruding from it to be?
A Those are cables from the solar panels.
Q Would you expect to see these types of cables in a functioning solar array?

A Absolutely.

Q Would you please pull up Exhibit 1004, Petersen.

You discussed earlier Petersen's usage of component Number 37, the neutral messenger wire. Do you recall that?

A Yes, sir.

Q In your opinion, what is Peterson's usage of the term "messenger" imply to you?

A It provides support functionality as one of the functionalities.

Q So you'll agree that the neutral messenger wire must be supporting some -- must be serving some support function, correct?

MR. FLYNN: Object to form.

A Would you like me to answer?

Q (BY MR. SWEENEY) Of course.

A As I discussed in my answer to Mr. Flynn, that's one of the functionalities of a messenger wire, a neutral messenger wire.

MR. SWEENEY: Great. Thank you very much. No further questions.

EXAMINATION

BY MR. FLYNN:

Q Dr. Beik, just a few follow-up questions.

Mr. Sweeney referred you to Exhibit 1037 and Page 177 that shows Figures 9 and 10 included -- of Korman, included within appellant's brief and appeal, correct?

A Yes, sir.

Q And as I understand it, your testimony was that pin 60 shown in Figure 9 does not support any -- does not provide any support functionality; is that correct?

A Given that I have reviewed from Korman, there are other support structures that provide support for the solar panels, not pin 60.

Q And what you're referring to and what you have reviewed from Korman, is that part of the excerpted Exhibit 1037 that's in front of you now?

A It is at right page before that, Figure 6 and 7, combined with Figure 9 and 10, and then go back to Figure 11 -- sorry, Page 11, Figure 5. Essentially, Page 175, Figure 5; Page 176, Figure 12, Figure 6 and 7; Page 177, Figure 9 and 10; Page 178, Figure 3 and 4; Page 179, Figure 9 and 10.

Q When I was asking you questions about Korman, you told me that you really couldn't answer them unless you had Korman in front of you, but you're able to answer these questions based upon your

review of what's shown of Korman within appellant's appeal brief, correct?

A You never directed me -- and I requested repeatedly. You never directed me to any pictures or photos or the evidence, whereas --

Q So it is your opinion that it's because pin 60 does not provide support functionality that that's why Korman does not disclose the claimed multifunction line; is that correct?

A It does not appear to be providing support based on that; therefore, it's lacking one of the definitions of Patent '551 as the inventor defined it as.

Q Do you know whether or not the patent owner made any kind of argument against Korman that was based on the assertion that Korman's pin 60 did not provide support functionality?

A I can't remember what exactly it was, but there were some discussions in the prosecution history.

Q Do you know whether the notice of allowance that provided the reasons for allowance gave the reasoning that you're talking about, that pin 60 does not provide support functionality; and therefore, is not a multifunction line?

A I cannot recall exactly, but a POSITA would look at pin 60, Figure 9 and 10, the figures before that and after that, and would conclude that pin does not provide the support.

Q That wasn't the basis of the examiner's decision to allow the claims, was it?

A I don't remember. Can you point me to that, please?

Q If you would turn to Exhibit 1005 and go back to Page 5 Mr. Sweeney directed you to, because, frankly, I wasn't quite sure where the cable was that you had identified was coming from the solar panels.

Could you show that to me, please. Exhibit 1005. This is 1005 here, right?

A My finger is both pointing at the cable in 1005 and 1006.

Q Would you please take my pen, Dr. Beik, and circle on Exhibit 5 -- 1005 --

A 1005, 1006. Both of them, I've circled for you, sir.

Q Okay. And so what you have circled on 1005 and 1006, in your opinion, that would tell a POSITA that this is an actual solar plant installation?

A That -- those pictures are identical. One

in the website seems to be cropped. These pictures show a professional solar panel and wire management system.

Q The question I asked you is whether what you circled on Exhibit 1005 and 1006, whether in your opinion that would tell a POSITA that this is an actual solar plant installation.

A That's one element of many other elements within these two exhibits that shows a POSITA. A POSITA would come to a conclusion these are a professional installation in a solar power system.

Q And then, Dr. Beik, you keep using the term "professional installation." And I don't know if you're distinguishing between professional installation and actual installation or not. But I want to be very clear what my question is.

Are you telling me that the cable that you circled in Exhibit 1005 and 1006 would be sufficient to inform a POSITA that what is shown in 1005 and 1006 is an actual solar plant installation, an actual functioning solar plant installation?

A Those cable -- those that you asked me to circle, combined with everything else in those 1005 and 1006, would point a POSITA to a professional installation.

Q And I'm going to ask you the same question. You're using the term "professional installation." And I'm talking about an actual working, functioning installation. Is that what you mean by "professional installation"?

A A professional installation would be functional and would conform to the requirements of the standards.

Q Conform? Did you say conform to the requirements?

A Would be certified as a functional system.

Q So then you would -- it's your opinion that these features that you circled, these cables that you circled on Exhibit 1005 and 1006 would inform a POSITA that this was an actual functioning solar plant installation that conformed with code requirements?

A I believe this is number -- fourth time that I am repeating. That is one element of many other elements within 1005 and 1006 pointing a POSITA to conclude that's a professional installation, operational, conforming to standards and codes.

Q Why do you keep changing the term "actual installation" to "professional installation"?

A I like to use my own words. I know what

they mean, and they're sufficient in expressing my views as a POSITA.

Q And on Page 13 of Exhibit 1005, would you do the same thing. Would you circle for me, please, the cables that you were pointing to in response to your counsel's questions?

A There are two cables, two sets of cables that I circled for Mr. Flynn.

Q And the same thing, is it your opinion that these cables that you circled on Page 13 of Exhibit 1005 would inform a POSITA that what's depicted on the CAB website at that page is a functional solar plant installation that conforms with code requirements?

A I'm going to keep repeating this. That is another element of many other elements within these two exhibits, 1005 and 1006.

Q Okay. You mentioned in response to Mr. Sweeney's questions about feeder cables. Do you recall that?

A (Nodded head.)

Q When I asked you about --

A Yes.

Q -- feeder cables, you didn't know what they were.

A I asked you what you're referring to. And --

Q Did you ask Mr. Sweeney what he was referring to?

A Mr. Sweeney did not bring up the word "feeder." I did.

Q What do you mean by "feeder cables"?

A And I provided an example to you, sir. I said a feeder could mean AC/DC cables. It's a general word. And I state the same thing that I told you.

Q When you say they could -- did you say they could be AC or DC cables?

A A feeder cable, it's a generic word used in power systems. A feeder cable means it's a cable that goes from one point to another point. For instance, goes from a solar panel to a distribution box. It's an example of a feeder cable.

Q In the context of a solar installation, are you aware of any distinction between a feeder cable and a string cable?

A What do you mean by "string cable"?

Q Do you have any understanding of the term "string cable"?

A That's general -- another general word

that sometimes is used. I would like you to tell me what --

Q Well, just like with feeder cable, I'd like you to tell me what your understanding of the general word "string cable" is?

A A string cable is used in power system. Could be AC cable, could be DC cable. It depends on the application and how you distinguish it. Rather than using those two outdated words, I would refer to them as DC cable, AC cable, controls cable, signals cable, sensors cable and so on.

Q And you would also consider feeder cables to include all those types of cables as well; is that correct?

A A "feeder cable" is a generic word. You can use it as AC/DC depending on the application what you refer to. And that's not -- we use DC cable, AC cables, for instance, to distinguish them better.

Q I'm going to make sure I don't get the exhibits mixed up. These are the actual exhibits that you placed the circles on.

A That's mine, yes.

THE COURT REPORTER: Are you going to mark those?

MR. FLYNN: Well, they already are marked.

Well, because he put extra figures on them, or circles on them at my request. So, yes, I am going to mark them 2006 and 2007.

The one he's going to hand you right now, make that 2006. And that's 2007.

(Exhibit Numbers 2006 and 2007 were marked.)

MR. FLYNN: So there are three new exhibits today, right, 5, 6 and 7? Okay.

Now I have nothing further. Thank you, Dr. Beik.

THE DEPONENT: Thank you, Mr. Flynn.

MR. SWEENEY: Nothing further on my end.

THE COURT REPORTER: Mr. Flynn, same order, rough draft and 3-day expedite?

MR. FLYNN: Yes, please.

THE COURT REPORTER: And Mr. Sweeney?

MR. SWEENEY: Same thing, please.

WHEREUPON, the within proceedings were concluded at the approximate hour of 3:24 p.m. on July 11, 2024.

* * * * * *

I, OMID BEIK, do hereby certify that I have read the foregoing transcript and that the same and accompanying amendment sheets, if any, constitute a true and complete record of my testimony.

_____
Signature of Deponent

( ) No Amendments
( ) Amendments Attached

Acknowledged before me this

_____ day of _____, 2024.

Notary Public:_____

My commission expires_____

Seal:

BJD

STATE OF COLORADO)
) ss. REPORTER'S CERTIFICATE
COUNTY OF DENVER)

I, Barbara J. Davalos, do hereby certify that I am a Registered Merit Reporter and Certified Realtime Reporter within and for the State of Colorado; that previous to the commencement of the examination the deponent was duly sworn to testify to the truth.

I further certify that this deposition was taken in shorthand by me at the time and place herein set forth, that it was thereafter reduced to typewritten form, and that the foregoing constitutes a true and correct transcript.

I further certify that I am not related to, employed by, nor of counsel for any of the parties or attorneys herein, nor otherwise interested in the result of the within action.

In witness whereof, I have affixed my signature this 16th day of July, 2024.



Barbara J. Davalos, RMR, CRR

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