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Transcript of William Brooks, PE

Date: October 10, 2024

Case: Affordable Wire Management, LLC -v- CCABH, Inc. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Affordable Wire Management, Exhibit No. EX1046

Case No.: IPR2024-00139

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Transcript of William Brooks, PE
Conducted on October 10, 2024

1 (1 to 4)

1	3
1 UNITED STATES PATENT AND TRADEMARK OFFICE	1 A P P E A R A N C E S:
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD	2
3 -----X	3 ON BEHALF OF PETITIONER:
4 AFFORDABLE WIRE MANAGEMENT, LLC,	4 MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND
5 Petitioner,	5 POPEO, PC
6 -against-	6 1 FINANCIAL CENTER
7 CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND	7 BOSTON, MA 02111
8 HANDICAPPED, INC.,	8 EMAIL: RCSWEENEY@MINTZ.COM
9 Patent Owner.	9 BY: ROBERT C. SWEENEY, ESQ.
10 -----X	10 ON BEHALF OF PATENT OWNER:
11 Case IPR2024-00139	11 ECKERT SEAMANS CHERIN & MELLOTT, LLC
12 U.S. Patent No. 10,177,551	12 TWO INTERNATIONAL PLACE, 16TH FLOOR
13 and	13 BOSTON, MA 02110
14 Case IPR2024-00178	14 EMAIL: TSCHMIDT@ECKERTSEAMANS.COM
15 U.S Patent No. 11,349,291	15 BY: TREVIN C. SCHMIDT, ESQ.
16 DEPOSITION OF	16
17 WILLIAM BROOKS, PE	17
18 REMOTE LOCATION	18 ALSO PRESENT:
19 October 10, 2024	19 ZOOM TECH, PAUL KAMINSKI
20	20 MINTZ, KEVIN AMENDT
21 REPORTED BY: KIARA MILLER	21
22 FILE NO.: 554262	22
2	4
1 UNITED STATES PATENT AND TRADEMARK OFFICE	1 MR. KAMINSKI: Thank you to everyone
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD	2 for attending this proceeding
3 -----X	3 remotely, which we anticipate will run
4 AFFORDABLE WIRE MANAGEMENT, LLC,	4 smoothly. Please remember to speak
5 Petitioner,	5 slowly and do your best not to talk
6 -against-	6 over one another. Please be aware
7 CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND	7 that we are recording this proceeding
8 HANDICAPPED, INC.	8 for backup purposes.
9 Patent Owner.	9 Any off-the-record discussions should
10 -----X	10 be had away from the computer. Please
11 Case IPR2024-00139	11 remember to mute your mic for those
12 U.S. Patent No. 10,177,551	12 conversations.
13 and	13 Please have your video enabled to help
14 Case IPR2024-00178	14 the reporter identify who is speaking.
15 U.S Patent No. 11,349,291	15 If you are unable to connect with
16	16 video and are connecting via phone,
17 Deposition of WILLIAM BROOKS, PE taken on behalf	17 please identify yourself each time
18 of PETITIONER, at REMOTE LOCATION, commencing	18 before speaking.
19 at 9:39 a.m., October 10, 2024, before Kiara	19 We will provide a complementary
20 Miller.	20 unedited recording of this deposition
21	21 with the purchase of a transcript. I
22	22 apologize in advance for any

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5 1 technical-related interruptions. 2 Thank you. 3 WILLIAM BROOKS, after having first been 4 duly sworn by a Notary Public of the State of New 5 York, was examined and testified as follows: 6 COURT REPORTER: Please state your 7 name and address for the record. 8 THE WITNESS: William Frederick 9 Brooks. My address is 3949 Joslin 10 Lane, Vacaville, California 95688. 11 EXAMINATION BY 12 MR. SWEENEY: 13 Q Good morning, Mr. Brooks. Thanks for 14 joining us today. My name is Robert Sweeney. 15 I'm counsel for Affordable Wire Management 16 LLC, in IPR2024-00139, regarding US Patent 17 No. 10,177,551; and IPR2024-00178 regarding 18 US Patent No. 11,349,291. 19 You're here today for your deposition 20 relating to the declaration you submitted in 21 both IPR matters on behalf of patent owner, 22 Cambria County Association for the Blind and	7 1 My only request there is that if I'm in the 2 middle of a question or a series of 3 questions, that you finish answering that 4 question or series of questions before we 5 take a break. 6 Does that sound good? 7 A Yes. 8 Q You understand you just took an oath to 9 tell the truth, correct? 10 A Yes. 11 Q And you understand that that's the same 12 oath that you would take to take if you were 13 to testify in court before a judge and jury? 14 A Yes. 15 Q Since we're taking this deposition 16 remotely, can you please describe your 17 surroundings for me. 18 A A windowless white room. 19 Q And who is in the room with you today? 20 A Two counsel. 21 Q Is there anyone outside the door that 22 you can see or communicate with?
6 1 Handicapped. 2 I'm going to be asking you a series of 3 questioned today regarding your declaration, 4 Exhibit 2033, in the 00178IPR, as well as the 5 00139IPR. 6 Does that make sense? 7 A Yes. 8 Q Great. I understand that you have a 9 printed copy of Exhibit 2033 in front of you; 10 is that correct? 11 A (No audible answer.) 12 Q Great. Is that version of Exhibit 2033 13 annotated or marked up in any way? 14 A Not in any way. 15 Q Great. Thank you. 16 Please let me know if at any time today 17 you don't understand or cannot hear my 18 question. Otherwise, I will assume that you 19 heard and understood my question; is that 20 fair? 21 A Yes. 22 Q Let me know if you need to take a break.	8 1 A No. 2 Q And how many screens are in front of 3 you? 4 A Two. 5 Q And what are on those screens? 6 A You're on one and I'm on the other. 7 Q Do you have any chat screens or other 8 forms of communication available to you right 9 now? 10 A No. 11 Q And where are you located 12 geographically? 13 A In the heart of Pittsburgh, Pennsylvania. 14 Q So you understand that I'll be asking 15 you questions today and you'll be answering 16 those questions truthfully and completely, 17 correct? 18 A Correct. 19 Q And if your counsel objects to one of my 20 questions you still have to answer that 21 question, unless he specifically directs you 22 not to answer.

1 Do you understand that? 2 A Yes. 3 Q Have you ever been deposed before? 4 A Yes. 5 Q How many times have you been deposed? 6 A At least eight times. 7 Q Were those all in relation to the same 8 matter or different matters? 9 A All different matters. 10 Q What were those matters regarding? 11 A Solar issues. 12 Q Were they patent cases? 13 A One. 14 Q What were the other matters? 15 A Contract disputes, various lawsuits. 16 Q Are you taking any medication or other 17 substances that might make it difficult for 18 you to understand or answer my questions 19 today? 20 A No. 21 Q Is there any reason why you cannot give 22 full, complete, accurate testimony today?	11 1 clients. And my experience in the industry 2 is over 36 years of experience. And I work 3 in all different areas and different sectors 4 of the solar industry including residential, 5 commercial, industrial, and utility scale. 6 This matter is focused on utility scale. 7 I've also done a tremendous amount of 8 training in the industry. Written articles. 9 I provide consulting services to product 10 manufactures on code compliance of their 11 products as it relates to the National 12 Electrical Code. 13 I am considered an expert in the 14 National Electrical Code. I'm on Code Making 15 Panel 4 of the National Electrical Code, 16 which covers the articles and installation 17 practices related to this field. 18 On Sunday evening, I fly to Long Beach, 19 California, where we will be doing -- putting 20 the finishing touches on the 2026 National 21 Electrical Code. 22 That's a short synopsis.
10 1 A No. 2 Q Great. 3 You are the principal engineer of Brooks 4 Engineering; is that correct? 5 A I am. 6 Q What is Brooks Engineering? 7 A It is a small, at this point, one-person 8 consulting firm that started in 2005 and 9 provides consulting services to the solar 10 industry in engineering. 11 Q What services does Brooks Engineering 12 offer? 13 A -- my deposition talks about it, if 14 you'd like to turn to it. 15 Declaration. I'm sorry. I said 16 deposition. That was in inaccurate. 17 So my declaration on Page 2, Paragraph 1 18 and 2 goes into explanation about those 19 activities. It says, It provides a wide 20 variety of services -- or services to a wide 21 variety of clients. I have, in my nearly 22 20 years with the company, I have over 300	12 1 Q Does Brooks Engineering offer white 2 papers on behalf of clients? 3 A I have provided many white papers to 4 various companies. 5 Q Approximately, what percentage of Brooks 6 Engineering overall work is authoring white 7 papers. 8 A 5 percent, maybe. 9 Q Approximately, how many different white 10 papers have you authored? 11 A It's hard the say. I would say on the 12 order of 20. 13 Q Generally, what are the white papers 14 about? 15 MR. SCHMIDT: Object to the form. 16 You can answer. 17 A All right. The vast majority of the 18 white papers have been related to the code 19 compliance of various products. 20 Q When you say "code compliance," which 21 codes are you referring to? 22 A All the relevant codes that would relate

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13 1 to that product. So the National Electrical 2 Code is certainly among the most prominent, 3 but many products also are governed by the 4 International Residential Code, the 5 International Building Code, the 6 International Fire Code. And NFPA 1, which 7 is the NFPA fire code. 8 Some of that is outlined in my 9 declaration showing -- and also, there are 10 codes -- so we often use in the same phrase, 11 the term codes and standards. I just rattled 12 off quite a few codes, but the standards 13 would typically be UL standards that are 14 safety standards. 15 I'm on most, if not all, of the 16 standards committees that govern the safety 17 products in this field. 18 Q So white papers that you authored 19 relating to code compliance of various 20 products, are those products that customers 21 have already commercialized or are planning 22 to commercialize?	15 1 As an expert, I do have the ability to 2 choose my clients, to some extent. But, 3 again, I can't recall specifically having a 4 request for a white paper and turning that 5 down specifically. 6 Q Who are Brooks Engineering's clients? 7 A As I mentioned earlier, I have had over 8 300 clients in my nearly 20 years of 9 personally being in the business, and then 10 16 years prior to that, in a very similar 11 role as a consultant. Working for consulting 12 firms in the North Carolina Solar Center. 13 So my clients are literally every 14 stakeholder that could be in this industry; 15 including product manufacturers, project 16 developers, you know, homeowners, business 17 owners, government. 18 So I don't believe you could mention any 19 sector or stakeholder that I have not 20 represented in my career. 21 Q Does Brooks Engineering have standard 22 rates for its services?
14 1 A It could be either. 2 Q Do you ever turn down a client's request 3 for a white paper? 4 MR. SCHMIDT: Object to form. 5 A I don't recall. 6 Q So every time a client has requested 7 that you offer a white paper for them, you 8 have authored a white paper for them; is that 9 correct? 10 A I don't agree with that statement. 11 Q Why don't you disagree with that 12 statement? 13 A Why don't I disagree? 14 Q Excuse me. I'll restate. 15 Why do you disagree with that statement? 16 A Oh, I would disagree with the statement 17 because I may choose not to work with a 18 client for various reasons. And in our 19 discussions, it might have been that they 20 wanted me to author a white paper, and for 21 whatever reason, I could have chosen not to 22 work with a client.	16 1 MR. SCHMIDT: Object to form. 2 A I have rates for my clients. 3 Q Is there a standard rate for authoring a 4 white paper for a client? 5 MR. SCHMIDT: Object to form. 6 A I would say no, there's not. I don't 7 have a rate sheet that says "white paper 8 equals this much." 9 Q Do you provide a quote to a client prior 10 to authoring a white paper for how much you 11 expect it to cost? 12 A Yes. 13 Q How much do you typically charge for 14 authoring a white paper? 15 A It would depend on the magnitude of the 16 project. So without going into a lot of 17 detail, I've done short white papers that 18 might have taken 10 to 15 hours of my time 19 versus white papers that could have taken 20 40 hours of time. 21 Q How much would a white paper that you 22 have authored that took you 10 to 15 hours

17 1 cost? 2 A It would depend on what time in history 3 you were talking about. There's a thing 4 called inflation, and my rates have changed 5 over the years and so that's why I say it's 6 usually based on hours rather than a number. 7 But the way I typically work with clients is 8 on a task basis. And so a white paper could 9 be among a variety of tasks that I would 10 provide for the client. And – which would 11 have a deliverable, which would often be a 12 draft of the white paper that would be 13 discussed. And then a finalization of that 14 white paper. And an estimate of a cost. 15 Sometime it's not to exceed number, 16 often it is, and usually, I've been pretty 17 accurate in gauging how much effort these 18 take, since I've done so many of them. 19 Q In the 2010 to 2015 time frame, how much 20 would it cost for you to author a white paper 21 that took 10 to 15 hours of your time? 22 A Between \$3- to \$5,000, something like	19 1 A It would be synonymous with large-scale 2 solar. And as the name implies, would relate 3 to larger systems that typically are 4 connected through a substation into the 5 utility distribution and transmission 6 network. 7 And there actually is a kind of a – an 8 elongated definition of large-scale plants 9 that's in Article 691, which I was the chair 10 of the committee that developed that article 11 in the National Electrical Code for 12 large-scale global take electric supply 13 stations. 14 And it actually calls out five megawatts 15 or larger connected directly into the 16 distribution or transmission system to 17 utility. And it doesn't supply any loads 18 like buildings or houses or anything like 19 that, prior to going into the utility system, 20 so it's a dedicated system. 21 Whereas a commercial industrial system 22 often would be installed in such a way that
18 1 that. 2 Q Does Brooks Engineering have 3 competitors? 4 MR. SCHMIDT: Object to form. 5 A What do you mean by "competitor"? 6 Q By "competitor," I mean another services 7 firm that a potential client of Brooks 8 Engineering could choose in lieu of Brooks 9 Engineering? 10 A That would be hard for me to directly 11 answer myself. You'd have to ask somebody 12 else in the industry. I believe I'm a 13 unicorn. So people come to me with typically 14 a specific request because I'm considered the 15 person that you go to provide objective 16 third-party information. Particularly in the 17 area of code compliance. 18 Q Are you familiar with the term "utility 19 scale solar"? 20 A I am. 21 Q What does the term "utility scale solar" 22 refer to?	20 1 it would connect its power into the service 2 for that commercial entity; and therefore, 3 use some of the power on site for loads. So 4 utility scale doesn't do that. It just 5 essentially produces the power directly into 6 the utility system. 7 Q All right? 8 MR. SWEENEY: Let's go off the record 9 for a second. 10 (Whereupon, a recess was taken 11 from 10:00 a.m. until 10:00 12 a.m.) 13 MR. SWEENEY: We can go back on the 14 record. 15 Q Have you ever been involved in designing 16 a utility scale power plant? 17 A Yes. 18 Q How many utility scale power plants have 19 you designed? 20 A I don't recall an exact number. 21 Probably about a dozen, that I was personally 22 engineer of record on.

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21 1 Q Were those all solar power 2 installations? 3 A Yes. 4 Q What years were you involved in -- 5 withdrawn. 6 What years were you the engineer of 7 record on a utility scale solar power plant? 8 A I would have to say in the time frame 9 of 2005 through 2015, would have been the 10 predominant years that I was engineer of 11 record. 12 Maybe as late as 2017, but that seems a 13 little bit late to me. 14 Q What does it mean to be the engineer of 15 record? 16 A Yeah, so the engineer of record, there 17 may be multiple engineers of record in a 18 utility scale plant, because there are 19 several disciplines involved. And so my 20 activity would be, typically, constrained to 21 the electrical engineering portion of the 22 plant design, which is in many ways the crux	23 1 combined, the wire sizing, the ampacity of 2 conductors. And that is talked about in the 3 declaration. 4 And having trained a good portion of the 5 engineers that are in this field, we get into 6 the details of all aspects of not only the 7 direct current side of a system, because 8 solar power is direct current, but also the 9 power conditioning side where we take the DC 10 power and convert it into AC power. And 11 typically, that AC power is stepped up to -- 12 in a utility scale application, into what we 13 call medium voltage in the power plant. And 14 then as it delivers the power to the utility, 15 it may stay at medium voltage, or it could be 16 using transformers transformed up to what's 17 considered high voltage for the transmission 18 system. 19 Q When did you first become knowledgeable 20 about the NEC? 21 A 1988. 22 Q And what was the impetus for becoming
22 1 of the project. But it would not include the 2 structural elements or the grading plans and 3 things like that. But it would include, and 4 could include, all aspects of the electrical 5 installation. 6 Q What are your typical duties when tasked 7 with designing a utility scale solar power 8 plant? 9 A Well, I guess my career has been 10 answering that question. And as a solar 11 engineering specialist and maybe one of the 12 first in world, among a small group of 13 people, we were developing, and I was 14 included in that, a lot of the engineering 15 standards and requirements for what a typical 16 design would include. 17 And so without going into a lot of 18 technical detail, that I don't believe would 19 be pertinent, it would be designing the 20 electrical configuration of the solar power 21 array of the number of modules that are in 22 series and in parallel, and how they're	24 1 knowledgeable about the NEC at that time? 2 A When I started my career in 3 solar/photovoltaic. 4 Q Is the entire NEC related to solar 5 power? 6 A That would be a no. 7 Q Are you familiar with the parts of the 8 NEC that are not directly related to solar 9 power? 10 A I am. 11 Q Can we go to Paragraph 29 of your 12 declaration. 13 There it says that in the 2005 to 2006 14 time frame the typical power installation -- 15 solar power installation was right around one 16 mega watt; is that right? 17 A Yes. It says on I believe it's the 18 third sentence. 19 Q And then in 2008 to 2009, multi mega 20 watt projects started popping up; is that 21 right? 22 MR. SCHMIDT: Object to form.

25 1 A This paragraph is describing a bit about 2 how the utility scale market began to 3 progress. 4 Q What changed between 2005 and 2009, that 5 facilitated this growth in wattage potential? 6 A A large Asian country got involved and 7 invested about \$30 billion in building 8 refinement of silicone on module 9 manufacturing and dropped the price in that 10 time frame from probably about 2005 to 2009, 11 a factor of about eight. Five to eight 12 times, and therefore many projects that were 13 maybe smaller – well, it essentially opened 14 up the market for larger projects that would 15 have not been financially viable prior to 16 that. 17 Q I see. So it fair to say that cheaper 18 PV panels facilitated this boom in wattage 19 ratings; is that fair? 20 MR. SCHMIDT: Object to form. 21 A It's not that it was reducing the cost 22 of solar panels and up to that point the vast	27 1 time frame that's talked about in the 2 declaration that's when we saw essentially 3 the utility scale market begin. And it calls 4 out Nellis Air Force Base, which was 14 5 megawatts at the time, which was at that 6 moment the largest system, certainly in the 7 United States, and possibly in the world at 8 that time. 9 Q So the introduction of cheaper PV panels 10 was not attributable to the increase in 11 wattage power ratings between 2005 and 2009? 12 MR. SCHMIDT: Object to form. 13 A I don't see how the wattage of the 14 panels is relevant, it had to do with cost 15 and maybe to some extent efficiency. And 16 that might be what you're referring to. 17 Q What costs reduced between 2005 and 2009 18 in solar? 19 A Well, the solar panels, which the 20 average person calls them they're called PD 21 modules. Solar panels on a per watt basis in 22 the 2004, 2005 time frame cost somewhere
26 1 majority of systems, certainly the larger 2 systems, when we say a one mega watt, I 3 really would not consider that utility scale 4 quite yet, and most of those projects, in 5 fact, there's several in my town in that one 6 mega watt range, were actually delivered to 7 pharmaceutical companies and large commercial 8 entities. 9 And so even though a lot of people 10 called them utility scale just because they 11 were very large, they're not considered 12 utility scale today. As I said, the 13 definition is five megawatts or greater and 14 delivered directly into the utility system. 15 And so we really didn't see much in the way 16 of utility scale. The Department of Energy 17 had done some projects, as this states in the 18 beginning of Paragraph 29, in the 1980's, 19 those were utility scale. One was one 20 megawatt. One was five megawatts way back in 21 the 1980's, those delivered directly into the 22 utility system. But we can say 2008, 2009	28 1 around \$2.50 a watt in those dollars at that 2 time. And by 2009, there was down to 75, 3 80-cents a watt, something like that. 4 That's certainly a factor of three or 5 four by then and it kept on going down. 6 Q Do you know what caused that drop in per 7 watt basis that you just referred to? 8 A A large country in Asia investing large 9 amounts of money, pretty much. They went to 10 scale in manufacturing and there were large 11 economies of scale, and they also had 12 inexpensive labor. Low cost of energy, very 13 little environmental regulation on their 14 manufacturing and all those things were able 15 to produce product at a fraction of what it 16 had cost before. 17 Q Then you mention in the same paragraph 18 of your declaration that in 2010 to 2011 time 19 frame the industry started to see solar power 20 installations with wattage power ratings of 21 over 100 megawatts. 22 Do you see that?

29 1 A I do. 2 Q What advancements in the 2010 to 2011 3 time frame facilitated that increase in 4 wattage power ratings? 5 A It's all related to our previous 6 discussion about cost. Costs continued to 7 come down. Also, when we get to the scale 8 of, let's say, One hundred megawatts, which 9 is kind of an order of magnitude larger than 10 the Nellis project, these projects take years 11 to develop and construct, and so that's part 12 of it. There are other aspects on the code 13 side of things, we were working on boosting 14 the voltage of photovoltaic systems, which 15 had been limited to 600 volts DC on the DC 16 side to 1,000 volts in that time frame. So 17 we started seeing 1,000-volt inverters in the 18 early 2011, 2012 time frame that helped a 19 little bit on cost as well. On what we call 20 the balances system side. So many things 21 were essentially evolving, but in large power 22 plants do not happen quickly.	31 1 tracking systems, trackers have been a part 2 of the solar industry for many decades and 3 the single access called polar access 4 trackers with north/south access that track 5 the sun from the east to the west are by far 6 the most common. And they were common – 7 they have been – for larger systems have 8 been the most common method of installation 9 since 2006, going back that far, but it 10 certainly – they are the dominant type of 11 physical installation and have been for the 12 last nearly 20 years. 13 For large scale. 14 Q Were trackers common in larger systems 15 prior to 2006? 16 A Larger systems were not common prior to 17 2006. So they were – they had been 18 established. I've worked with trackers. 19 They were built in the late 1980s. So 20 tracking systems have been around for many 21 decades. There just haven't been, in fact, 22 the system that I mentioned at the beginning
30 1 Q And this 2010, to 2011 time frame, were 2 PV panel, excuse me, were PV modules becoming 3 more efficient? 4 MR. SCHMIDT: Object to form. 5 A Throughout that whole time frame and I 6 would say throughout history, there's been a 7 general and gradual improvement of efficiency 8 over time and cost. As stated earlier, 9 the 2008, 2009 time frame saw a step change 10 in cost. Not necessarily in efficiency, but 11 gradually over that time we've also seen 12 improvements in efficiency as well as cost 13 for that time to today. 14 Q So between 2009 and 2011, were you 15 seeing larger solar installations being 16 installed, meaning more panels in a solar 17 power plant? 18 MR. SCHMIDT: Object to form. 19 A Larger systems would mean more panels. 20 Q Did the introduction of solar trackers 21 enable this rise in power ratings? 22 A Without going into the history of	32 1 of this paragraph, that we're spending a good 2 amount of time on, is the five megawatt 3 system was a two-access tracking system that 4 the Department of Energy installed in 5 southern California. So that was installed 6 in the mid-1980s. So there's a long, long 7 history of that. And certainly as the system 8 size grew, tracking systems were a common 9 method because they extend the energy 10 production of a PV system anywhere from 20 to 11 30 percent and also provide power production 12 late in the afternoon when typically utility 13 companies need it most. 14 Q Do systems with trackers have an 15 increased cable management demand? 16 MR. SCHMIDT: Object to form. 17 A Cable management is an issue on every 18 single solar/photovoltaic system. Since 19 these large systems can include millions of 20 solar panels you are absolutely increasing 21 the amount of cable management dramatically. 22 Q Would the cable demands for a system

33 1 with a tracker be higher than a system 2 without a tracker? 3 MR. SCHMIDT: Object to form. 4 A Not necessarily. 5 Q Why is that? 6 A The number of modules would dictate how 7 much cable is involved and a fixed tilt 8 system could have more modules than a 9 tracking system, if possible. Tracker versus 10 not tracker is not the issue, it's more about 11 how big the array is. 12 Q Did the boost in voltage for DC to 600 13 volts to 1,000 volts result in an increase of 14 the amount of DC cables for a given inverter? 15 MR. SCHMIDT: Object to form. 16 A No. Actually it works the other way 17 around. So as you boost the voltage up the 18 amount of wiring goes down. So the DC 19 voltage of a system, the reason that system 20 designers would like to go to higher and 21 higher voltages is because it reduces the 22 amount of wiring involved. That's its key	35 1 year and up to three years. There are – 2 just to add to that, there are pieces of 3 equipment in the project that might have 4 18 month lead times. 5 Q What pieces of equipment have the 6 longest lead times? 7 A Substation transformers would be an 8 example of something that has an exceedingly 9 long lead time. So much so that a large 10 plant that has one or two substation 11 transformers may actually buy another 12 transformer that cost \$5 million and have it 13 sitting on site because if the transformer 14 were to fail it would cost the project 15 \$50 million waiting for the new transformer. 16 Q What are the steps for starting a 17 utility scale power plant? 18 MR. SCHMIDT: Object to form. 19 A Yeah, I guess I'm struggling with the 20 line of reasoning. Help me out here. 21 I'm trying to understand where you're 22 going or what we're trying to accomplish. A
34 1 benefit. 2 Q How long does it take from the point of 3 designing a solar power installation until 4 that installation becomes operational? 5 A Two weeks to three years. 6 Q How common is it for a large system to 7 be operational --withdrawn. 8 How long does it take a large system 9 from design to becoming -- withdrawn. 10 How frequently does it take two weeks 11 for a solar installation to go from the 12 design stage to becoming operational? 13 MR. SCHMIDT: Object to form. 14 A Since you didn't specify a size range, I 15 would say the vast majority of PD systems in 16 the United States in the millions are in that 17 range because they're residential. 18 Q How long does it take for large scale 19 system to become operational from a design 20 stage? 21 A If we're talking in the 100 to – 100 to 22 500 megawatt range, typically no less than a	36 1 project has many, many, many things, so if 2 you're saying the start of a project, 3 typically there's land acquisitions, there's 4 environmental studies, there's all kinds of 5 things that before you ever put, essentially 6 pen to paper or begin the design process of 7 the physical array that some of those things 8 can take a year or two all by themselves 9 before you even start designing the system. 10 And so that's why I say these lead time and 11 the design process can take a tremendous 12 amount of time particularly in desert areas 13 where there are endangered species, erosion 14 worries, there's just all kinds of thing that 15 go into that process that seem benign or 16 irrelevant to the building of an electric 17 power station, but are major issues. 18 Q At what stage in this process are 19 balance of system components purchased? 20 A Fairly late in the process. After the 21 physical design were to take place. So once 22 the land is purchased and all the issues have

37 1 been worked out for erosion control and 2 grading and all the rest, then it's 3 determined where the solar panels can go 4 because you can't just say, well, you've got 5 so many acres and you're going to be able to 6 fit so many panels. It has to go according 7 to how the environmental and erosion control 8 issues are. And then once that's developed 9 then typically plants, as the plant I was at 10 on Tuesday, they're laid out in blocks and 11 those blocks – then there's a certain 12 numbers of blocks. And those certain number 13 of blocks will typically have recurring 14 wiring and balances systems. That 15 essentially once you determine how one block 16 goes the rest of blocks will be similar. 17 And at that point, a lot of these 18 projects are turned over to EPCs, engineering 19 procurement and construction firms and those 20 EPCs will then do take offs on the drawings 21 and do the final drawings. Do take offs on 22 the drawing, and then begin the process of	39 1 MR. SCHMIDT: Object to form. 2 A I would say it depends. It really does. 3 It depends on the component. It depends on 4 the overall availability, things like that. 5 So it's very difficult to say. 6 Q In Paragraph 33, of your declaration, 7 you excerpt a chart from NREL, showing US net 8 new PD capacity, correct? 9 A Yes. 10 Q Would you please explain what this chart 11 is depicting? 12 A We're talking about the chart at the top 13 of Page 14? 14 Q Correct. 15 A So this is a chart which is a stacked 16 bar that shows from 2015, I believe, yeah, it 17 looks like 2015 through it looks like 2023, 18 and the stacked bar includes residential, 19 commercial/industrial, which is C and I and 20 utility scale. So it shows how much new 21 capacity was brought on and determined net 22 new means that there's going to be some
38 1 procuring as much of the equipment as they 2 can given the fact that there are supply 3 chain issues and lead times that they even at 4 the beginning of the project may not even be 5 aware of. 6 Q What do you mean by take offs? 7 A Take offs are just basically – there's 8 a software that does it, but also can be done 9 manually where the various pieces of 10 equipment are categorized and totaled up and 11 billing materials developed so that a 12 purchasing agent can then go through and 13 procure that equipment. That's the "P" of 14 the EPC. 15 And that's also when the surprises come 16 back that so and so can't deliver for 17 18 months and that's just not going to work 18 for us and so they've got find another 19 supplier or whatever. 20 Q How common is it that the procurement 21 stage requires sourcing a particular 22 component from multiple suppliers?	40 1 capacity taken offline at the same time so 2 that will subtract a little bit in the 3 process, but mostly new capacity in this 4 case. 5 Q What do you mean by some capacity 6 taking, some capacity offline? 7 A Yeah, I think they use the term net new 8 just because some of this equipment they 9 can't tell whether or not it or might be 10 replacing equipment, not much though, and so 11 they're trying to give it an idea to the 12 Federal government and to users of this 13 information to say that the amount of solar 14 is increasing. And it would not be truthful 15 if you just considered new capacity going in 16 and not subtract from it, the old capacity 17 coming off may be from older plants. 18 Q I see. So net new includes replacing 19 components or plants and taking that away 20 from this amount? 21 MR. SCHMIDT: Object to form. 22 A I'm not sure exactly from the way you

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41 1 said that. But it's true of lot of the way 2 energy statistics are done for the nuclear, 3 coal, and natural gas. For instance, 4 nuclear, since plants have come offline, if 5 you look at the amount of nuclear that we 6 have or whatever, if new nuclear came online 7 it may not be an increase in nuclear, it 8 might be actually a decrease, but you have 9 new nuclear versus nuclear coming offline. 10 So in this case, the vast majority of 11 this is new coming online, but some of it 12 could be replacement of older arrays. 13 Q Does net new PV capacity refer to what 14 the plant is expected to generate or actually 15 is generating? 16 A So the capacities that are shown in this 17 graph are in gigawatts AC. So this would be 18 the plant capacity in each of these 19 categories. Probably the easiest of which 20 would be -- to measure would be the utility 21 scale portion of it. 22 Q I see. So the capacity is the estimate	43 1 connected thereto; is that fair? 2 A That's fair. 3 Q You mentioned a rhetorical situation 4 where the plant is capable of producing 320 5 megawatts, but it's limited to the 280 6 megawatts. 7 Is that a common disparity, that range? 8 MR. SCHMIDT: Object to form. 9 A I would say that most plants build out a 10 larger capacity than their interconnection 11 agreement for the purpose of reliably being 12 able to provide the contracted power amounts. 13 And so sometimes there are penalties if you 14 don't produce a certain amount during certain 15 times of the year, certain times of the day; 16 and therefore, they overshoot. 17 And also the fact that solar energy is 18 not at its peak generating capacity 19 throughout the entire day, so it allows them 20 to produce closer to their limit for a longer 21 period of time. 22 And so this is all done through
42 1 based on -- withdrawn. 2 Is the capacity an estimate, or what the 3 plant is generating? 4 A So a plant's capacity is typically based 5 on its interconnection agreement. And so 6 a -- an interconnection with the transmission 7 system might be rated at 280 megawatts. The 8 plant itself might have the capability of 9 producing 320 megawatts, but the substation 10 limits the output of the power of the plant 11 to that 280 megawatt number. And therefore, 12 typically the capacity of a plant would be 13 considered 280 megawatts. 14 Q Why do substations limit the output of a 15 solar power? 16 A All kinds of reasons. Usually it's 17 based upon the available capacity of the 18 transmission lines. 19 Q I see. So some of these new solar 20 installations could actually generate more 21 power, but they're limited because of the 22 substation and the transmission lines	44 1 economics. And so you don't ever overdesign 2 a plant just for fun. It's always about the 3 numbers. 4 Q In Paragraph 35 of your declaration on 5 Page 15, you mention that COVID contributed 6 to the growth of solar capacity in 2020, 7 correct? 8 A I'm going to look at what it says here. 9 The further -- so "In addition, there was 10 significant concern in 2017 about tariffs." 11 It's about halfway down the page: 12 "This further subdued growth in 13 2018 and 2019. Growth resumed in 2020. 14 COVID actually contributed to the 15 growth of the solar capacity in 2020 16 and 2021, as during this time solar 17 installations were among the only 18 construction projects being installed." 19 And that's why we saw -- there was some 20 pent up demand from the previous years, and 21 projects that had been maybe put on hold 22 being released. And so there was a variety

45 1 of things that came together during the COVID 2 era that saw an increase. 3 Q How did COVID contribute to the growth 4 of solar capacity in 2020? 5 A There was a lot of labor out of work. 6 And so the labor market, I believe, building 7 power plants was considered an essential 8 worker job, and so sectors that were not 9 considered essential labor pools were 10 available to a higher extent during that 11 time. That's part of it. Couldn't say that 12 that's the whole thing. The market was in a 13 steep upturn regardless. 14 Q I see. So during COVID the surplus of 15 available labor facilitated the growth of the 16 solar capacity in 2020 and in 2021? 17 MR. SCHMIDT: Objection to form. 18 A In general I think it's fair to say 19 that. And that assisted the ability to 20 install a lot. 21 But obviously, as I stated earlier, the 22 market is -- you know, it takes a couple of	47 1 MR. SCHMIDT: Same objection. 2 A I found the individuals at CAB to be 3 good people to work with. 4 Q Which individuals at CAB have you found 5 to be good people to work with? 6 MR. SCHMIDT: Objection. Relevance. 7 A Yeah, I don't know how that's relevant. 8 I have interfaced with only a few 9 different people at CAB, mostly Allen and 10 Tim. 11 Q Allen Smith and Tim Wedding; is that 12 right? 13 A Yes. That's correct. 14 Q Did CAB tell you about its mission to 15 employ blind and disabled persons? 16 MR. SCHMIDT: Objection. Relevance. 17 A It's in their name. 18 Q What do you think about CAB's mission to 19 employ blind and disabled persons? 20 MR. SCHMIDT: Objection. Relevance. 21 A Are you asking for a personal opinion, 22 or are you asking for -- what are you asking
46 1 years to build these things, so the labor 2 demand, which as you can see from the graph, 3 would have increased dramatically in 2020, 4 was facilitated by availability of labor. 5 And sometimes availability of labor can 6 constrain the speed at which projects can 7 occur. 8 Q How long have you been working with the 9 patent owner CAB? 10 MR. SCHMIDT: Object to form. 11 Foundation. 12 A I started discussions with them in 2013. 13 Q Is CAB one of your longest running 14 clients? 15 MR. SCHMIDT: Object to form. 16 A Among the top 25, maybe. 17 Q Do you like working with CAB? 18 MR. SCHMIDT: Object to form. 19 Relevance. 20 A What do you mean by "like"? 21 Q Do you prefer working with CAB over 22 other similarly situated clients of yours?	48 1 for? 2 Q Your personal opinion. 3 MR. SCHMIDT: Objection. Relevance. 4 A It's certainly unique. 5 Q Do you think CAB's mission to employ 6 blind and disabled persons is good? 7 MR. SCHMIDT: Objection. Form. 8 Relevance. 9 A To quote Jesus Christ, "What is good?" 10 Q When did you first learn about CAB? 11 A In 2013. 12 Q How did you first learn about CAB? 13 A Funny you should ask that. I believe 14 Page 16, Paragraph 36, goes into some detail 15 on that subject. It says that "In October of 16 2013, I attended Solar Power International 17 trade show in Chicago, Illinois." 18 And 37 says, "I first learned of CAB at 19 the 2013 SPI -- stands for Solar Power 20 International -- show." 21 Q Yeah, in that Paragraph 36 you're 22 referring to, you say that "SPI has been one

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49 1 of the solar industry's leading trade shows." 2 What do you mean by "leading trade 3 shows"?" 4 A Trade shows are common in every 5 industry. And so Solar Power 6 International – and now it's called RE, was 7 among the first, if not the first of these 8 types of trade shows. It is and has been the 9 largest over the last nearly 30 years, about 10 28 years. But there are other trade shows. 11 Intersolar is another trade show, which 12 is the largest in Europe, and they do trade 13 shows in the United States as well. And then 14 China has SNEC, which is the largest trade 15 show in the world with billions of people. I 16 don't know. It's a lot of people. Not 17 billions but more people that you can 18 imagine. 19 Q Have you ever been an exhibitor at SPI? 20 A No. 21 Q How many days did you attend the 2013 22 SPI trade show?	51 1 A I don't recall exactly. I believe in my 2 thousands of interactions at these trade 3 shows, somebody came up to me and said, "You 4 should go by and take a look at CAB's 5 exhibit," and so I did. 6 Q What do you recall about CAB's exhibit 7 at the 2013 SPI trade show? 8 A Not much. I don't remember much. I 9 just remember meeting Allen Smith. That's 10 what sticks in my mind the most. And as in 11 most exhibits, they had some of their 12 products sitting or hangers, various things 13 in their booth. They may have had a mock-up 14 of what they were considering for the solar 15 industry, things like that. It was a long 16 time ago. 17 Q Do you recall what products they had at 18 their exhibit? 19 A I don't recall exactly at all. 20 Q What was the mock-up that you're 21 referring to? 22 A Again, that was 11 years ago, so I don't
50 1 A I couldn't tell you. Normally it's 2 three or four days. I often teach a class 3 during these trade shows, so the class might 4 be the day before the trade show, and then 5 the trade show is three days after. 6 That's common, but I can't remember what 7 the 2013 show was. That's 11 years ago, and 8 a lot has happened since then. 9 Q How many attendees were at the 2013 SPI 10 trade show? 11 A I don't know at all. I couldn't tell 12 you. You'd have to go back. I'm sure they 13 have statistics on it. But not nearly as 14 large as the one that just happened that had 15 over 50,000 in Anaheim a few weeks ago. 16 So I would say it's probably more in the 17 10- to 15,000 range at the Chicago trade 18 show, but that's a guess. And so don't hold 19 me to it. 20 Q What brought you to CAB's exhibit at the 21 2013 SPI trade show? 22 MR. SCHMIDT: Object to form.	52 1 recall exactly what they've – what they put 2 in their booth at the time. And I've seen 3 their booth many times since then, so it 4 would be easy to conflate various years' 5 exhibits with one another because the only 6 thing that really stands out in my mind is my 7 meeting Allen Smith for the first time. 8 Q What do you recall about meeting Allen 9 Smith for the first time? 10 A He was a well-spoken gentleman, and we 11 discussed what his company's vision was for 12 the solar industry. And I believe our 13 discussion, our first discussion he related 14 that he was told by another individual or 15 maybe multiple individuals that he should 16 talk to me. 17 Q What was Mr. Smith's vision for the 18 company? 19 A To use CAB's aboveground cable 20 management system to provide cable management 21 for solar projects. 22 Q What was your impression of that idea?

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53 1 MR. SCHMIDT: Object to form. 2 A As a pioneer in the solar industry, I'm 3 always looking for new ideas that could 4 possibly benefit the solar industry as an 5 advocate of the solar industry. And I have 6 been on the forefront of many, many 7 developments in our industry, and so this was 8 intriguing. 9 Q In Paragraph 38 of your declaration, 10 when you say that CAB "offered an 11 above-ground cable management system," what 12 components are you referring to by saying the 13 "above-ground cable management system"? 14 A Are you speaking about at the time in 15 2013? 16 Q Is that the -- is 2013 the time that 17 you're referring to in Paragraph 38? 18 A So that's when I first learned of CAB 19 and learned about them proposing the use of 20 cable hangers suspended from a messenger wire 21 to support various types of electrical cables 22 between solar panels and inverters, as it	55 1 exhibit did CAB offer any literature about 2 its products? 3 A I don't recall. 4 Q Was CAB actually offering any products 5 for sale at the 2013 SPI trade show? 6 A I don't recall. 7 Q In Paragraph 43 of your declaration, you 8 say at the 2013 SPI trade show CAB requested 9 that Brooks Engineering evaluate CAB's 10 aboveground cable management system and 11 prepare a white paper. 12 Was that Alan Smith that requested you 13 prepare a white paper? 14 A That is my recollection. 15 Q Did you accept CAB's request for a white 16 paper on the spot at the 2013 SPI trade show? 17 A I can't say whether or not I accepted 18 that. I think we discussed it and agreed to 19 discuss it more after the trade show. And 20 so, typically, what would occur is they would 21 request a quote for a statement of work 22 and -- where I would draft some things and
54 1 states in Paragraph 27. 2 And so from a high level, it was focused 3 on the fact that a messenger wire was being 4 used as the structural element to hold up 5 hangers that would then hold up cables. And 6 that's really the extent of the vision at the 7 moment in time that I was exposed to this 8 product. 9 Q I see. So by "above-ground cable 10 management system," you mean a messenger wire 11 and cable hangers? 12 A That was the essence of what I said here 13 in the declaration, conceptually. Didn't 14 mean that was every piece and part that the 15 system would necessarily use. It's just 16 simply that from a conceptual point of view 17 getting my head around what are you doing, 18 that was the concept. 19 (Whereupon, a recess was taken 20 from 10:56 a.m. until 11:07 21 a.m.) 22 Q Mr. Brooks, at CAB's 2018 SPI trade show	56 1 then, for their review, and then we'd go back 2 and forth to come to an agreement on what 3 such a white paper would be and what it would 4 cover. And then -- and decide on a scope for 5 that. 6 Q What was the scope of that white paper? 7 A Yeah, on a high level the scope was 8 simply that: Is this wiring method -- 9 because we're talking about a wiring 10 method -- is this wiring method allowed in 11 the National Electrical Code and other 12 industry standards? And if so, how -- what 13 would be the various sections of the code 14 that would dictate the use of this wiring 15 method for solar systems. And a bit about 16 things like, some of the main concerns that 17 POSITA would have is -- person of ordinary 18 skill in the art -- would have is what are 19 the regulations for how far the hangers would 20 have to be apart? How closely it have to be 21 together? Or how the wires would have to be 22 secured? And what the ampacity of the

57 1 conductors would to, ampacity would be how 2 large the conductors would have to be 3 relative to the amount of current they're 4 carrying. 5 So these are all things that an engineer 6 would have to essentially get their head 7 around in addition to just, is it compliant 8 with the code? 9 Q How much did you charge for this white 10 paper? 11 A I don't recall exactly, but I believe 12 the number was 5K, something in that range. 13 Q Was that reflective of your standard 14 rates at this time for authoring a white 15 paper? 16 MR. SCHMIDT: Objection to form. 17 A It was probably similar, as we stated 18 and talked about this earlier. 19 Q Did you offer CAB any discounts from 20 your normal rate for authoring this white 21 paper? 22 MR. SCHMIDT: Object to form.	59 1 And then pictures from CAB of mockups, 2 just to get an idea of what conceptually they 3 were talking about. And I tried to use some 4 of those pictures in my white paper document, 5 because I was trying to explain something 6 that wasn't obvious to me when I first 7 looked, or heard about it. So I was trying 8 to explain that to engineers and authorities 9 having jurisdiction that would have to try to 10 get their head around what this new method 11 was. 12 Q Prior to issuing this white paper, did 13 you give CAB any feedback on its proposed 14 system? 15 MR. SCHMIDT: Objection to form. 16 A I don't recall exactly. 17 Q While you were authoring this white 18 paper, did you communicate with CAB? 19 A It would be typical and normal for me to 20 go back and forth and ask questions, clarify, 21 help make sure that my understanding of what 22 they were proposing was accurate, so that I
58 1 A I don't believe so. 2 Q What materials did you review for your 3 analysis in evaluating CAB's messenger-based 4 system? 5 A If your referring -- you're referring to 6 documents? 7 Q I'll rephrase. 8 What documents did you review for your 9 analysis in evaluating CAB's messenger-based 10 system for this white paper? 11 A Obviously, the National Electrical Code, 12 since it was -- the primary focus of the 13 white paper was compliance with the National 14 Electrical Code. But, also, NECA 1, which is 15 mentioned in the declaration, which is an 16 installation standard that the National 17 Electric Contractors Association had 18 produced. 19 Which is basic best practices for 20 installation of electrical wiring. 21 Those are two of the most prominent that 22 are listed here in my declaration.	60 1 could accurately asses that. 2 Q At this time, were you already aware of 3 the NEC requirements that required the 4 separation of AC and DC cables? 5 A As a direct participant of that 6 discussion, which turned out to be a very 7 painful discussion for me in a debate with a 8 colleague of mine for about 45 minutes in the 9 panel, I was excruciatingly aware of that to 10 this day. 11 Q Why was the conversation around 12 separation of AC and DC cable a painful one? 13 A Because I believe that it was 14 unnecessary, and was not consistent with the 15 rest of the National Electrical Code. And my 16 colleague believed otherwise, still to this 17 day, who happens to be the chair of the code 18 making panel, who I will see and have a beer 19 with on Sunday night, who's now a friend of 20 mine. 21 But we still disagree on the subject, 22 and we will be talking about it next week.

61 1 Q Did you inform CAB that their system 2 would need to separate AC and DC cables? 3 A At the time, I don't recall that 4 particular question coming up, it could have, 5 but I just don't remember it. 6 Q Did you factor in the need to separate 7 AC and DC in your evaluation of CAB's system? 8 A My very first version of it, I don't 9 recall. I have versions of it that, you 10 know, go back to my original drafts and it 11 was not in original drafts, but I know that 12 we did incorporate it sometime in 2014. So 13 that the document that's referred to in here 14 certainly in mid -- in September of 2014, did 15 discuss that. 16 Q So after issuing the first white paper, 17 you issued an updated version on September 18 18 of 2014, correct? 19 A Yes, that was a few versions in at the 20 time. That may have been the first version 21 that actually went to public. I couldn't 22 tell you. You would have to find that out	63 1 six years ago, or more. So it would have 2 been that they either had certification or 3 working on finishing certification on this 4 product. And so that's my memory on the 5 subject. 6 Q What were your initial impressions about 7 CAB's integrated grounding system? 8 MR. SCHMIDT: Object to form. 9 A My initial impressions were that it was 10 a good idea. 11 Q Why did you think it was a good idea? 12 A I believe in my declaration it discusses 13 the fact in -- I would turn to 14 Paragraph 53 -- 52 and 53, where it talks 15 about that these systems typically required a 16 separate grounding conductor for equipment 17 grounding. And these are very expensive 18 conductors. They're typically copper, which 19 can be three times as expensive as aluminum. 20 And therefore, if there is a way to reduce -- 21 if there's a way to eliminate that conductor 22 in the CAB system, as it had been applied up
62 1 from CAB, which version was the first version 2 that was customer-facing. 3 Q How much did you charge for this updated 4 white paper? 5 A I don't recall. 6 It was a fairly incidental update, so I 7 don't know. I may not have charged anything 8 for the update. 9 Q You first learned about CAB's integrated 10 system in January of 2018, correct? 11 A When you mention "integrated system," 12 you're referring to Paragraph 50? 13 Q Yes. 14 A It states, "In January 2018, CAB 15 informed me that it had developed a new 16 integrated grounding system." 17 Q What do you mean by "CAB informed" you? 18 A They told me or emailed me. 19 Q What information did they provide you 20 via email or on the phone about their new 21 integrated grounding system? 22 A I don't recall. That was about	64 1 to that point in all CAB systems, that would 2 be a significant cost benefit to customer. 3 Even though the cost of doing the 4 integrated system might be a slight increase 5 in cost of CAB's system to the customer. 6 Q Did you contribute to the development of 7 CAB's integrated grounding system in any way? 8 MR. SCHMIDT: Objection to form. 9 A I don't recall directly. 10 Q Sorry, what do you mean by "directly"? 11 A I did not directly consult with them on 12 this. 13 Q So you did not contribute to the 14 development of CAB's integrated grounding 15 system in any way? 16 MR. SCHMIDT: Asked and answered. 17 A I don't recall being directly involved. 18 Q What did you review in order to 19 determine if CAB's integrated grounding 20 system was NEC compliant? 21 A I'd have to look at my declaration for a 22 moment here.

65 1 To the best of my recollection, it was 2 reviewing their certification process since 3 that's -- I sit on UL2703, which is mentioned 4 in the declaration, which would cover these 5 types of components for photovoltaic systems. 6 And so I would have been reviewing their 7 certifications, the various materials and 8 parts that they had evaluated and certified 9 for the purpose, to see if they were 10 consistent with how these things are to be 11 installed. 12 And comparing it to, essentially, the 13 standard method, which I think they call it 14 the standard method, whereby you have a 15 separate grounding conductor that has to have 16 bonding jumpers to the piles to the messenger 17 wire and the like. And so, essentially, this 18 integrated system, as they refer to it, has 19 to perform all the functions that historic 20 separate wire perform, and so I'd be 21 evaluating to make sure it would include 22 things like the clips that holds the	67 1 analysis of CAB's integrated grounding 2 system? 3 A Because that is the standard that UL has 4 determined must be complied with for any 5 product used for grounding and bonding in the 6 total intake system. 7 Q What does it mean to be a panel member 8 on UL2703? 9 A It's actually a technical committee, as 10 they call. It used to be called a standards 11 technical panel, SEP. They -- about 12 two years ago changed the name to technical 13 committee. The standards technical panel, or 14 the technical committee, same firm, is made 15 up of a broad group of individuals from 16 different backgrounds who are specifically 17 interested and informed in the area that the 18 standard covers. 19 And you apply to sit on the standards 20 technical committee, or panel technical 21 committee, using those things 22 interchangeably.
66 1 messenger wire to the support bracket, that 2 goes on the vertical support of the solar 3 equipment, would have to have an evaluation 4 of a grounding bonding device, which it did, 5 that's one example. 6 The ampacity capability. The capability 7 of this special copper clad conductor. 8 Messenger wire integrated -- messenger wire 9 that it was adequate for the applications 10 that it was going to be used for. Those are 11 the kind of things. 12 Q What is UL2703? 13 A Glad you asked that. 14 That would be on Page 9, Paragraph 27. 15 Since I've been on so many standards 16 committees the names escape me. 17 I believe the current term for UL2703 is 18 "mounting systems, mounting devices, clamping 19 retention devices and ground lugs for use 20 with flat-plate photovoltaic modules and 21 panels." 22 Q And why was UL2703 relevant to your	68 1 You provide your credentials, and you're 2 evaluated based on a set of ANSI criteria, 3 A-N-S-I, American National Standards 4 Institute, to determine if there is room on 5 the panel for your particular stakeholder 6 area. And if so, and you have the proper 7 credentials, then you are permitted and -- to 8 join the technical committee. 9 Q Do you help draft 2703? 10 A Portions of it, yes. 11 Q Around what time did you and others 12 begin drafting UL2703? 13 A That's a long time ago. So to know 14 exactly, I was the chair of the Fire 15 Classification Committee, Fire Testing 16 Committee for five years on that. 17 It actually originally started in 18 UL1703, which is also stated here, which has 19 to do with flat-plate photovoltaic modules 20 and panels. And so the -- that five-year 21 period was between 2008 and 2013. 22 The standard was issued around that

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69 1 time, the work that I did got folded into the 2 standard probably 2015, 2016. This is 3 really -- don't hold me to this -- but this 4 is -- ten years ago on the solar industries 5 is like four dog lifetimes. 6 So things that seem like they were 7 forever ago actually were only a decade ago. 8 So the grounding and bonding sections of 9 2703, which were the first parts that was -- 10 the outline of investigation, which is kind 11 of the starting point for standard occurred 12 somewhere around that time period, 2013, 13 maybe 2012, as early as that. It's been a 14 longtime coming and grounding and bonding is 15 a specialty of mine. 16 I'm well-known for my work in that area, 17 and so, although I didn't draft the grounding 18 and bonding sections, I was definitely 19 involved with it. 20 Q So did you determine that the CAB's 21 integrating grounding system was permitted by 22 UL Section 1703?	71 1 EXAMINATION BY 2 MR. SCHMIDT: 3 Q I have a question or two for Mr. Brooks. 4 Mr. Brooks, in response to Mr. Sweeny's 5 last question, before our break, before he 6 passed the witness, you stated that it was a 7 fairly straightforward process going from the 8 separate grounding conductor to using this 9 special messenger wire, copper clad messenger 10 wire as the grounding conductor. 11 Do you recall saying that? 12 A I recall something to that effect. 13 Q What did you mean by that, that it was a 14 "fairly straightforward process" of going 15 from one to the other? 16 A I wanted to refer to my declaration, 17 because it talks about the role of the 18 grounding wire and that helps understand why, 19 as an expert in the grounding field, I 20 believe that it was a straightforward 21 process. 22 So Paragraph 52, says:
70 1 MR. SCHMIDT: Objection to form. 2 A My goal was to see that it had the 3 proper certifications because that would be 4 what the engineer would be looking for in 5 order to apply it. They obviously had a 6 method already being used routinely that was 7 working and that was compliant; and so 8 therefore, it was a fairly straightforward 9 process of going from the separate grounding 10 conductor to using this special messenger 11 wire, copper clad messenger wire as the 12 grounding conductor. 13 MR. SWEENEY: Great. We pass the 14 witness. 15 MR. SCHMIDT: Okay. Let's just have a 16 couple-minute break to huddle and 17 we'll back to you in no more than 18 five minutes. 19 MR. SWEENEY: Sounds good, thanks. 20 (Whereupon, a recess was taken 21 from 11:33 a.m. until 11:48 22 a.m.)	72 1 "Prior to CAB's introduction of 2 its integrated grounding system in 3 order to protect against issues such as 4 lighting strikes, electrical shorts, 5 undesirable current, a grounding 6 conductor separate from a messenger 7 wire was required to provide that 8 effective ground fault current path," 9 which is a term of art in the National 10 Electrical Code. 11 Obviously, this new integrated 12 messenger -- integrated grounding product 13 would have to perform all the roles that 14 grounding wire would have been used 15 traditionally for -- ever since the inception 16 of this product, would be necessary for. 17 This past Tuesday, I was in 18 South Carolina at a hundred megawatt plant 19 where they happened to have a CAB system that 20 was installed in early 2020, just four years 21 ago, and that system had this separate 22 grounding wire and a very large copper cable

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73 1 in the system. 2 So it's been used, obviously, over the 3 years. And it had bonding jumpers, as is 4 talked about in the last sentence of that 5 paragraph, "To each metal pile a bonding 6 jumper to the messenger cable and to whatever 7 parts it was required to provide an expected 8 ground fault current path to." 9 And so, essentially, since that was a 10 standard method, and well-understood and the 11 roles of that separate grounding wire had 12 been applied for many years at that time, 13 certainly, in the 2018 time frame, upon the 14 order of four years. It was not a mystery as 15 to what the ground conductor was required to 16 do. 17 So with this new concept introduced by 18 CAB, it was simply to -- that's why I said it 19 was straightforward, all the roles that 20 separate wire performed would, now, have to 21 be performed by this special copper clad 22 cable.	75 1 straightforward? I was referring to the 2 evaluation of the compliance, because that 3 was my role and that was the role of this 4 paper. It was not to judge how simple or 5 straightforward the idea was. That was not 6 my role. 7 Therefore, I was being called to 8 determine whether or not this was a code 9 compliant method and specifics related to 10 that code compliance. As I stated, the only 11 way it was done prior to this was with a 12 separate conductor. And so this was a new 13 and novel approach to that process and it had 14 some clear benefits from a cost and it's 15 talked about in my declaration. 16 That there were cost benefits, at the 17 bottom of Paragraph 53, at the top of 18 Page 22, there was significant cost savings 19 both in terms of material and labor. 20 MR. SCHMIDT: I have no further 21 questions. 22 MR. SWEENEY: Nothing further on my
74 1 And there were some other parts of that 2 that were also somewhat novel. I mentioned 3 the grounding clamp that held the wire, that 4 they had a special certification on and other 5 things as I mentioned before about the 6 ampacity, the conductor, and things like 7 that. 8 So these were, from my perspective as an 9 expert in the field, straightforward from a 10 standpoint -- point of evaluating the code 11 compliance of that, and that was my role. 12 Q So when you said it was straightforward, 13 were your referring to whether the idea of 14 going from a separate grounding conductor to 15 a method that used the messenger wire as both 16 a support structure and a grounding conductor 17 that that idea was straightforward? 18 A No, no. 19 MR. SWEENEY: Objection to form. 20 A I'm referring to -- so the question, as 21 I understand it is, was the idea 22 straightforward or was the evaluation	76 1 side either. 2 (Whereupon, this examination was 3 concluded at 11:55 a.m.) 4 5 6 _____ 7 WILLIAM BROOKS, PE 8 9 10 Subscribed and sworn to 11 before me on this ____ day 12 of _____, _____. 13 14 _____ 15 Notary Public 16 17 18 19 20 21 22

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Affordable Wire Management, Exhibit No. EX1046

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77 1 2 INDEX 3 WITNESS: WILLIAM BROOKS, PE 4 EXAMINATION BY PAGE 5 MR. SWEENEY 5 6 MR. SCHMIDT 71 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	79 1 I further certify that I am not related 2 to any of the parties to this action by blood or 3 marriage, I am not employed by or an attorney to 4 any of the parties to this action, and that I am 5 in no way interested, financially or otherwise, in 6 the outcome of this matter. 7 IN WITNESS WHEREOF, I have hereunto set 8 my hand this 14th day of October, 2024. 9 10 11 12 13 14 <i>Kiara Miller</i> 15 16 KIARA MILLER 17 18 19 20 21 22
78 1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC 2 3 I, KIARA MILLER, Certified Reporter 4 and Notary Public within and for the State of 5 New York do hereby certify: 6 That WILLIAM BROOKS, PE, the 7 witness whose deposition is hereinbefore set 8 forth, was duly sworn by me before the 9 commencement of such deposition and that such 10 deposition was taken before me and is a true 11 record of the testimony given by such 12 witness. 13 I further certify that the adverse party, 14 CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND 15 HANDICAPPED, INC., was represented by counsel at 16 the deposition. 17 I further certify that the deposition of 18 WILLIAM BROOKS, PE occurred remotely via 19 mobile videoconference on Thursday, October 10, 20 2024, commencing at 9:39 a.m. to 11:55 a.m. 21 22	

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Transcript of William Brooks, PE
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