

<p style="text-align: center;">Page 1</p> <p style="text-align: center;">UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE PATENT TRIAL AND APPEAL BOARD</p> <hr/> <p>WIRTGEN AMERICA, INC.) Petitioner) Case IPR2022-01397 v.) U.S. Patent 9,975,538 CATERPILLAR INC.) Patent Owner))</p> <hr/> <p style="text-align: center;">Deposition of DR. ABID KEMAL Tuesday, September 12, 2023 Palo Alto, California</p> <p>Stenographically Reported by: HEATHER J. BAUTISTA, CSR, CRR, RPR, CLR Realtime Systems Administrator California CSR License #11600 Oregon CSR License #21-0005 Washington License #21009491 Nevada CCR License #980 Texas CSR License #10725</p> <hr/> <p style="text-align: center;">DIGITAL EVIDENCE GROUP 1730 M Street, NW, Suite 812 Washington, D.C. 20036 (202) 232-0646</p>	<p style="text-align: center;">Page 2</p> <p>1 DEPOSITION of DR. ABID KEMAL, taken before 2 Heather J. Bautista, CSR No. 11600, a Certified 3 Shorthand Reporter for the state of California, with 4 principal office in the county of Santa Clara, 5 commencing on Tuesday, September 12, 2023, 9:09 a.m., at 6 601 California Avenue, Palo Alto, California 94304. 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22</p>
<p style="text-align: center;">Page 3</p> <p>1 APPEARANCES OF COUNSEL: 2 For Petitioner: 3 Patterson Intellectual Property Law, P.C. 4 BY: WILLIAM E. SEKYI, ESQ. 5 NATHAN I. NORTH, ESQ. (Remote) 6 1600 Division Street 7 Suite 500 8 Nashville, Tennessee 37203 9 Phone: (615) 242-2400 / Fax: (615) 242-2221 10 wes@iplawgroup.com 11 nin@iplawgroup.com 12 13 For Patent Owner: 14 Wilson Sonsini Goodrich & Rosati 15 Professional Corporation 16 BY: MATTHEW A. ARGENTI, ESQ. 17 TASHA M. THOMAS, ESQ. (Remote) 18 650 Page Mill Road 19 Palo Alto, California 94304-1050 20 Phone: (650) 493-9300/Fax: (650) 493-6811 21 margenti@wsgr.com 22 tthomas@wsgr.com</p>	<p style="text-align: center;">Page 4</p> <p>1 INDEX OF EXAMINATION 2 PAGE 3 DR. ABID KEMAL, 4 EXAMINATION BY MR. SEKYI 6 5 6 --000-- 7 8 (NO EXHIBITS WERE MARKED OR SUBMITTED FOR ATTACHING TO THIS 9 DEPOSITION TRANSCRIPT) 10 11 12 13 14 15 16 17 18 19 20 21 22</p>

<p style="text-align: right;">Page 5</p> <p>1 Tuesday, September 12, 2023</p> <p>2 9:09 a.m.</p> <p>3 --oOo--</p> <p>4 THE STENOGRAPHER: Good morning. We are on</p> <p>5 the record. Today's date is Tuesday, September 12,</p> <p>6 2023, and the time is 9:09 a.m.</p> <p>7 This is the deposition of Dr. Abid Kemal in</p> <p>8 the matter of Wirtgen America, Inc., v. Caterpillar,</p> <p>9 Inc., Case No. IPR2022-01397, venued in the United</p> <p>10 States Patent and Trademark Office.</p> <p>11 My name is Heather Bautista, and I am a</p> <p>12 certified stenographer licensed by the State of</p> <p>13 California. My license number is 11600.</p> <p>14 As the deposition officer, I will be</p> <p>15 retaining my duties and responsibilities under the</p> <p>16 Code.</p> <p>17 At this time, I'll ask all counsel to state</p> <p>18 your appearance for the record, starting with the</p> <p>19 noticing attorney, please.</p> <p>20 MR. SEKYI: My name is William Sekyi of</p> <p>21 Patterson Intellectual Property Law Group</p> <p>22 representing Wirtgen, and on the line with me is</p>	<p style="text-align: right;">Page 6</p> <p>1 Nathan North.</p> <p>2 MR. ARGENTI: Matt Argenti, Wilson Sonsini,</p> <p>3 on behalf of patent owner Caterpillar, and also</p> <p>4 attending remotely is my colleague Tasha Thomas.</p> <p>5 DR. ABID KEMAL,</p> <p>6 having been first duly sworn, was examined and</p> <p>7 testified as follows:</p> <p>8 THE WITNESS: I do.</p> <p>9 THE STENOGRAPHER: Thank you.</p> <p>10 Please state your full name for the record.</p> <p>11 THE WITNESS: My name is Abid Kemal,</p> <p>12 spelled A-b-i-d; last name is spelled K-e-m-a-l.</p> <p>13 THE STENOGRAPHER: Thank you.</p> <p>14 Counsel, you can begin.</p> <p>15 DIRECT EXAMINATION</p> <p>16 BY MR. SEKYI:</p> <p>17 Q. Good morning, Dr. Kemal.</p> <p>18 A. Good morning.</p> <p>19 Q. You may understand that my name is William</p> <p>20 Sekyi, and I'm here to represent Wirtgen America,</p> <p>21 and I'd like to ask you a few questions.</p> <p>22 Do you understand that?</p>
<p style="text-align: right;">Page 7</p> <p>1 A. Yes, I do.</p> <p>2 Q. Okay.</p> <p>3 Have you been deposed before?</p> <p>4 A. Yes, I have.</p> <p>5 Q. How many times?</p> <p>6 A. I think it's a bit in excess of about 30</p> <p>7 times.</p> <p>8 Q. And were those -- what kind of cases were</p> <p>9 those involved in?</p> <p>10 A. There were a lot of times litigation cases.</p> <p>11 Some were -- also some led to trials, jury trials as</p> <p>12 well as bench trials.</p> <p>13 Q. Did any of those cases involve -- did any</p> <p>14 of those times where you gave a deposition involve</p> <p>15 patent cases?</p> <p>16 A. No.</p> <p>17 Q. Okay.</p> <p>18 Have you ever been an expert before in a</p> <p>19 patent case?</p> <p>20 A. No.</p> <p>21 Q. Have you ever testified at trial before?</p> <p>22 A. Yes, I have.</p>	<p style="text-align: right;">Page 8</p> <p>1 Q. How many times?</p> <p>2 A. I think it's on the order of about six</p> <p>3 times.</p> <p>4 Q. Okay.</p> <p>5 Is there any reason -- medication,</p> <p>6 illness -- that would prevent you from answering the</p> <p>7 questions fully and truthfully today?</p> <p>8 A. No.</p> <p>9 Q. Okay.</p> <p>10 Please remember to answer verbally. I'll</p> <p>11 endeavor to do the same so the court reporter can</p> <p>12 take it all down. Please try to avoid talking over</p> <p>13 me, and I will try to avoid talking over you.</p> <p>14 Again, so the court reporter can get everything</p> <p>15 down.</p> <p>16 Understand that?</p> <p>17 A. Yes.</p> <p>18 Q. Okay.</p> <p>19 If you need a break, please let me know.</p> <p>20 I'll try to give breaks periodically, stop for</p> <p>21 breaks periodically around every hour, hour and a</p> <p>22 half, thereabouts. But if you need a break sooner,</p>

<p style="text-align: right;">Page 9</p> <p>1 please let me know, and I will try to accommodate</p> <p>2 you.</p> <p>3 A. I will do that.</p> <p>4 Q. But I just ask that if I have asked the</p> <p>5 question, if you would please finish answering the</p> <p>6 question before we go for a break.</p> <p>7 Do you understand that?</p> <p>8 A. Yes.</p> <p>9 Q. And, of course, if you don't understand a</p> <p>10 question I've asked, please ask me to clarify, and</p> <p>11 I'll try to do my best to explain it again so you</p> <p>12 can better understand; is that fair?</p> <p>13 A. That is.</p> <p>14 Q. Okay.</p> <p>15 So you understand that you're here to</p> <p>16 answer questions about your declaration in</p> <p>17 IPR2022-01397?</p> <p>18 A. So I do not recollect the number of the</p> <p>19 IPR, but I'm here to answer questions regarding my</p> <p>20 declaration.</p> <p>21 Q. And was that your declaration -- that was</p> <p>22 your declaration involving U.S. Patent 9,975,538?</p>	<p style="text-align: right;">Page 10</p> <p>1 A. I recall it as Patent '538.</p> <p>2 Q. Okay.</p> <p>3 And the inventor was Mr. Aardema; is that</p> <p>4 correct?</p> <p>5 A. That sounds about correct.</p> <p>6 Q. Let me hand you --</p> <p>7 (Stenographer clarification.)</p> <p>8 Q. (By Mr. Sekyi) Let me hand you what's</p> <p>9 already been marked Exhibit 2001 in the case.</p> <p>10 Dr. Kemal, do you recognize this document?</p> <p>11 A. I recognize the first page of the document.</p> <p>12 Q. Can you turn to the last page of the</p> <p>13 document. Sorry, the second-to-the-last page,</p> <p>14 Page 45. Do you see your signature on that page?</p> <p>15 A. Yes, I do.</p> <p>16 Q. Is that your signature?</p> <p>17 A. Yes, it is.</p> <p>18 Q. Please take a look at the document and</p> <p>19 confirm to me whether this is the declaration -- a</p> <p>20 copy of the declaration you submitted in this IPR.</p> <p>21 (Stenographer clarification.)</p> <p>22 THE WITNESS: So I've flipped through the</p>
<p style="text-align: right;">Page 11</p> <p>1 pages, and, of course, I have not read the</p> <p>2 declaration, but this appears to be substantially</p> <p>3 similar to what I submitted, so it does appear to be</p> <p>4 my declaration.</p> <p>5 Q. (By Mr. Sekyi) Now -- now, you understand</p> <p>6 that your declaration represents your direct</p> <p>7 testimony in this case; is that right?</p> <p>8 A. Yes, I do. I understand that.</p> <p>9 Q. And in that direct testimony, you offered</p> <p>10 opinions about the patentability of the '538 patent;</p> <p>11 is that right?</p> <p>12 A. Yes.</p> <p>13 Q. What materials did you consider in forming</p> <p>14 your opinions?</p> <p>15 A. So I do state that in the declaration. For</p> <p>16 the purposes of the declaration, the materials that</p> <p>17 are cited are listed on Page 46. These includes</p> <p>18 Exhibits No. 1001, 1003, 1005, 1006, 1012, 2003.</p> <p>19 I've also stated in my declaration the</p> <p>20 other materials that I have looked at in order to</p> <p>21 formulate my opinions.</p> <p>22 Q. So I notice on the table of contents, you</p>	<p style="text-align: right;">Page 12</p> <p>1 identify as Item 10, Appendix - Materials</p> <p>2 Considered; is that correct?</p> <p>3 A. Materials cited.</p> <p>4 Q. On Page i --</p> <p>5 A. Oh.</p> <p>6 Q. -- you identify Appendix - Materials</p> <p>7 Considered.</p> <p>8 Do you see that?</p> <p>9 A. I do. I do see that.</p> <p>10 Q. Okay.</p> <p>11 And that is at Page 46 of your declaration,</p> <p>12 is that correct, in the table of contents?</p> <p>13 A. Yes.</p> <p>14 Q. But at Page 46, you say "Materials Cited."</p> <p>15 A. That is correct.</p> <p>16 Q. Are there other materials considered beyond</p> <p>17 what is cited?</p> <p>18 A. Yes.</p> <p>19 So Page 46 lists the materials that I cited</p> <p>20 in my declaration. Materials that also were</p> <p>21 considered in formulating my opinions, I discuss</p> <p>22 them in my declaration. Let me point them. They</p>

<p style="text-align: right;">Page 13</p> <p>1 are listed in Paragraph 10 on Page 4.</p> <p>2 Q. Now, in Paragraph 10 on Page 4, you say</p> <p>3 that "in connection with my" -- "with this analysis,</p> <p>4 I have reviewed the '538 patent, including the</p> <p>5 claims of the '538 patent in view of the</p> <p>6 specification"; correct?</p> <p>7 A. Yes. I think you've read that correctly.</p> <p>8 Q. And that is what you did?</p> <p>9 A. I did.</p> <p>10 Q. You go on to say, "I have also reviewed the</p> <p>11 petition for inter partes review; the documents</p> <p>12 cited in the petition, including Dr. Jeffrey Stein's</p> <p>13 declaration, Ex 1003; the board's institution</p> <p>14 decision as well as the materials cited in this</p> <p>15 declaration."</p> <p>16 My question to you is: What is the</p> <p>17 difference between "reviewing" and "considering"?</p> <p>18 MR. ARGENTI: Objection. Form.</p> <p>19 THE WITNESS: So I received a number of</p> <p>20 documents from the client, and I, in the beginning</p> <p>21 of the project, looked at those materials, some in</p> <p>22 greater detail than others depending on the</p>	<p style="text-align: right;">Page 14</p> <p>1 relevancy that I was seeing, and -- and based on</p> <p>2 that review, I formulated my opinions that I have</p> <p>3 discussed in my declaration.</p> <p>4 Q. (By Mr. Sekyi) So is there a difference in</p> <p>5 your mind when, in your declaration, you refer to a</p> <p>6 document as "considered" versus a document</p> <p>7 "reviewed"?</p> <p>8 A. As I just stated in my previous answer, I</p> <p>9 looked at the documents; some in greater detail than</p> <p>10 others; reviewed some in greater detail than others;</p> <p>11 and decided the -- the documents that made more</p> <p>12 sense to go into more detail, and -- and reviewed</p> <p>13 those in more detail, as I stated. And then</p> <p>14 formulated my opinions based on that.</p> <p>15 So I don't know if there is a big</p> <p>16 difference between "review" or "consider," but that</p> <p>17 was my process as I just described to you.</p> <p>18 Q. Thank you.</p> <p>19 Dr. Kemal, do you happen to understand what</p> <p>20 the state of the art is in the context of assessing</p> <p>21 patent validity?</p> <p>22 A. So I've been informed about the legal</p>
<p style="text-align: right;">Page 15</p> <p>1 standards to use related to obviousness, and that is</p> <p>2 my understanding that is discussed in my</p> <p>3 declaration.</p> <p>4 Q. Dr. Kemal, I'm looking at -- let me</p> <p>5 rephrase the question.</p> <p>6 Where in the legal standard section of your</p> <p>7 declaration do you explain what the state of the art</p> <p>8 means?</p> <p>9 MR. ARGENTI: Objection. Form.</p> <p>10 THE WITNESS: The legal standards that I</p> <p>11 was talking about are discussed under Section 3 on</p> <p>12 Page 4 of my declaration in Paragraphs 12 through</p> <p>13 20.</p> <p>14 Q. (By Mr. Sekyi) Where in Paragraphs 12</p> <p>15 through 20 is there an explanation of what "the</p> <p>16 state of the art" means in the context of the '538</p> <p>17 patent?</p> <p>18 MR. ARGENTI: Objection. Form.</p> <p>19 THE WITNESS: So on -- in Paragraph 13, I</p> <p>20 state that "I have been advised that anticipation is</p> <p>21 about prior invention and, therefore, a single prior</p> <p>22 art reference must be found to disclose all elements</p>	<p style="text-align: right;">Page 16</p> <p>1 of the claimed invention arranged as in the claim.</p> <p>2 I have been further advised that it is not enough</p> <p>3 that the prior art references include multiple</p> <p>4 distinct teachings that may somehow be combined to</p> <p>5 achieve the claimed invention; rather, it is my</p> <p>6 understanding that the reference must clearly and</p> <p>7 unequivocally disclose the claimed invention or</p> <p>8 direct a person of ordinary skill in the art to the</p> <p>9 claimed invention without any need for picking,</p> <p>10 choosing, and combining various disclosures that are</p> <p>11 not directly related to each other in the</p> <p>12 reference."</p> <p>13 In Paragraph 14, I also state that "I</p> <p>14 understand the difference that" -- "I understand</p> <p>15 that differences between the prior art reference and</p> <p>16 a claimed invention," --</p> <p>17 (Stenographer clarification.)</p> <p>18 THE WITNESS: -- "however slight, invoke</p> <p>19 the question of obviousness, not anticipation."</p> <p>20 In Paragraph 15, I state that "I have been</p> <p>21 advised that a claimed invention is not patentable</p> <p>22 under 35 USC 103 if it is obvious. A patent claim</p>

<p style="text-align: right;">Page 17</p> <p>1 is unpatentable if the claimed invention would have 2 been obvious to a person of ordinary skill in the 3 art at the time the claimed invention was made." 4 "This means that even if all of the 5 requirements of the claim cannot be found in a 6 single prior art reference that would anticipate the 7 claim, a person of ordinary skill who knew about all 8 this prior art would have come up with the claimed 9 invention." 10 And I've been further advised that "the 11 ultimate conclusion of whether a claim is obvious 12 should be based on several factual determinations. 13 That is, a determination of obviousness required 14 inquiries into: One, the level of ordinary skill in 15 the field; two, the scope and content of the prior 16 art; and, three, what differences, if any, existed 17 between the claimed invention and the prior art; 18 and, four, any objective indicia of 19 non-obviousness." 20 In Paragraph 17, I discuss the 21 determination of the level of ordinary skill in the 22 field.</p>	<p style="text-align: right;">Page 18</p> <p>1 Q. (By Mr. Sekyi) So in Paragraph 17, how is 2 Paragraph 17 related to the state of the art? 3 MR. ARGENTI: Objection. Form. 4 THE WITNESS: Because in Paragraph 15, I 5 discuss that a patent claim is unpatentable if the 6 claimed invention would have been obvious to a 7 person of ordinary skill in the art at the time the 8 claimed invention was made. 9 And then Paragraph 17 discusses the level 10 of ordinary skill in the field. 11 Q. (By Mr. Sekyi) And what is the relevant 12 time for assessing -- for the purpose of your 13 validity analysis, what is the relevant date for 14 assessing the level of ordinary skill in the art? 15 A. So I did discuss that in my declaration, 16 and I testified to that. It is -- I can give you 17 the exact date, but it was May of 2015, May 18, 18 2015, which is discussed in Paragraph 36. 19 Q. As of May 18, 2015, were you a person of 20 ordinary skill in the art? 21 A. Yes, I was. 22 Q. Now, in Paragraph 5 of your declaration,</p>
<p style="text-align: right;">Page 19</p> <p>1 you state that you have extensive experience and 2 knowledge in the design and development of machine 3 powertrains; correct? 4 A. I have extensive experience and knowledge 5 on the design and development of machine powertrains 6 and control systems for controlling their operation. 7 Q. Can you describe what experience you've 8 had. 9 A. I go on in this paragraph to describe some 10 of that experience. 11 "As part of my mechanical engineering 12 education and training, I have studied automotive 13 engineering and gained advance knowledge of machine 14 powertrains, including internal combustion 15 engines" -- 16 (Stenographer clarification.) 17 THE WITNESS: -- "transmissions, 18 differentials, clutches, brakes, and other 19 components. I also have advance knowledge of fuel 20 and hydraulic systems, exhaust and emission systems, 21 and engine controllers. 22 "My graduate research at Stanford</p>	<p style="text-align: right;">Page 20</p> <p>1 University involved developing novel real-time 2 active and adaptive control strategies for heavy 3 equipment powertrain used in propulsion of marine 4 vessels and aircrafts. I worked on numerous 5 projects where I've assessed engine performance as a 6 function of load, including from transportation, 7 construction, and earth-moving machinery. 8 "I have developed and/or analyzed dynamic 9 control systems for, amongst others, combustion 10 systems, power generation hardware, powertrains, and 11 hydraulic systems. 12 "I have also assessed hydraulic system 13 failures as well as issues related to" -- 14 (Stenographer clarification.) 15 THE WITNESS: -- "fuel and exhaust systems 16 for automotive and marine sectors. 17 "I have repaired and replaced automotive 18 clutches and brakes. More recently, I have assisted 19 clients in developing safer electric powertrains for 20 vehicles." 21 Q. (By Mr. Sekyi) Dr. Kemal, I believe you 22 just read for me what I've read before in your</p>

<p style="text-align: right;">Page 21</p> <p>1 declaration. My question, I guess, is -- well, let 2 me step back. 3 This declaration you've submitted is a full 4 statement of your opinion; is that correct? 5 A. This declaration is a full statement of my 6 opinion as of today. 7 Q. Okay. Great. 8 And if -- a subject matter not disclosed in 9 here, okay, with respect to the opinions you've held 10 so far, for example, with respect to your 11 experience, then I take it that there's no more 12 information on what your experience is -- 13 MR. ARGENTI: Objection. Form. 14 Q. (By Mr. Sekyi) -- is that correct? 15 A. No, that is not correct. There 16 is definitely -- I can go definitely into a lot more 17 detail in -- with respect to the experience. 18 Q. Okay. 19 So my question to you is, aside from what I 20 can already read from your declaration, my question 21 is: What other experience have you had in machine 22 powertrains?</p>	<p style="text-align: right;">Page 22</p> <p>1 MR. ARGENTI: Objection. Form. 2 THE WITNESS: So I have, as I mentioned, 3 starting from my graduate studies, where I spent 4 almost four years developing control systems for 5 machine powertrains after I had my bachelor's 6 degree. This involved developing advanced active 7 and adaptive control algorithms for combustion 8 systems which are connected to loads. You, 9 obviously, are depending on or assessing combustion 10 systems or internal combustion engines with respect 11 to the load. And we use these algorithms to improve 12 the efficiency and performance of the engines. 13 These -- this research and development and 14 design work was done for very large powertrains that 15 are used in propulsion of marine vessels. The 16 research was funded by the Office of the Naval 17 Research for marine propulsion. The systems that I 18 developed over those four or five years also can be 19 used in the powertrain for aircraft. 20 In addition to that, I have had almost 25 21 years of experience at the current -- with my 22 current employer, where I've worked on numerous</p>
<p style="text-align: right;">Page 23</p> <p>1 projects where -- where control systems of 2 combustion and power generation systems, generators, 3 power plants, diesel engines were assessed, were -- 4 and were -- we looked at why systems were failing 5 and then came up with, in many cases, solutions and 6 developed solutions to prevent them from failing 7 going forward. 8 So if you look at the definition of both 9 the POSITA, where it's -- which was -- and I can 10 read that. 11 Q. I don't believe I've asked you about that. 12 A. Okay. 13 And I can continue on, but, you know, 14 that's -- we can talk for a long time. But as I 15 mentioned again, a lot of different components and 16 aspects of powertrains that I have worked on over my 17 career, which is now close to almost 40 years. 18 Q. Please name for me -- just the names -- 19 just the names of the powertrains that you've worked 20 on. 21 MR. ARGENTI: Objection. Form. 22 THE WITNESS: So I don't understand what</p>	<p style="text-align: right;">Page 24</p> <p>1 you mean by "the names." 2 Q. (By Mr. Sekyi) Sorry. Let me rephrase 3 that question. 4 Please name the machines whose powertrains 5 you worked on. 6 A. Okay. 7 So I have worked on powertrains of 8 generators from small generators to very large 9 generators. 10 I have worked on powertrains of marine 11 propulsion systems from, again, mid size to very 12 large systems. 13 I've worked on diesel engines and gasoline 14 internal combustion engines. 15 I have worked on control systems which 16 involve boilers. 17 I have worked on control systems for -- and 18 many times, these boilers are also used in 19 conjunction with powertrains, because they -- they 20 run steam turbines, which are, again, used as -- as 21 powertrains. So -- 22 Q. So when -- so you mentioned boilers were</p>

<p style="text-align: right;">Page 25</p> <p>1 connected to steam turbines. Were you involved in 2 the connection? Did your work involve the other 3 components of those powertrains beyond the boilers? 4 A. So my work did involve the turbines 5 themselves and the connection to the generators 6 through the transmissions. 7 Q. Good. 8 So in the -- in the steam turbine 9 powertrains, did they include an engine? 10 A. The steam -- the engine itself, the driver, 11 the power source is the boiler and the steam 12 turbine. 13 Q. Did those powertrains include a 14 transmission? 15 A. They always do. You always connect -- 16 almost always -- not always, but almost always 17 connect loads specifically for power generation 18 through a transmission, because the generator has to 19 run at a constant RPM. 20 Q. Did those -- were those transmissions 21 variable transmissions? 22 A. Yes.</p>	<p style="text-align: right;">Page 26</p> <p>1 Q. Were those transmissions continuously 2 variable transmissions? 3 A. I will have to go back and check on that. 4 I don't recall as I sit right now. And I'm talking 5 specifically with respect to the steam turbine 6 experience. 7 Q. Did those -- were -- did those turbines 8 have multiple discrete gears. Sorry. Let me 9 rephrase that. 10 Could those transmissions change between 11 multiple discrete gears? 12 A. As I sit here right now, I don't recall 13 exactly the internal construction of the 14 transmission in that particular -- in that 15 particular -- in that particular project. 16 Q. What was the output -- what were the 17 outputs of those powertrains connected to? 18 A. For that particular system -- or, actually, 19 a couple of those systems, they're connected to 20 generators. And generators have to run on a 21 constant RPM, no matter what load they are -- they 22 have on -- on. So it is a very similar problem set</p>
<p style="text-align: right;">Page 27</p> <p>1 as the rotor running at a constant RPM while the 2 load is changing. 3 Q. Did those powertrains include a controller 4 connected to the engine? 5 A. Yes. 6 Q. Did those powertrains include a controller 7 connected to the transmission? 8 A. That, I do not recall right now. 9 Q. Did those transmissions -- could the output 10 of those transmissions be controlled to change their 11 speeds respective to their inputs? 12 A. Yes. 13 Q. How is that achieved? 14 A. It is typically achieved with a control 15 algorithm and a control system. The control system 16 involves sensors that pick up the speed at which the 17 rotor is moving, rotating, feeds it back to the 18 controller. There is, as I mentioned, a specific 19 RPM required for generators that are going to be 20 connected to, for instance, power grids. That 21 feedback is given to the controller. The controller 22 compares it to where it needs to be, and then</p>	<p style="text-align: right;">Page 28</p> <p>1 increases or decreases the engine output to match 2 the load. 3 Q. When you say increases or decreases the 4 engine's output, what do you mean by "engine 5 output"? 6 A. The power that the engine is generating. 7 Q. Does it change the engine speed? 8 A. Yes. 9 Q. Does it change the engine torque? 10 A. Yes. 11 Q. When did this occur? When were you -- when 12 were you working on these machines? 13 A. I'll have to try and remember, but probably 14 around 7, 8 years ago or somewhere in that time 15 frame. I would say less than 10 years ago. 16 Q. So before 2015? 17 A. Yes. 18 Q. Were those conventional powertrains at that 19 time? 20 MR. ARGENTI: Objection. Form. 21 THE WITNESS: I don't understand how you 22 are defining "conventional powertrain."</p>

<p style="text-align: right;">Page 29</p> <p>1 Q. (By Mr. Sekyi) Well, they were known 2 before 2015; is that correct? 3 MR. ARGENTI: Objection. Form. 4 Q. (By Mr. Sekyi) Let me rephrase that 5 question. 6 Those machines existed before 2015; is that 7 correct? 8 A. Those types of machines, yes. 9 Q. Did those type of machines exist before, 10 let's say, 2010? 11 A. I would think so. 12 Q. Now, you have been asked to provide expert 13 opinions about the patentability of the '538 patent; 14 correct? 15 A. That is my understanding. 16 Q. Sorry. 17 To be more exact, about the patentability 18 of the claims of the '538 patent; correct? 19 A. That is my understanding, generally. 20 Q. And your opinions about the patentability 21 of the claims of the '538 patent are in view of the 22 two grounds of patentability asserted in the IPR</p>	<p style="text-align: right;">Page 30</p> <p>1 petition and in Dr. Stein's declaration; is that 2 correct? 3 A. Yes, that is what is stated on -- in my 4 declaration on Page 3. 5 Q. And one grounds of invalidity is the 6 obviousness of the '538 patent claims, Claims 1 to 7 13, in view of a reference called Willis and another 8 reference called Xing; is that correct? 9 A. That is what is stated in my declaration. 10 Q. And in your opinion, Willis and Xing fail 11 to disclose limitations of Claims 1 to 13; right? 12 A. As I state in my declaration, it is my 13 opinion that Willis and Xing fail to disclose each 14 and every limitation of Claims 1 to 13. 15 Q. So in Paragraph 16 of your declaration, 16 you reviewed the -- the legal standards of the 17 obviousness inquiry. 18 Do you see that? 19 A. I discuss the obviousness in Paragraph 16. 20 Q. And the standards you describe in Paragraph 21 16 -- sorry. Let me rephrase that. 22 Did your analysis of the validity of the</p>
<p style="text-align: right;">Page 31</p> <p>1 claims of the '538 patent use the standards laid 2 out -- you laid out in Paragraph 16? 3 A. As I've stated before, I have applied the 4 legal standards that are discussed in Section 3, 5 Pages 4, 5, 6 in my declaration, and Paragraph 16 is 6 included in that. 7 Q. So you'd inquired into the level of 8 ordinary skill in the art; is that correct? 9 MR. ARGENTI: Objection. Form. 10 THE WITNESS: I looked into whether or not 11 it would have been obvious, the claims, and that 12 does include looking at the level of ordinary skill 13 in the field. 14 Q. (By Mr. Sekyi) It also includes the scope 15 and content of the prior art; correct? 16 A. It does include the scope and content of 17 the prior art. 18 Q. It also includes what difference, if any, 19 existed between the claims and invention of the 20 prior art; is that correct? 21 A. What difference, if any, existed between 22 the claimed invention and the prior art.</p>	<p style="text-align: right;">Page 32</p> <p>1 Q. So in assessing what difference, if any, 2 existed between the claimed invention and the prior 3 art, you interpreted the meaning of the claims; is 4 that correct? 5 MR. ARGENTI: Objection. Form. 6 THE WITNESS: I state how I looked at the 7 claims in my declaration. Let me find you. 8 Q. (By Mr. Sekyi) You don't need to find me. 9 A. The part of my testimony that -- where I 10 state -- 11 Q. Oh. Sorry. Go ahead. 12 A. So when you said you interpreted, that was 13 your question -- could you please rephrase the 14 question or restate the question. 15 Q. So in assessing what difference, if any, 16 existed between the claimed invention and the prior 17 art, you interpreted the meaning of the claims; is 18 that correct? 19 MR. ARGENTI: Objection. Form. 20 THE WITNESS: I looked at the claim terms 21 of the '538 patent, and I was -- I gave them their 22 plain and ordinary meaning; that is, the meaning</p>

<p style="text-align: right;">Page 33</p> <p>1 that the terms would have had to the skilled artisan 2 at the time of the invention. And the relevant time 3 frame, as I mentioned, was made 2015. 4 Q. (By Mr. Sekyi) In Paragraphs 36 and 37 5 under the heading "Claim Construction," you describe 6 how you went about interpreting the claims; is that 7 correct? 8 A. I discuss in Paragraph 36 and 37 the 9 principles that I followed in my analysis throughout 10 my declaration. 11 Q. You state, in Paragraph 36, that you have 12 been -- "I have been advised that the claim terms of 13 the '538 patent are to be given their plain and 14 ordinary meaning, i.e., the meaning that the terms 15 would have had to a skilled artisan at the time of 16 the invention." 17 Did you have any other guidance about how 18 to interpret the claims beyond that? 19 A. The other guidance is also listed in -- my 20 understanding is listed also in Paragraph 37 where I 21 state that "The analysis focuses on intrinsic 22 evidence, including how the claim term is used in</p>	<p style="text-align: right;">Page 34</p> <p>1 the claims, specification, and prosecution history. 2 I also understand that dictionaries or other 3 extrinsic sources may assist in determining the 4 plain and ordinary meaning but cannot override a 5 meaning that is unambiguous from the intrinsic 6 evidence." 7 Q. So if I understand correctly, you gave -- 8 you interpreted the claim terms based on what a 9 person of ordinary skill in the art would have 10 understood after reading the specification of the 11 patent; correct? 12 A. I think I answered that question; that I 13 looked at the claim terms of the '538 patent and 14 gave them their plain and ordinary meaning; that is, 15 the meaning that the terms would have had to the 16 skilled artisan at the time of the invention. 17 Q. And there were no other restrictions to 18 that; correct? 19 MR. ARGENTI: Objection. Form. 20 THE WITNESS: Well, the additional 21 information is also listed in Paragraph 37, which I 22 already also stated. So that is basically the --</p>
<p style="text-align: right;">Page 35</p> <p>1 those include the principles that I followed through 2 my analysis in this declaration. 3 Q. (By Mr. Sekyi) So you actually listed the 4 claims at Paragraph 31 and 32 of your declaration; 5 right? 6 A. I listed Claim 1 and Claim 6. 7 Q. Those are the two independent claims in the 8 '538 patent; is that correct? 9 A. That is what I understand. 10 Q. And so if I understand correctly, you read 11 through Claim 1, in fact the entire '538 patent and 12 all the intrinsic evidence, and came to some 13 understanding of what the words of claims meant; is 14 that correct? 15 MR. ARGENTI: Objection. Form. 16 THE WITNESS: I looked at the '538 patent, 17 as well as the other information that we discussed 18 earlier. 19 Q. (By Mr. Sekyi) So the claim starts -- 20 Claim 1 starts off, "A controller implemented method 21 of controlling a machine having a rotor coupled to 22 an engine through a variable transmission."</p>	<p style="text-align: right;">Page 36</p> <p>1 Do you see that? 2 A. Yes, I see that. 3 Q. Is that a limitation of the claim? 4 MR. ARGENTI: Objection. Form. Scope. 5 THE WITNESS: It is listed in the Claim 1. 6 It is part of the citation of Claim 1. 7 Q. (By Mr. Sekyi) So when you were assessing 8 whether the prior art that Dr. Stein submitted 9 rendered the claims obvious, were you looking for 10 whether the prior art met that limitation? 11 A. So I looked at the entirety of Claim 1 and 12 looked at whether or not the prior art described 13 that whole claim, and I -- as I discussed in my 14 declaration, it is my opinion that the prior art 15 failed to disclose each and every limitation of 16 Claims 1 through -- Claim 1 through 13, which 17 includes Claim 1. 18 Q. And includes the -- the passage I just 19 recited; correct? 20 A. The passage you just recited is part of 21 Claim 1. 22 Q. So the prior art had to meet all those</p>

<p style="text-align: right;">Page 37</p> <p>1 limitations?</p> <p>2 MR. ARGENTI: Objection. Form.</p> <p>3 THE WITNESS: The prior art, it is my</p> <p>4 understanding, needs to meet Claim 1 in its</p> <p>5 entirety, and that includes all the other -- it --</p> <p>6 it includes meeting each and every part of -- of</p> <p>7 Claim 1 collectively.</p> <p>8 Q. (By Mr. Sekyi) Dr. Kemal, do you see the</p> <p>9 word "comprising" in Claim 1?</p> <p>10 A. Yes, I do.</p> <p>11 Q. What does that word mean in the context of</p> <p>12 this claim?</p> <p>13 MR. ARGENTI: Objection. Form. Scope.</p> <p>14 THE WITNESS: I think it's rather</p> <p>15 straightforward. It is listed in the claim, and it</p> <p>16 is -- it's got a regular and ordinary meaning.</p> <p>17 Q. (By Mr. Sekyi) Which is?</p> <p>18 A. That a controller implemented method of</p> <p>19 controlling a machine having a rotor coupled to an</p> <p>20 engine through a variable transmission comprising a</p> <p>21 number of things that are listed later in the</p> <p>22 Claim 1.</p>	<p style="text-align: right;">Page 38</p> <p>1 Q. So do you mean "including"?</p> <p>2 MR. ARGENTI: Objection. Form.</p> <p>3 THE WITNESS: I -- I think "comprising"</p> <p>4 is -- is the appropriate word here.</p> <p>5 Q. (By Mr. Sekyi) So "including" is not?</p> <p>6 MR. ARGENTI: Objection. Form.</p> <p>7 THE WITNESS: I would use the word</p> <p>8 "comprising."</p> <p>9 Q. (By Mr. Sekyi) I'm not asking about the</p> <p>10 word that you would use. I'm asking what that word</p> <p>11 means. I understand you've done -- you've</p> <p>12 interpreted all the words of this claim; correct?</p> <p>13 MR. ARGENTI: Objection. Form.</p> <p>14 THE WITNESS: I think I answered that</p> <p>15 question earlier.</p> <p>16 Q. (By Mr. Sekyi) I think you didn't.</p> <p>17 My question is --</p> <p>18 A. You were talking about interpreting the</p> <p>19 claim question, which was earlier; the question</p> <p>20 about interpreting the claims that we discussed</p> <p>21 earlier.</p> <p>22 Q. But my question now is: What does</p>
<p style="text-align: right;">Page 39</p> <p>1 "comprising" mean, that word?</p> <p>2 MR. ARGENTI: Objection. Form. Scope.</p> <p>3 THE WITNESS: "Comprising," to me, means it</p> <p>4 comprises of things. It is made of, comprises of;</p> <p>5 that is how I would normally interpret that word.</p> <p>6 Q. (By Mr. Sekyi) And it comprises of. Can</p> <p>7 it include other things beyond those listed?</p> <p>8 A. Claim 1 doesn't restrict -- doesn't say</p> <p>9 that other things cannot be included.</p> <p>10 Q. Okay.</p> <p>11 So after "comprising," Claim 1 goes on with</p> <p>12 four elements. The first starts with "receiving a</p> <p>13 desired rotor speed."</p> <p>14 Do you see that?</p> <p>15 A. Yes.</p> <p>16 Q. What receives the rotor speed?</p> <p>17 MR. ARGENTI: Objection. Form.</p> <p>18 THE WITNESS: The -- the claim, as it's</p> <p>19 stated, says -- I think it's relatively obvious -- a</p> <p>20 controller implemented method of controlling a</p> <p>21 machine having a rotor coupled to an engine through</p> <p>22 a variable transmission comprising, receiving a</p>	<p style="text-align: right;">Page 40</p> <p>1 desired rotor speed.</p> <p>2 Q. (By Mr. Sekyi) So my question to you is:</p> <p>3 What receives?</p> <p>4 MR. ARGENTI: Objection. Form. Scope.</p> <p>5 THE WITNESS: This is a method. So, in</p> <p>6 general, I think the -- I can say the method is</p> <p>7 receiving. It is the controller, the algorithm.</p> <p>8 There are multiple manifestations of it.</p> <p>9 Q. (By Mr. Sekyi) So the algorithm can</p> <p>10 receive?</p> <p>11 MR. ARGENTI: Objection. Form. Scope.</p> <p>12 THE WITNESS: I think I just answered that</p> <p>13 question.</p> <p>14 Q. (By Mr. Sekyi) Well, you said that</p> <p>15 multiple manifestations of something that can</p> <p>16 receive; correct?</p> <p>17 A. So the algorithm, and we discussed that in</p> <p>18 the -- in the declaration, I talked about that,</p> <p>19 which is on Page 20, Figure 5 of the '538 patent.</p> <p>20 Q. What page of your declaration are you</p> <p>21 looking at?</p> <p>22 A. Page 20.</p>

<p style="text-align: right;">Page 41</p> <p>1 Q. 20.</p> <p>2 A. I mean, that describes all the steps of</p> <p>3 the -- broadly, the flow part of the algorithm, and</p> <p>4 it does receive the desired rotor speed, as you can</p> <p>5 see in Figure 5.</p> <p>6 Q. So Figure 5 is a flow chart; correct?</p> <p>7 A. Figure 5 is a flow diagram of the various</p> <p>8 steps.</p> <p>9 Q. And that step is -- and those various</p> <p>10 steps -- I guess I don't quite understand.</p> <p>11 How does a step receive something?</p> <p>12 A. In general, what we're talking about is a</p> <p>13 controller. The controller has hardware and</p> <p>14 software that runs an algorithm. The steps are the</p> <p>15 various flow -- are part of the flow diagram, and</p> <p>16 the controller is receiving the information, and</p> <p>17 it's taking an action to achieve the desired goal.</p> <p>18 Q. So in the next step, when it says,</p> <p>19 "determining an engine load of the engine," what is</p> <p>20 doing that determining?</p> <p>21 A. Pardon?</p> <p>22 Q. In the next step of Claim 1 where it says,</p>	<p style="text-align: right;">Page 42</p> <p>1 "determining an engine load of the engine," what is</p> <p>2 doing the determining?</p> <p>3 A. So I think I discuss that in my</p> <p>4 declaration.</p> <p>5 Q. Can you point to where.</p> <p>6 A. So I state in my declaration in Paragraph</p> <p>7 26, "During operation, the '538 patent teaches that</p> <p>8 the control system, 128, via a controller, 130, is</p> <p>9 configured to receive a desired speed at which to</p> <p>10 operate the rotor, 118. The controller, 130,</p> <p>11 monitors or determines the current engine speed and</p> <p>12 current engine load of the milling machine, 100,</p> <p>13 such as via a sensor, 134, located at the engine</p> <p>14 output, 136."</p> <p>15 (Stenographer clarification.)</p> <p>16 Q. (By Mr. Sekyi) So in Claim 1, if I</p> <p>17 understand correctly from what you just read, the</p> <p>18 controller does the determining; correct?</p> <p>19 MR. ARGENTI: Objection. Form. Scope.</p> <p>20 Q. (By Mr. Sekyi) In Claim 1.</p> <p>21 A. Can you please remind me what</p> <p>22 determining -- what were we talking about when we</p>
<p style="text-align: right;">Page 43</p> <p>1 used the word "determine."</p> <p>2 Q. My question was: In the next step of</p> <p>3 Claim 1, where it says, "determining the engine load</p> <p>4 of the engine," what is doing the determining?</p> <p>5 MR. ARGENTI: Objection. Form. Scope.</p> <p>6 THE WITNESS: As I state in my declaration,</p> <p>7 Paragraph 27, "Once a control system, 128,</p> <p>8 determines the current engine load on the engine,</p> <p>9 the controller, 130, then retrieves, recalls, and/or</p> <p>10 refers to predefined fuel efficiency points."</p> <p>11 Q. (By Mr. Sekyi) And in the next element of</p> <p>12 Claim 1, "Adjusting an engine speed of the engine</p> <p>13 based on the engine load and one or more predefined</p> <p>14 efficiency points, at least partially based on</p> <p>15 predetermined fuel consumption rates and providing</p> <p>16 optimum engine speeds for different engine loads."</p> <p>17 What does the adjusting?</p> <p>18 MR. ARGENTI: Objection. Form. Scope.</p> <p>19 THE WITNESS: So as I testified in my</p> <p>20 declaration on Page 11, "The actual engine speed is</p> <p>21 not at the optimum engine speed as derived from the</p> <p>22 predefined fuel efficiency points, 162. The</p>	<p style="text-align: right;">Page 44</p> <p>1 controller, 130, then increases or decreases the</p> <p>2 engine speed until the optimum engine speed is</p> <p>3 substantially achieved."</p> <p>4 MR. SEKYI: I think we can go for a break.</p> <p>5 MR. ARGENTI: Okay.</p> <p>6 THE STENOGRAPHER: We're off the record.</p> <p>7 The time is 10:25 a.m.</p> <p>8 (Recess from 10:25 a.m. to 10:35 a.m.)</p> <p>9 THE STENOGRAPHER: We're back on the</p> <p>10 record. The time is 10:35 a.m.</p> <p>11 Q. (By Mr. Sekyi) Dr. Kemal, turning to</p> <p>12 Paragraph 13 -- 23 of your declaration, you state</p> <p>13 that "The '538 patent thus describes and claims</p> <p>14 specific control methods and systems for controlling</p> <p>15 a rotor coupled to an engine through a variable</p> <p>16 transmission in a fuel efficient manner."</p> <p>17 Do you see that?</p> <p>18 A. Yes, I do.</p> <p>19 Q. And you cite, I believe, various portions</p> <p>20 of the -- of the '538 patent; correct?</p> <p>21 A. That is what it appears.</p> <p>22 Q. But none of those cites that you point to</p>

<p style="text-align: right;">Page 45</p> <p>1 are cites to the claims; correct?</p> <p>2 A. So I don't have the '538 patent for me to</p> <p>3 verify.</p> <p>4 Q. Dr. Kemal, I'd like to hand you what's</p> <p>5 already been marked Exhibit 1001, which I believe is</p> <p>6 the copy of the '538 patent.</p> <p>7 Do you recognize Exhibit 1001?</p> <p>8 A. Yes, I do.</p> <p>9 Q. Okay.</p> <p>10 A. In that particular sentence, the reference</p> <p>11 that I cited do not include the claims.</p> <p>12 Q. So what is your basis for the statement</p> <p>13 that "The '538 patent thus describes and claims</p> <p>14 specific control methods"?</p> <p>15 A. The basis of that is described in my</p> <p>16 declaration in previous paragraphs, which include</p> <p>17 Paragraph 21, which states that "The '538 patent is</p> <p>18 entitled milling machine fuel efficiency control</p> <p>19 system. The patent is generally directed to road</p> <p>20 milling machines and to methods and systems for</p> <p>21 controlling the rotor speeds of cold planers and</p> <p>22 rotary mixers with optimized performance and fuel</p>	<p style="text-align: right;">Page 46</p> <p>1 efficiency."</p> <p>2 The basis also includes Paragraph 22, which</p> <p>3 states that "The '538 patent acknowledges that</p> <p>4 typically it may be desirable to maintain</p> <p>5 substantially constant rotor speed at the speed</p> <p>6 specified by the operator for at least a duration of</p> <p>7 a given milling task and/or until the operator</p> <p>8 chooses otherwise, but that changes in engine speed</p> <p>9 and engine load throughout the operation can cause</p> <p>10 unwanted variations in the rotor speed.</p> <p>11 "The '538 patent also explains that some</p> <p>12 milling machines provide variable transmissions</p> <p>13 which allow for variations in the engine speed</p> <p>14 without affecting rotor speed. But these</p> <p>15 conventional systems do not further address fuel</p> <p>16 efficiency, which is another concern that can be</p> <p>17 adversely affected by variations in engine speed and</p> <p>18 load."</p> <p>19 So then I summarize that "The '538 patent</p> <p>20 thus describes and claims specific control methods</p> <p>21 and systems for controlling a rotor coupled to an</p> <p>22 engine through a variable transmission in a fuel</p>
<p style="text-align: right;">Page 47</p> <p>1 efficient manner."</p> <p>2 And I also list some references from the</p> <p>3 '538 patent.</p> <p>4 Q. And those portions from Paragraph 21, 22,</p> <p>5 and 23 that you read, in your opinion, support your</p> <p>6 opinions about what the '538 patent claims; is that</p> <p>7 correct?</p> <p>8 A. These are part of the things that I've</p> <p>9 considered in formulating my opinions.</p> <p>10 Q. I'm not asking about what is -- let me</p> <p>11 rephrase that.</p> <p>12 What I'm asking about is your support for</p> <p>13 the -- what is claimed in the '538 patent that you</p> <p>14 mention in the first sentence of Paragraph 23. And</p> <p>15 you just read me the first -- Paragraph 21, 22, and</p> <p>16 portions of Paragraph 23 in support of that; is that</p> <p>17 correct?</p> <p>18 A. Yes.</p> <p>19 And in addition to the -- I mean, this is a</p> <p>20 summary of the -- what '538 is -- is claiming, but</p> <p>21 the specific claim language is in the '538 patent.</p> <p>22 Q. So in the next sentence of Paragraph 23, in</p>	<p style="text-align: right;">Page 48</p> <p>1 the second sentence, you state, "In particular, I</p> <p>2 describe more below" -- "as I describe more below,</p> <p>3 the claimed control methods and systems take into</p> <p>4 account a load on the engine during operation and</p> <p>5 use that engine load along with predetermined</p> <p>6 efficiency points to determine optimum engine speeds</p> <p>7 at which the engine may operate at the engine load</p> <p>8 to achieve enhanced fuel efficiency."</p> <p>9 Do you see that, Dr. Kemal?</p> <p>10 A. Yes. I think you read that correctly from</p> <p>11 my declaration.</p> <p>12 Q. Okay.</p> <p>13 Please point me where in Claim 1 is that</p> <p>14 limitation?</p> <p>15 A. So as I just discussed in -- a little bit</p> <p>16 ago, the Section 4 is the overview of the '538</p> <p>17 patent, and it is an attempt to describe the patent,</p> <p>18 but the explicit claim language is in the claims --</p> <p>19 within the patent itself, and which I recite later</p> <p>20 in Paragraph 31 and 32.</p> <p>21 Q. But you state that the claimed control --</p> <p>22 you state in the second sentence of Paragraph 23</p>

12 (Pages 45 to 48)

<p style="text-align: right;">Page 49</p> <p>1 that "The claimed control methods and systems take 2 into account load on the engine during operation and 3 use that load along with predetermined efficiency 4 points to determine the optimum engine speed at 5 which the engine may be" -- "may operate at that 6 engine load" -- "at the engine load." 7 My question to you is: Where is that 8 limitation -- where is that the engine operates -- 9 sorry. I messed that up. 10 Where do the claims require that the 11 control methods and system take into account a load 12 during engine operation and determines optimum 13 engine speeds at which the engine may operate at 14 that load? Where is that in the claims? 15 A. So if you look at Claim 1, you see it 16 states "determining an engine load of the engine" 17 and then continues on to say "adjusting an engine's 18 speed of the engine based on the engine load and one 19 or more predefined efficiency points, at least 20 partially based on predetermined fuel consumption 21 rates and providing optimum engine speeds for 22 different engine loads."</p>	<p style="text-align: right;">Page 50</p> <p>1 Q. Okay. 2 In the determining step in Claim 1, Claim 1 3 recites "determining an engine load of the engine"; 4 correct? 5 A. Claim 1 does recite "determining an engine 6 load of the engine." 7 Q. What does "determining an engine load of 8 the engine" require? 9 MR. ARGENTI: Objection. Form. 10 THE WITNESS: So I don't think I fully 11 understand that question. 12 Q. (By Mr. Sekyi) Well, I'm asking you what 13 the limitation, "determining an engine load of the 14 engine" means in Claim 1. Just that limitation, 15 what does that require? 16 MR. ARGENTI: Objection. Form. 17 THE WITNESS: Are you talking about what 18 that means or what that -- that require? I don't 19 understand. 20 Q. (By Mr. Sekyi) What that means; what 21 "determining an engine load of the engine" means. 22 MR. ARGENTI: Objection. Form.</p>
<p style="text-align: right;">Page 51</p> <p>1 THE WITNESS: I think we went over this a 2 little bit ago when I described the '538 patent, so 3 maybe I can do that again. 4 Q. (By Mr. Sekyi) Well, you've got a 5 statement in Paragraph 23 that "claim control method 6 and system involves determining an optimum engine 7 speed at which the engine may operate at the engine 8 load." 9 A. I'm sorry. Where are you reading? 10 Q. I'm reading from the first two lines on 11 Page 8. 12 A. Sorry. 13 And what's the question? 14 Q. Is there a requirement -- sorry. 15 Is "to determine optimum engine speeds at 16 which the engine may operate at the load" a 17 limitation of Claim 1? 18 A. I think we read the Claim 1 limitations; 19 and, again, it does state "adjusting an engine speed 20 of the engine based on the engine load and one or 21 more predefined efficiency points, at least 22 partially based on predetermined fuel consumption</p>	<p style="text-align: right;">Page 52</p> <p>1 rates and providing optimum engine speeds for 2 different engine loads." 3 Q. So, Dr. Kemal, are you saying that 4 "adjusting" is "determine"? 5 A. So in Claim 1, there is a statement, 6 "determining an engine load of the engine" prior to 7 what I just read, which is "adjusting an engine 8 speed of the engine based on the engine load." 9 Q. Right. 10 So my question relates to the step before 11 "adjusting." Before a machine in Claim 1 does any 12 adjusting, when it's just determining, what does 13 that determining step involve? 14 MR. ARGENTI: Objection. Form. 15 THE WITNESS: You're talking about to 16 determine optimum engine speed at which the engine 17 may operate at the engine load? Is that the 18 determining that you -- the determine that you are 19 asking about? 20 Q. (By Mr. Sekyi) Yes. I'm asking where is 21 that limitation in the claim? 22 A. So it does say, "based on predetermined</p>

<p style="text-align: right;">Page 53</p> <p>1 fuel consumption rates and providing optimum engine 2 speeds for different engine loads" in Claim 1 of the 3 '538 patent. 4 Q. But, Dr. Kemal, that is part of the 5 adjusting step; right? 6 A. There is a determination step within the 7 adjusting step, as you can read in the Claim 6 8 language. 9 Q. No. I'm talking about Claim 1 now. 10 A. Oh. Sorry. Claim 1 language. 11 Q. Okay. 12 Where in the -- you're saying -- sorry. 13 What is the determination step within the 14 adjusting step? 15 A. So, again, I'll just read. 16 "Adjusting an engine speed of the engine 17 based on the engine load and one or more predefined 18 efficiency points, at least partially based on 19 predetermined fuel consumption rates and providing 20 optimum engine speeds for different engine loads." 21 Q. So what is -- again, you've read me the 22 whole adjusting step. Are you saying the adjusting</p>	<p style="text-align: right;">Page 54</p> <p>1 step is determining? 2 A. There is partly a determine -- 3 predetermined fuel consumption rates are embedded in 4 that adjusting step. 5 Q. That's not -- so you're saying the 6 predetermined fuel step is part of -- predetermined 7 fuel consumption rates are part of determining the 8 engine load? 9 A. No. Determining the engine load is stated 10 prior to that -- 11 Q. Yes. 12 A. -- in Claim 1. 13 Q. Maybe I'm confused. 14 In Paragraph 23, you talk about 15 determining -- or to determine optimum engine speeds 16 at which the engine may operate at the engine load 17 to achieve enhanced fuel efficiency. 18 Do you see that in the first two lines of 19 Page 8? 20 A. Yes. 21 Q. And you say this is a claim limitation; is 22 that correct?</p>
<p style="text-align: right;">Page 55</p> <p>1 MR. ARGENTI: Objection. Form. 2 THE WITNESS: No. This is part of the -- 3 as I've stated earlier, an overview of the '538 4 patent. It's a description of the patent. It's not 5 talking about the claim limitations. The claim 6 limitations are stated in the claim. 7 Q. (By Mr. Sekyi) So then -- 8 A. And that is why I added them separately in 9 my declaration. 10 Q. So the last sentence, or the second line up 11 from the bottom of Page 7, where you say, "In 12 particular, as I describe more below, the claim 13 control methods" and you carry on. Those are not 14 the claim control methods; correct? 15 A. The claims, as I stated again, and I've 16 testified, I think, now multiple times, are listed 17 in the patent as is. The Section 4 is my overview 18 of the '538 patent. It's more of an explanation. 19 Q. So when you say "the claim control 20 methods," you're not describing the claim control 21 methods; correct? 22 A. I'm talking about, in general, the '538</p>	<p style="text-align: right;">Page 56</p> <p>1 patent, which does include claim control methods. 2 They're -- part of the claims include control 3 methods. 4 Q. Okay. 5 You're not asserting that they include 6 claim control methods. They include control methods 7 that determine optimum engine speed at which the 8 engine may operate at the engine load. That is not 9 part of the claim; correct? 10 A. The claim, as I stated, is listed in the 11 patent, and I think I've now stated that multiple 12 times, so I don't really understand your question. 13 Q. Well, you said that the claims include 14 something in Paragraph 23. I'm trying to understand 15 exactly what you think, in your opinion, they 16 contain. And there's a sentence here where it says, 17 "determine optimum engine speeds at which the engine 18 may operate at the engine load." 19 And I'm wondering, is it your opinion that 20 that limitation in there, that "the engine may 21 operate at the engine load" -- 22 A. I think --</p>

<p style="text-align: right;">Page 57</p> <p>1 Q. -- is determined engine load?</p> <p>2 A. I think I've answered that question.</p> <p>3 I think the Section 4 is an explanation of</p> <p>4 the method of the patent that includes the control</p> <p>5 methods that are in the claims.</p> <p>6 Q. Okay.</p> <p>7 So this is not a description of what is in</p> <p>8 the claim?</p> <p>9 MR. ARGENTI: Objection. Form.</p> <p>10 THE WITNESS: It is an overview of an</p> <p>11 explanation, but the actual claim is, as I stated,</p> <p>12 in the claim.</p> <p>13 Q. (By Mr. Sekyi) Okay.</p> <p>14 So is there a requirement -- sitting here</p> <p>15 right now, in your opinion, is there a requirement</p> <p>16 in the claim that the controller takes account of</p> <p>17 the load on the engine during operation and then the</p> <p>18 controller operate the engine at that load? Is</p> <p>19 there a requirement in the claim for that?</p> <p>20 MR. ARGENTI: Objection. Form.</p> <p>21 THE WITNESS: Can you please state that</p> <p>22 again. I didn't get the last part.</p>	<p style="text-align: right;">Page 58</p> <p>1 Q. (By Mr. Sekyi) I'm asking you: If, in the</p> <p>2 claims, there is a requirement that the controller</p> <p>3 is -- there a requirement that the engine is</p> <p>4 operated at the same load -- sorry. Strike that.</p> <p>5 Is there a requirement in the claim that</p> <p>6 the controller account for the load on the engine</p> <p>7 during operation and that it operates the engine at</p> <p>8 that load?</p> <p>9 MR. ARGENTI: Objection. Form.</p> <p>10 THE WITNESS: As I stated before, the claim</p> <p>11 includes determining an engine load of the engine</p> <p>12 and then adjusting an engine speed of the engine</p> <p>13 based on the engine load and one or more predefined</p> <p>14 efficiency points, at least partially based on</p> <p>15 predetermined fuel consumption rates and providing</p> <p>16 optimum engine speeds for different engine loads.</p> <p>17 Q. (By Mr. Sekyi) Is there a requirement in</p> <p>18 the claim that in the adjusting step in Claim 1,</p> <p>19 that the controller adjust the engine speed while</p> <p>20 the -- the engine continues to operate at the</p> <p>21 determined load?</p> <p>22 MR. ARGENTI: Objection. Form.</p>
<p style="text-align: right;">Page 59</p> <p>1 THE WITNESS: I just read you the claim</p> <p>2 limitations.</p> <p>3 Q. (By Mr. Sekyi) So that's not in the claim;</p> <p>4 correct?</p> <p>5 A. What you stated is not in the claim.</p> <p>6 Q. Okay.</p> <p>7 A. As in Claim Language 1, it is not stated in</p> <p>8 that particular --</p> <p>9 Q. And you don't interpret the claims to</p> <p>10 include that; correct?</p> <p>11 MR. ARGENTI: Objection. Form.</p> <p>12 THE WITNESS: Pardon? I didn't get that.</p> <p>13 Q. (By Mr. Sekyi) You do not interpret the</p> <p>14 claims to include that limitation?</p> <p>15 MR. ARGENTI: Objection. Form.</p> <p>16 THE WITNESS: I think I've answered the</p> <p>17 question. The claim language is there, and it is</p> <p>18 obvious to a person of -- of ordinary -- to a</p> <p>19 POSITA, it would be obvious.</p> <p>20 Q. (By Mr. Sekyi) Now, is there any</p> <p>21 requirement in the claim, Claim 1, that the</p> <p>22 controller adjust the speed of the engine to the</p>	<p style="text-align: right;">Page 60</p> <p>1 most fuel efficient -- to the optimum engine speed</p> <p>2 for fuel efficiency?</p> <p>3 MR. ARGENTI: Objection. Form.</p> <p>4 THE WITNESS: The limitations in the</p> <p>5 Claim 1 is listed in the claim language, and I think</p> <p>6 it is obvious to a POSITA as to what it means.</p> <p>7 So I don't understand, really, your</p> <p>8 question.</p> <p>9 Q. (By Mr. Sekyi) Dr. Kemal, I'm not</p> <p>10 interested -- well, I am interested, but I'm more</p> <p>11 interested in your opinion, not what a person of</p> <p>12 ordinary skill in the art would have understood.</p> <p>13 I'm asking you to tell me what you think a person of</p> <p>14 ordinary skill would understand.</p> <p>15 My question is: When, in Claim 1 --</p> <p>16 Claim 1 requires adjusting an engine speed -- does</p> <p>17 it require adjusting an engine speed to achieve the</p> <p>18 optimum engine speeds for fuel efficiency?</p> <p>19 MR. ARGENTI: Objection. Form.</p> <p>20 THE WITNESS: My opinion of what the -- the</p> <p>21 '538 patent generally describes is listed in</p> <p>22 Section 4, which is the overview of the '538 patent.</p>

<p style="text-align: right;">Page 61</p> <p>1 And I -- let me go to the section that</p> <p>2 talks about it. So it does say, "Once the control</p> <p>3 system, 128, determines the current engine load of</p> <p>4 the engine, the controller, 130, then retrieves,</p> <p>5 recalls, and refers to the predefined fuel</p> <p>6 efficiency points, 162, or any other predetermined</p> <p>7 information pertaining to fuel consumption</p> <p>8 characteristics of the milling machine, 100, stored</p> <p>9 in memory, 132, to determine an optimum engine speed</p> <p>10 for the given engine load."</p> <p>11 Q. (By Mr. Sekyi) Okay.</p> <p>12 A. And this is best illustrated -- the</p> <p>13 reference to identifying an optimum engine speed for</p> <p>14 the determined load as recited in the claims is best</p> <p>15 illustrated in table shown in Figure 4 that I</p> <p>16 reproduced in my declaration.</p> <p>17 Q. So, Dr. Kemal, in Paragraph 16, you state</p> <p>18 that "a determination of obviousness requires</p> <p>19 inquiries into various steps"; correct?</p> <p>20 A. Yes.</p> <p>21 Q. And one of those steps is an inquiry into</p> <p>22 what difference, if any, existed between the claimed</p>	<p style="text-align: right;">Page 62</p> <p>1 invention and the prior art; correct?</p> <p>2 A. That is correct.</p> <p>3 Q. It is -- the inquiry is not what difference</p> <p>4 existed between the patent and the prior art but the</p> <p>5 claimed invention.</p> <p>6 Do you see that?</p> <p>7 A. Yes, I do.</p> <p>8 Q. Okay.</p> <p>9 So my question to you is not about the '538</p> <p>10 patent or what it describes in general. My question</p> <p>11 to you is about this analysis you are required to</p> <p>12 have done between the claim and the prior art.</p> <p>13 Do you understand that?</p> <p>14 MR. ARGENTI: Objection. Form.</p> <p>15 THE WITNESS: Yes.</p> <p>16 Q. (By Mr. Sekyi) So did you compare the</p> <p>17 claims of the '538 patent with the prior art?</p> <p>18 A. Yes, I did.</p> <p>19 Q. Okay.</p> <p>20 Did you interpret the claims before you</p> <p>21 compared them to the prior art?</p> <p>22 A. And I guess I don't understand the -- how</p>
<p style="text-align: right;">Page 63</p> <p>1 are you defining the word "interpret." I read the</p> <p>2 claim. I understood those claims as a POSITA would</p> <p>3 have, and I compared it to the prior art.</p> <p>4 Q. So you understood the claims not as you</p> <p>5 would sitting here today, but as a POSITA would have</p> <p>6 understood back in May 2015; correct?</p> <p>7 A. Yes.</p> <p>8 MR. ARGENTI: Objection. Form.</p> <p>9 Q. (By Mr. Sekyi) And I'm understanding what</p> <p>10 you understood the claim to include or require based</p> <p>11 on your understanding of the claim.</p> <p>12 Do you understand that?</p> <p>13 MR. ARGENTI: Objection. Form.</p> <p>14 THE WITNESS: My understanding is that</p> <p>15 compared to the prior art, which included Xing, Xing</p> <p>16 fails to adjust the engine speed based on the engine</p> <p>17 load, which is included in the claims of the '538</p> <p>18 patent.</p> <p>19 I also understood that it fails to adjust</p> <p>20 an engine speed based on predefined efficiency</p> <p>21 points that provide optimum engine speeds for</p> <p>22 different engine loads.</p>	<p style="text-align: right;">Page 64</p> <p>1 Q. (By Mr. Sekyi) Did -- in your opinion,</p> <p>2 does the claim -- limitation of Claim 1 requiring</p> <p>3 adjusting an engine speed based on load require</p> <p>4 adjusting the engine speed while the operation</p> <p>5 continues to operate at the determined load?</p> <p>6 MR. ARGENTI: Objection. Form.</p> <p>7 THE WITNESS: "The determined load." Which</p> <p>8 load are we talking about?</p> <p>9 Q. (By Mr. Sekyi) In the previous step of the</p> <p>10 claim, there is a requirement that the controller</p> <p>11 determine an engine load of the engine.</p> <p>12 Do you recall that?</p> <p>13 A. Yes, I do.</p> <p>14 Q. And whatever that load is determined, is it</p> <p>15 your opinion that when the controller then adjusts</p> <p>16 the engine speed, the engine must continue to</p> <p>17 operate at that determined load?</p> <p>18 MR. ARGENTI: Objection. Form.</p> <p>19 THE WITNESS: It is my understanding that</p> <p>20 once the engine load of the engine is determined,</p> <p>21 the method will identify -- determine -- or sorry.</p> <p>22 Scratch that.</p>

<p style="text-align: right;">Page 65</p> <p>1 It is my understanding that once the engine 2 load of the engine is determined, the method would 3 retrieve, recall, and/or refer to predefined fuel 4 efficiency points, 162, to determine optimum engine 5 speed for the given load. 6 So until the load on the engine changes, 7 the idea would be to maintain the load. 8 Q. (By Mr. Sekyi) So once the engine -- the 9 engine load of the engine's determined, what in the 10 claim requires retrieving, recalling, or referring 11 to predefined fuel efficiency points? 12 MR. ARGENTI: Objection. Form. 13 THE WITNESS: The claims adjust -- once, in 14 the claims, the engine load of the engine is 15 determined, the method adjusts an engine speed of 16 the engine based on the engine load and one or more 17 predefined efficiency points, at least partially 18 based on predetermined fuel consumption rates. 19 Q. (By Mr. Sekyi) So how does adjusting the 20 engine speed involve retrieving predefined fuel 21 efficiency points? Is it because it is based on; is 22 that what you're saying?</p>	<p style="text-align: right;">Page 66</p> <p>1 A. It's partially -- at least partially based 2 on predetermined fuel consumption rates. 3 Q. Okay. 4 So you're saying that your understanding is 5 that a controller, in adjusting the engine speed 6 based on predefined efficiency points, is going to 7 retrieve those predefined efficiency points from 8 somewhere; memory or something? 9 A. As I stated in my declaration, that "once a 10 control system, 128, determines the current engine 11 load on the engine, the controller, 130, then 12 retrieves, recalls, and/or refers to predefined fuel 13 efficiency points, 162, or any other predetermined 14 information pertaining to the fuel consumption 15 characteristics of the milling machine, 100, stored 16 in memory, 132, to determine optimum engine speed 17 for the given engine load." 18 Q. So why does the act of retrieving 19 predefined efficiency points involve operating the 20 engine at the determined load? 21 MR. ARGENTI: Objection. Form. 22 THE WITNESS: Sorry. I did not understand</p>
<p style="text-align: right;">Page 67</p> <p>1 that question. 2 Q. (By Mr. Sekyi) Let me rephrase that. 3 The claim requires adjusting an engine 4 speed; correct? 5 A. Yes. 6 Q. And it requires adjusting the engine speed 7 based on the -- a load; correct? 8 A. As I think we've gone over the claim 9 language before, it determines an engine load of the 10 engine and then adjusts an engine speed of the 11 engine based on the engine load. 12 Q. Okay. 13 A. And one or more predefined efficiency 14 points. 15 Q. But the claim doesn't state adjusting the 16 engine speed to achieve the determined load; 17 correct? 18 A. It does talk about the fact that, you know, 19 the predefined efficiency -- so let me state it 20 again. 21 "Adjusting an engine speed of the engine 22 based on the engine load and one or more predefined</p>	<p style="text-align: right;">Page 68</p> <p>1 efficiency points, at least partially based on 2 predetermined fuel consumption rates and providing 3 optimum engine speeds for different engine loads." 4 Q. Okay. 5 So the phrase you pointed out stating, 6 "predefined efficiency points, at least partially 7 based on predetermined fuel consumption rates and 8 providing optimum engine speeds for different engine 9 loads." 10 The predetermined fuel consumption rates 11 and providing optimum engine speed for different 12 engine loads describes predetermined -- predefined 13 efficiency points; right? 14 A. Predetermined fuel consumption rates and 15 predefined efficiency points. 16 Q. They're explaining what predefined 17 efficiency points are; correct? 18 A. So, again, predefined efficiency points can 19 be at least partially based on the predetermined 20 fuel consumption rates. 21 Q. And also partially based on providing 22 optimum engine speeds for different engine loads;</p>

<p style="text-align: right;">Page 69</p> <p>1 correct?</p> <p>2 MR. ARGENTI: Objection. Form.</p> <p>3 THE WITNESS: So, again, it says,</p> <p>4 "Adjusting an engine speed of the engine based on</p> <p>5 the engine load and one or more predefined</p> <p>6 efficiency points, at least partially based on</p> <p>7 predetermined fuel consumption rates and providing</p> <p>8 optimum engine speeds for different engine loads."</p> <p>9 Q. (By Mr. Sekyi) So was I correct?</p> <p>10 A. No. I don't think you paraphrased it</p> <p>11 correctly.</p> <p>12 Q. I didn't paraphrase it.</p> <p>13 A. I didn't see that exact language -- or at</p> <p>14 least I didn't hear it. Maybe you can say that</p> <p>15 again.</p> <p>16 Q. Okay.</p> <p>17 So does the claim phrase, "at least</p> <p>18 partially based on" -- sorry. Let me start again.</p> <p>19 Does the claim phrase "at least partially</p> <p>20 based on predetermined fuel consumption rates and</p> <p>21 providing optimum engine speeds for different engine</p> <p>22 loads" describe predefined efficiency points?</p>	<p style="text-align: right;">Page 70</p> <p>1 A. The predefined efficiency points are stated</p> <p>2 just earlier, "one or more predefined efficiency</p> <p>3 points, at least partially based on predetermined</p> <p>4 fuel consumption rates and providing optimum engine</p> <p>5 speeds for different engine loads."</p> <p>6 Q. So it would be "providing optimum engine</p> <p>7 speeds for different engine loads" is just</p> <p>8 describing what the predefined efficiency points are</p> <p>9 at least partially based on; correct?</p> <p>10 MR. ARGENTI: Objection. Form.</p> <p>11 THE WITNESS: I think I describe it in the</p> <p>12 declaration with respect to Figure 4, that once a</p> <p>13 control, 128, determines -- sorry -- once a control</p> <p>14 system, 128, determines the current engine load on</p> <p>15 the engine, the controller then retrieves, recalls,</p> <p>16 and/or refers to predefined fuel efficiency point,</p> <p>17 162, which are shown in Figure 4, or any other</p> <p>18 predetermined information pertaining to fuel</p> <p>19 consumption characteristics of the milling machine,</p> <p>20 100, stored in memory, 132, to determine an optimum</p> <p>21 engine speed for that given engine load.</p> <p>22 And I've added an emphasis on that, "This</p>
<p style="text-align: right;">Page 71</p> <p>1 reference step to add and define optimum engine</p> <p>2 speed for the determined engine load, as recited in</p> <p>3 the claims of '538 patent is best illustrated in</p> <p>4 table shown in Figure 4," which I have reproduced</p> <p>5 and annotated below.</p> <p>6 So that's a description of the step of</p> <p>7 identifying an optimum engine speed for the</p> <p>8 determined engine load and obtaining predefined fuel</p> <p>9 efficiency points.</p> <p>10 Q. In your opinion, when the claim says "based</p> <p>11 on predefined efficiency points, at least partially</p> <p>12 based on predetermined fuel consumption rates and</p> <p>13 providing optimum engine speeds for different engine</p> <p>14 loads," it requires what you just read out for me in</p> <p>15 Paragraph 27; is that correct?</p> <p>16 A. That is a good illustration of the claim</p> <p>17 and -- and the method.</p> <p>18 Q. So that is what claim -- the claim -- the</p> <p>19 claim element I read to you requires; right?</p> <p>20 MR. ARGENTI: Objection. Form.</p> <p>21 THE WITNESS: The claim, as I say, is</p> <p>22 stated as-is. We've read that -- we've read that</p>	<p style="text-align: right;">Page 72</p> <p>1 now multiple times. What I described is a good</p> <p>2 illustration of the process.</p> <p>3 Q. (By Mr. Sekyi) What process?</p> <p>4 A. The process of once the engine load of the</p> <p>5 engine is determined, going from --</p> <p>6 Q. Sorry. Sorry.</p> <p>7 You mean after the determining step or as</p> <p>8 part of the determining step? That's what I don't</p> <p>9 quite understand.</p> <p>10 MR. ARGENTI: Objection. Form.</p> <p>11 THE WITNESS: If you look at the claim, the</p> <p>12 claim says, "Receiving a desired rotor speed</p> <p>13 determining an engine load of the engine," and then</p> <p>14 describes adjusting an engine speed of the engine</p> <p>15 based on engine load and one or more predefined</p> <p>16 efficiency points, at least partially based on</p> <p>17 predetermined fuel consumption rates and providing</p> <p>18 optimum speed for different engine loads."</p> <p>19 So the -- the illustration shows that there</p> <p>20 is a determined engine load.</p> <p>21 You go down -- you look at the blue arrow,</p> <p>22 you go down to predetermined fuel efficiency points,</p>

<p style="text-align: right;">Page 73</p> <p>1 which is shown in 162, and based on those, you go to</p> <p>2 the left to -- for to the optimum engine speeds.</p> <p>3 That's an illustration.</p> <p>4 Q. Yes. I'm not really looking for an</p> <p>5 illustration. I'm looking for what the claim means.</p> <p>6 A. So this would be what a POSITA would</p> <p>7 understand how the claim works.</p> <p>8 Q. So -- okay.</p> <p>9 So what you've just pointed out to me is</p> <p>10 what Claim 1 requires?</p> <p>11 MR. ARGENTI: Objection. Form. Scope.</p> <p>12 THE WITNESS: No. What I'm talking about</p> <p>13 is an illustration of how the claim would -- would</p> <p>14 be implemented as described in the '538 patent. And</p> <p>15 it is part of the -- so it is -- actually, I'll just</p> <p>16 stop there, yeah.</p> <p>17 Q. (By Mr. Sekyi) Okay.</p> <p>18 So my question was not asking for an</p> <p>19 illustration. I'm just asking for what the claim,</p> <p>20 you understood from the perspective of a person of</p> <p>21 ordinary skill in the art, means and all I want to</p> <p>22 know is: What is required in the claim --</p>	<p style="text-align: right;">Page 74</p> <p>1 MR. ARGENTI: Objection. Form.</p> <p>2 Q. (By Mr. Sekyi) -- not an illustration.</p> <p>3 MR. ARGENTI: Form.</p> <p>4 Q. (By Mr. Sekyi) Do you understand that?</p> <p>5 MR. ARGENTI: Objection. Form.</p> <p>6 THE WITNESS: Can -- can you please ask</p> <p>7 that question again. I think we've gone over this</p> <p>8 now many, many times.</p> <p>9 Q. (By Mr. Sekyi) Dr. Kemal, we have to go</p> <p>10 over it as many times as it takes.</p> <p>11 The question is: Does Claim 1 require --</p> <p>12 sorry. I'll strike that at this point.</p> <p>13 So, Dr. Kemal, let me ask you this.</p> <p>14 I may have asked it previously; I'm going</p> <p>15 to ask it again.</p> <p>16 When Claim 1 calls for adjusting an engine</p> <p>17 speed based on predefined efficiency points, does it</p> <p>18 require adjusting the engine speed to achieve the</p> <p>19 optimum engine speed for fuel efficiency --</p> <p>20 A. Sorry.</p> <p>21 Q. -- in your opinion?</p> <p>22 A. That is a long question. Can you restate</p>
<p style="text-align: right;">Page 75</p> <p>1 that, please.</p> <p>2 Q. Yeah.</p> <p>3 Does Claim 1 require adjusting the engine</p> <p>4 to the optimum speed for fuel efficiency as part of</p> <p>5 the adjusting step?</p> <p>6 A. Claim 1, adjust the engine speed of the</p> <p>7 engine based on the engine load and one or more</p> <p>8 predefined efficiency points, at least partially</p> <p>9 based on predetermined fuel consumption rates and</p> <p>10 provide optimum engine speeds for different engine</p> <p>11 loads.</p> <p>12 As I just explained above, the method --</p> <p>13 and this is stated in my declaration -- described in</p> <p>14 claim by the '538 patent starts with the</p> <p>15 determination of an engine load as a reference point</p> <p>16 from which predefined efficiency points are</p> <p>17 retrieved for that given load, which then provide</p> <p>18 optimum engine speeds at which to operate the engine</p> <p>19 at the determined engine load to achieve better fuel</p> <p>20 efficiency.</p> <p>21 And I -- again, as I mentioned, it is</p> <p>22 illustrated in Figure 5 of '538 patent where the</p>	<p style="text-align: right;">Page 76</p> <p>1 process starts with the determination of the engine</p> <p>2 load based on the desired rotor speed, Steps 164-1</p> <p>3 and 164-2. Then refers to fuel efficiency points,</p> <p>4 Step 164-3, that provide optimum engine speeds and</p> <p>5 then adjust the engine speed to the optimum engine</p> <p>6 speed for the engine loads, Steps 164-4 and 164-5,</p> <p>7 and this, I explain in my declaration, is different</p> <p>8 than what Xing describes.</p> <p>9 Q. So the answer to my last question was</p> <p>10 "yes"?</p> <p>11 MR. ARGENTI: Objection. Form.</p> <p>12 THE WITNESS: I think I answered that</p> <p>13 question.</p> <p>14 Q. (By Mr. Sekyi) So "yes"; correct?</p> <p>15 MR. ARGENTI: Objection. Form.</p> <p>16 THE WITNESS: I -- my answer is the one</p> <p>17 that I've given to you. That is my answer.</p> <p>18 Q. (By Mr. Sekyi) Okay.</p> <p>19 So my question was: Does Claim 1 require</p> <p>20 adjusting an engine to the optimum speed for fuel</p> <p>21 efficiency as part of the adjusting step? Yes or</p> <p>22 no?</p>

<p style="text-align: right;">Page 77</p> <p>1 MR. ARGENTI: Objection. Form.</p> <p>2 THE WITNESS: I think I answered that</p> <p>3 question, and the answer I explained is what the</p> <p>4 method described in and claimed by the '538 patent</p> <p>5 is -- is doing.</p> <p>6 Q. (By Mr. Sekyi) Okay.</p> <p>7 So now let's consider Xing a little.</p> <p>8 Now, Dr. Kemal, you agree that in the --</p> <p>9 that load -- engine load can be measured in terms of</p> <p>10 torque or can be measured in terms of power;</p> <p>11 correct?</p> <p>12 MR. ARGENTI: Objection. Form.</p> <p>13 THE WITNESS: I think I discuss that in my</p> <p>14 declaration, so let me find it.</p> <p>15 Q. (By Mr. Sekyi) Well, let me ask a</p> <p>16 different question.</p> <p>17 You agree that the term "load" can be</p> <p>18 measured in terms of torque; correct?</p> <p>19 A. That is correct.</p> <p>20 I -- let me give you -- yes.</p> <p>21 Sorry. I was still looking for the</p> <p>22 previous question.</p>	<p style="text-align: right;">Page 78</p> <p>1 Yeah, I agree that the plain and ordinary</p> <p>2 meaning of engine load is the total amount of torque</p> <p>3 required from engine to operate the machine at a</p> <p>4 given time.</p> <p>5 Q. And it can also be expressed in terms of</p> <p>6 power; correct?</p> <p>7 Sorry. Engine load can also be expressed</p> <p>8 in terms of engine power; right?</p> <p>9 A. If you multiply the engine torque with</p> <p>10 the -- the engine RPM, you will get engine power.</p> <p>11 And I understand that Dr. Stein contends that engine</p> <p>12 load can also be expressed in terms of power; that</p> <p>13 is, engine torque times engine speed produced at the</p> <p>14 output of the engine.</p> <p>15 Q. And in the '538 patent, the claimed engine</p> <p>16 load represents the total load on the engine.</p> <p>17 A. The claimed engine load that is determined</p> <p>18 by the '538 patent represents the total load on the</p> <p>19 engine which encompasses both the load required to</p> <p>20 do useful work and loads caused by system</p> <p>21 inefficiencies or losses.</p> <p>22 Q. Okay.</p>
<p style="text-align: right;">Page 79</p> <p>1 Now, Xing is directed to a method for</p> <p>2 reducing the fuel consumption of work vehicles;</p> <p>3 right?</p> <p>4 A. That is what I recall, but it would be good</p> <p>5 to have the Xing patent in front of me.</p> <p>6 Q. Let me hand you what's already been marked</p> <p>7 Wirtgen Exhibit 1006.</p> <p>8 So do you agree that Xing is directed to a</p> <p>9 system method for reducing the engine fuel</p> <p>10 consumption for work vehicles?</p> <p>11 A. Xing patent is titled "System and Method</p> <p>12 for Reducing Fuel Consumption of a Work Vehicle."</p> <p>13 Q. At least one embodiment describes a tractor</p> <p>14 with an engine connected to the tractor's wheels via</p> <p>15 a variable transmission; right?</p> <p>16 A. There is a description in Figure 1 of a</p> <p>17 tractor and in Figure 3 of an engine connected to</p> <p>18 the load via a transmission.</p> <p>19 Q. And that transmission is a variable</p> <p>20 transmission; correct?</p> <p>21 A. That is what I understand. It's a</p> <p>22 hydromechanical variable transmission.</p>	<p style="text-align: right;">Page 80</p> <p>1 Q. That hydromechanical transmission includes</p> <p>2 a hydrostatic unit; right? Item 30.</p> <p>3 A. Yes. Item 30 in Figure 2 does represent a</p> <p>4 hydrostatic unit.</p> <p>5 Q. Okay.</p> <p>6 That includes a pump, a hydraulic pump, on</p> <p>7 Number 36; right?</p> <p>8 A. That does include a hydraulic pump,</p> <p>9 Number 36.</p> <p>10 Q. And a hydraulic motor, Number 40?</p> <p>11 A. Yes. Number 40, from what I understand, is</p> <p>12 a hydraulic motor.</p> <p>13 Q. And the pump includes a swashplate, which I</p> <p>14 understand is indicated by 48; is that correct?</p> <p>15 A. That is what I understand by -- after</p> <p>16 reviewing the patent.</p> <p>17 Q. Have you worked on those kinds of</p> <p>18 hydrostatic units before, Dr. Kemal?</p> <p>19 A. I've worked on hydraulic systems which</p> <p>20 include hydraulic pumps and motors. I have not</p> <p>21 worked explicitly on a hydrostatic unit like this</p> <p>22 one.</p>

<p style="text-align: right;">Page 81</p> <p>1 Q. Okay.</p> <p>2 Have you worked on any hydrostatic units</p> <p>3 with swashplates on them?</p> <p>4 A. I've worked, as I mentioned, on hydraulic</p> <p>5 motors, but not ones with -- hydraulic pumps, but</p> <p>6 not ones with swashplates. But I understand what</p> <p>7 they are and how they work.</p> <p>8 Q. What is the function of the swashplate, as</p> <p>9 far as you understand?</p> <p>10 A. The swashplate, from what I understand, can</p> <p>11 be varied to increase or decrease the amount of</p> <p>12 power that is going through the hydraulic</p> <p>13 hydrostatic unit.</p> <p>14 Q. So by changing the angle of the swashplate,</p> <p>15 you change the amount of power going through the</p> <p>16 unit; is that correct?</p> <p>17 A. You can increase or reduce the amount of</p> <p>18 power going through the unit.</p> <p>19 Q. And so that can go from zero to max;</p> <p>20 correct?</p> <p>21 A. It is typically not zero. There is always</p> <p>22 some fuel flow that go through it, but it can be</p>	<p style="text-align: right;">Page 82</p> <p>1 reduced and increased.</p> <p>2 Q. To --</p> <p>3 A. So there is always some power going through</p> <p>4 the -- the hydrostatic unit.</p> <p>5 Q. Can these hydrostatic units operate in both</p> <p>6 forwards and reverse?</p> <p>7 MR. ARGENTI: Objection to form.</p> <p>8 THE WITNESS: That depends. The way that</p> <p>9 Xing's patent is described, the part of the</p> <p>10 transmission is only working in one direction.</p> <p>11 Q. (By Mr. Sekyi) Now -- now, Xing measures</p> <p>12 the power output of the engine; correct? P engine?</p> <p>13 A. Xing, in one of its methods, talks about</p> <p>14 determining the load power requirement to identify a</p> <p>15 set of candidate engine speeds for achieving the</p> <p>16 load power requirement and then determining power</p> <p>17 loss for each candidate speed.</p> <p>18 Q. Okay.</p> <p>19 Have you finished your answer?</p> <p>20 A. No, not yet.</p> <p>21 In another -- in another teaching, Xing</p> <p>22 also teaches that, alternately, the power load</p>
<p style="text-align: right;">Page 83</p> <p>1 requirement can -- may be determined directly by</p> <p>2 determining the output torque and output speed of</p> <p>3 the work vehicle, 10.</p> <p>4 Q. But that does not involve -- sorry. I'm a</p> <p>5 little confused. My question was really about when</p> <p>6 Xing measures P engine.</p> <p>7 A. Yes.</p> <p>8 What was the question again?</p> <p>9 Q. Question was: Now, Xing measures the power</p> <p>10 output of the engine; correct?</p> <p>11 A. In one -- in one teaching, Xing measures</p> <p>12 the power output of the engine; and in the other, it</p> <p>13 measures the load power requirement.</p> <p>14 Q. Now, Xing calculates the load power</p> <p>15 requirement also by subtracting the loss, the power</p> <p>16 loss, P loss, from the engine load, P engine;</p> <p>17 correct?</p> <p>18 A. So Xing begins in -- Xing begins with a</p> <p>19 determination of the load power requirement in Step</p> <p>20 202 in Figure 5 of the patent to identify a set of</p> <p>21 candidate or possible engine speeds for achieving</p> <p>22 the load power requirement, which is Step 204;</p>	<p style="text-align: right;">Page 84</p> <p>1 determining power loss for each candidate engine</p> <p>2 speed, which is Step 206; and then calculating a set</p> <p>3 of corresponding candidate or possible engine powers</p> <p>4 and torques in Step 208, which are then compared to</p> <p>5 efficiency values to find the candidate</p> <p>6 engine speed/torque pairs associated with the fuel</p> <p>7 consumption value, Step 210.</p> <p>8 So unlike the method claimed by the '538</p> <p>9 patent, Xing process moves from a determined load</p> <p>10 power requirement to identification of candidate</p> <p>11 engine speeds to estimation of power loss at each</p> <p>12 candidate engine speed to calculation of candidate</p> <p>13 engine power and/or torques, and then comparison of</p> <p>14 fuel consumption values to select an engine speed</p> <p>15 amongst the candidate speeds that is most fuel</p> <p>16 efficient.</p> <p>17 Q. Dr. Kemal, can you turn to Xing Column 9</p> <p>18 at -- at Column 9, Lines 53 to -- 52 to 56. Do you</p> <p>19 see where it says, "As such, by determining the</p> <p>20 current engine power and the current engine loss,</p> <p>21 the current engine power loss, the current power</p> <p>22 load requirement may be calculated using Equation</p>

<p style="text-align: right;">Page 85</p> <p>1 1"? 2 A. Yes, I see that. 3 Q. So do you agree that Xing discloses 4 calculating the P load from P engine; correct? 5 A. As I just described, Xing -- the Xing 6 patent starts with determination of the load power 7 requirement to identify candidate engine speed for 8 achieving a load power requirement. 9 And more specifically, after determining 10 the load power requirement, it comes up with 11 approved plurality -- sorry -- plurality of 12 candidate engine speeds based on the load power 13 requirement. 14 Q. Dr. Kemal, I'm asking you your 15 understanding of what I just read in Xing at Column 16 9, Lines 52 to 56. In your opinion, what do those 17 lines mean? 18 MR. ARGENTI: Objection. Form. 19 THE WITNESS: As I described in my 20 declaration -- and let me get to that, so give me a 21 minute. 22 So in Xing disclosure the --</p>	<p style="text-align: right;">Page 86</p> <p>1 (Stenographer clarification.) 2 THE WITNESS: -- load power requirement is 3 calculated indirectly rather than measured directly 4 in one teaching. This is performed through the 5 measurement of the current engine speed and current 6 engine torque at the engine output to calculate the 7 current engine power or load, P engine, which is the 8 product of the measured engine speed and the 9 measured engine torque. 10 The load power requirement, P load, is then 11 calculated first by estimating the current power 12 loss, P loss, and then subtracting the estimated 13 current power loss from the current engine power, 14 P engine. 15 Thus, and this is according to Dr. Stein, 16 to the extent Xing describes determining an engine 17 load, whether in terms of torque or power, it is 18 done for the purpose of calculating the load power 19 requirement. 20 Q. (By Mr. Sekyi) So to calculate P load, 21 Xing takes -- in one embodiment, takes P engine and 22 subtracts P loss; correct?</p>
<p style="text-align: right;">Page 87</p> <p>1 A. Computes -- measures P engine by measuring 2 engine torque and engine speed. And then for the 3 engine speed and other variables, including 4 temperature and forward velocity and loss of 5 pressure in the hydrostatic unit, estimates the 6 P loss and then calculates the load power 7 requirement based on those factors. 8 Q. And that's in -- you phrase that in 9 indirect measurement; correct? 10 A. For the load -- in this particular 11 teaching, it is an indirect measurement of the load 12 power requirement, which is -- which is the -- which 13 is what Xing is trying to control. 14 Q. So it's indirect. I want to understand 15 your use of the word "indirect." It's indirect 16 because rather than measuring P load directly, it's 17 calculated by measuring P engine and subtracting 18 P loss; correct? 19 A. That is correct. 20 And all -- I also talk about in -- in other 21 teaching in Stein -- in Xing, the load power 22 requirement is measured directly.</p>	<p style="text-align: right;">Page 88</p> <p>1 Xing also teaches that alternately, the 2 load power -- the power load requirement may be 3 determined directly by monitoring the output torque 4 and the output speed of the work vehicle. 5 Q. Sorry. Was there an outstanding question 6 about that? 7 A. Oh. I was just finishing my -- 8 Q. Oh. Sorry. 9 A. So I said that Xing also teaches that 10 the -- alternately, the load -- the power load 11 requirement may be determined directly by monitoring 12 the output torque and the output speed of the work 13 vehicle, 10. 14 MR. ARGENTI: We've been going about an 15 hour and a half, and it's just after noon. Is it 16 time for lunch? 17 MR. SEKYI: Yeah, let's take a break. 18 THE STENOGRAPHER: We're off the record. 19 The time is 12:03 p.m. 20 (Lunch recess from 12:03 p.m. to 1:20 p.m.) 21 THE STENOGRAPHER: We're back on the 22 record. The time is 1:20 p.m.</p>

<p style="text-align: right;">Page 89</p> <p>1 Q. (By Mr. Sekyi) Dr. Kemal, in Paragraph 46 2 of your report, you describe the method -- you 3 discuss the method described in the claim by the 4 '538 patent; correct? 5 A. Yes. 6 Q. And then in Paragraph -- the next 7 paragraph, Paragraph 47, you begin contrasting what 8 Xing described. 9 A. It's the start of the contrasting. 10 Q. And that goes on until, I believe -- the 11 contrasting goes on until something like page -- 12 Paragraph 55; right? 13 A. In general, yes, that appears to be 14 correct. 15 Q. And in Paragraph 46, is this supposed to be 16 a discussion of the claims? 17 MR. ARGENTI: Objection. Form. 18 THE WITNESS: As I explained earlier, this 19 is a description/explanation overview of the method 20 in the '538 patent. 21 Q. (By Mr. Sekyi) Okay. 22 So when you're contrasting, in Paragraph --</p>	<p style="text-align: right;">Page 90</p> <p>1 what Xing has in Paragraph 47 through 55, you're not 2 comparing Xing to the claim when you compare it to 3 Paragraph 46; correct? 4 A. As I say again, I am comparing Xing to 5 the -- to the claims in 5 -- in '538. Paragraph 46 6 is an overview or a broad description of the method. 7 Q. So can you parse out which bits of 8 Paragraph 46 are the claim and which are not -- of 9 the claim of the '538 and which are not? 10 MR. ARGENTI: Objection. Form. 11 THE WITNESS: Again, as I say, this is an 12 explanation. It is not meant to be an explicit 13 recitation of the claim in 46. 14 Q. (By Mr. Sekyi) In Paragraph 47, do you 15 discuss the '538 patent claims? 16 A. Yes, I do. 17 Q. Where is that? 18 A. I do discuss the '538 patent when I -- 19 in -- on Page 21, which I state that "unlike the 20 method claimed by '538 patent, Xing process moves 21 from a predetermined load power requirement to 22 identification of candidate engine speeds to</p>
<p style="text-align: right;">Page 91</p> <p>1 estimation of power loss at each candidate engine 2 speed to calculation of candidate engine power and 3 torques and then comparison of fuel consumption 4 values to select an engine speed amongst the 5 candidate speeds that are most fuel efficient." 6 Q. So -- 7 A. This shows that the Xing method is clearly 8 different than the method described in '538 patent. 9 Q. Is the portion you -- of Paragraph 47 you 10 just read out in your answer, are each of those 11 claim limitations in the '538 patent? 12 A. The claim limitations in the '538 patent we 13 have discussed before. They are stated and recited 14 in my declaration in 30 in -- the Claim 1 is in 15 Paragraph 31, and Claim 6 is in Paragraph 32. 16 Q. I'm not asking about where the claim is 17 in -- listed in your -- in your declaration. I'm 18 asking you what your comparison was, and I'm asking 19 you: Was your comparison a comparison of the claim 20 elements in the '538 patent to what was disclosed in 21 Xing? 22 A. When I did the comparison overall, I looked</p>	<p style="text-align: right;">Page 92</p> <p>1 at the claims of the '538 patent, and I -- and 2 compared -- understood how Xing -- what method Xing 3 was describing, and I'm describing -- this is my 4 description of the differences that I just stated. 5 Q. Okay. 6 How about in -- in Paragraph 58 of your 7 declaration, do you refer to any of the claim 8 limitations of the '538 patent in there? 9 A. In Paragraph 58, I discuss that a person of 10 ordinary skill in the art would have appreciated 11 that Xing's method -- that -- would have appreciated 12 the distinctions between the Xing and the '538 13 patent, in that the Xing's method does not adjust an 14 engine speed based on predefined efficiency points 15 that provide optimum speeds for different loads. 16 This is because Xing's method relies on 17 identification of a number of candidate 18 engine speed/torque pairings that will achieve a 19 given load power requirement. 20 Xing does not indicate that the candidate 21 speeds associated with each of these pairings 22 represent the optimum speed of the paired candidate</p>

<p style="text-align: right;">Page 93</p> <p>1 engine torque. Instead, Xing seeks to identify the 2 most efficient combination of candidate 3 engine speed/torque by comparing each of the 4 pairings to an associated efficiency value. This 5 means that Xing fails to disclose predefined 6 efficiency points, as claimed in the '538 patent 7 insofar as any efficiency points in Xing do not 8 provide optimum engine speeds for different engine 9 loads.</p> <p>10 Q. So that's in Paragraph 58; correct? 11 A. Yes. 12 Q. Okay. 13 So in your opinion, then, a machine that 14 generates pairs of speed/torque points that are 15 not -- that do not represent the optimum speed of 16 the engine for that load -- 17 A. I discuss that in my -- 18 Q. I haven't finished the question. 19 A. Oh. Sorry. 20 Q. Yeah. 21 -- is not within the scope of the claims; 22 is that correct?</p>	<p style="text-align: right;">Page 94</p> <p>1 A. Sorry. Say that again. 2 Q. Yeah. 3 So in your opinion, a machine that adjusts 4 speed, engine speed, based on engine speed/torque 5 pairs that do not, themselves, represent an optimum 6 engine speed are outside the scope of the claims; is 7 that correct? 8 MR. ARGENTI: Objection. Form. 9 THE WITNESS: If they fail to disclose the 10 predefined efficiency points -- or Xing's method 11 fails to define the predefined efficiency points, as 12 claimed in '538 patent, insofar as the efficiency 13 points in Xing do not provide optimum engine speeds 14 for different engine loads. So we're going -- we're 15 talking about the speed/torque pairings that will 16 achieve a given load power requirement. 17 Q. (By Mr. Sekyi) So when you say we are 18 talking about -- so we're talking about the 19 speed/torque pairings that will achieve a given load 20 power requirement, is that in '538 patent or in 21 Xing? I got confused. 22 A. In the '538 patent, the engine speed</p>
<p style="text-align: right;">Page 95</p> <p>1 adjustment is based on the engine load and one or 2 more predefined efficiency points, at least 3 partially based on predetermined fuel consumption 4 rates and provide optimum engine speeds for 5 different engine loads. 6 So the torque/speed pairings are discussed 7 in the Xing patent. 8 Q. In Paragraph 55, you say that "Xing seeks 9 to vary both the engine speed and the engine torque 10 to identify the target engine speed which further 11 illustrates that the selection of target engine 12 speed is made independent of any existing and 13 measured engine load"; correct? 14 A. Yes, I think you read that correctly. 15 Q. So in your opinion, varying both the engine 16 speed and engine torque to identify target candidate 17 engine speed illustrates that the selection of 18 target engine speed is independent of existing 19 measured engine load; is that correct? 20 A. As I stated in my declaration, in Xing's it 21 seeks to vary both engine speed and engine torque to 22 identify the target candidate engine speed, which,</p>	<p style="text-align: right;">Page 96</p> <p>1 itself, is paired with a candidate engine torque, 2 which further illustrates that the selection of the 3 target engine speed is made independent of any 4 existing and measured engine load; and, as a result, 5 Xing's adjustment of an engine speed is not based on 6 determined engine load as it's recited in the claims 7 of the '538 patent. 8 Q. Dr. Kemal, I'm trying to isolate what the 9 nub of your disagreement is in Paragraph 55. So I 10 can read the whole of Paragraph 55. I'm kind of 11 wondering about if parts of it are what you consider 12 to be outside the scope of the claim. 13 So do you understand the -- my question the 14 way that I was asking the question? 15 MR. ARGENTI: Objection. Form. 16 THE WITNESS: So in Paragraph 55, there is 17 discussion before this that feeds into the paragraph 18 which is in 55 that illustrates the nub of my 19 opinion related to how Xing and '538 patent are 20 different. 21 Q. (By Mr. Sekyi) And what is the nub of your 22 disagreement -- or, rather, the nub of your opinion</p>

<p style="text-align: right;">Page 97</p> <p>1 in Paragraph 54?</p> <p>2 A. "One of the main differences in Xing's</p> <p>3 process is that the ultimate speed adjustments are</p> <p>4 based on the load power requirement, which is the</p> <p>5 only constant, as it's shown in Xing's Figure 5.</p> <p>6 All other candidate variables and associated</p> <p>7 efficiency values are potential values that will</p> <p>8 vary, depending on which candidate engine speed is</p> <p>9 chosen.</p> <p>10 "In addition, as Xing discloses, the speed</p> <p>11 adjustments are not based on any measured load of</p> <p>12 the engine, whether in terms of the measured engine</p> <p>13 torque or power, because while" --</p> <p>14 (Stenographer clarification.)</p> <p>15 THE WITNESS: -- "engine power has a loss</p> <p>16 component that varies with engine speed, the</p> <p>17 ultimate value of concern is the load power</p> <p>18 requirement. As such, the engine speed adjustments</p> <p>19 of Xing are based on determining the load power</p> <p>20 requirement rather than the current engine load."</p> <p>21 And I continue to discuss this further, and</p> <p>22 we can talk about that.</p>	<p style="text-align: right;">Page 98</p> <p>1 Q. (By Mr. Sekyi) So my question was actually</p> <p>2 referring to -- you -- because you referred back to</p> <p>3 Paragraph 54, so I was saying what in Paragraph 54</p> <p>4 is the nub of your disagreement, and then you</p> <p>5 started answering.</p> <p>6 A. Yeah, I think I mentioned Paragraph 54 and</p> <p>7 before; so my discussion is in the paragraphs</p> <p>8 preceding Paragraph 55, including, you know, like</p> <p>9 Paragraph 54 and preceding paragraphs.</p> <p>10 Q. But you said the nub of your disagreement</p> <p>11 was in Paragraph 54?</p> <p>12 A. That's not what I meant to say.</p> <p>13 Q. Okay.</p> <p>14 So in Paragraph -- in Figure 5 at -- I</p> <p>15 guess at the top of Paragraph 50, Figure 5 from</p> <p>16 Xing, in the second column from the left is listed</p> <p>17 the forecasted load power requirement; correct?</p> <p>18 A. That is correct.</p> <p>19 Q. And that can also be the -- the load</p> <p>20 requirement that Xing is talking about.</p> <p>21 A. The load power requirement.</p> <p>22 Q. The load power requirement; right.</p>
<p style="text-align: right;">Page 99</p> <p>1 Is that correct?</p> <p>2 A. Yes. Yeah, yeah.</p> <p>3 Q. Okay.</p> <p>4 And that -- and each of those -- and there</p> <p>5 are three different rows represented in that table;</p> <p>6 correct?</p> <p>7 A. That is correct.</p> <p>8 Q. And they are --</p> <p>9 A. Well, there are four; three rows with data</p> <p>10 in them.</p> <p>11 Q. Okay.</p> <p>12 And each of those three rows of data have</p> <p>13 different correspondent candidate engine speeds;</p> <p>14 correct?</p> <p>15 A. Yes, that is correct.</p> <p>16 Q. Okay.</p> <p>17 And each of the forecasted load power</p> <p>18 requirements are 150 kilowatts; is that right?</p> <p>19 A. Yes. And I discuss in my declaration that</p> <p>20 that's the only constant in Figure 5. And I can get</p> <p>21 to that if you give me a minute.</p> <p>22 Q. No, I'm not asking about that. I just --</p>	<p style="text-align: right;">Page 100</p> <p>1 my question was simple.</p> <p>2 In those three rows of data -- sorry -- and</p> <p>3 each of the forecasted power load requirements are</p> <p>4 150 kilowatts; correct?</p> <p>5 A. Yes.</p> <p>6 Q. That's all I was asking.</p> <p>7 A. That's the only constant in Figure 5.</p> <p>8 Q. Okay.</p> <p>9 And each of those three 150 kilowatts load</p> <p>10 power requirements are calculated from P engine</p> <p>11 minus P loss; correct?</p> <p>12 A. In this particular case, it's a forecasted</p> <p>13 load power requirement. You can get to the load</p> <p>14 power requirement by also measuring P engine, and</p> <p>15 then we need to identify the candidate engine</p> <p>16 speeds. With that, you get the power losses. And</p> <p>17 then you can back out the load power requirement</p> <p>18 which you -- which, in this case, you're trying to</p> <p>19 maintain constant, which is a distinction in Xing.</p> <p>20 In Xing's process, the ultimate speed</p> <p>21 adjustments are based on the load power requirement</p> <p>22 which is the only constant as shown in Figure 5.</p>

<p style="text-align: right;">Page 101</p> <p>1 All other candidate variables and associated</p> <p>2 efficiency values are potential values that will</p> <p>3 vary depending on which candidate engine speed is</p> <p>4 chosen.</p> <p>5 Q. So --</p> <p>6 A. This -- I'm not finished.</p> <p>7 Q. I haven't asked a question.</p> <p>8 A. I was still answering my previous question.</p> <p>9 Q. Go ahead. Go ahead.</p> <p>10 A. Xing -- in Xing, the speed adjustments are</p> <p>11 not based on any measured load at the engines,</p> <p>12 whether in terms of measured engine torque or power,</p> <p>13 because while engine power has a loss component that</p> <p>14 varies with engine speed, the ultimate value of</p> <p>15 concern is the load power requirement.</p> <p>16 Q. In Column 10 of Xing -- I'm now looking at</p> <p>17 Column 10, Lines -- I guess that's 34, 33 or 34.</p> <p>18 The paragraph that begins, "It should be appreciated</p> <p>19 that as an alternative to utilizing the forecasted</p> <p>20 load power requirement, the controller, 116, may be</p> <p>21 configured to utilize current load power</p> <p>22 requirement."</p>	<p style="text-align: right;">Page 102</p> <p>1 Do you see that?</p> <p>2 A. Yes, I see that.</p> <p>3 Q. And as a basis for determining the</p> <p>4 candidate engine speeds; correct?</p> <p>5 A. That is correct. And I do discuss that in</p> <p>6 my declaration.</p> <p>7 Q. Great.</p> <p>8 So that column entitled Forecasted Load</p> <p>9 Power Requirement can also be called current load</p> <p>10 power requirement; correct?</p> <p>11 A. In one teaching of Xing, it -- it can be</p> <p>12 current.</p> <p>13 Q. And on that teaching of Xing, the current</p> <p>14 load power requirement is P engine minus P loss;</p> <p>15 correct?</p> <p>16 A. I think I answered that question earlier --</p> <p>17 Q. Good.</p> <p>18 A. In --</p> <p>19 Q. And that's --</p> <p>20 A. Sorry.</p> <p>21 Q. Okay.</p> <p>22 You answered that earlier. That's fine.</p>
<p style="text-align: right;">Page 103</p> <p>1 You do not disagree with that point,</p> <p>2 though?</p> <p>3 MR. ARGENTI: Objection. Form.</p> <p>4 THE WITNESS: In that teaching, Xing begins</p> <p>5 with a determination of load power requirement to</p> <p>6 identify a set of candidate or possible engine</p> <p>7 speeds for achieving the load power requirement,</p> <p>8 determining power loss for each candidate engine</p> <p>9 speeds, and then calculating a set of corresponding</p> <p>10 candidate or possible engine powers and torques</p> <p>11 which are then compared to efficiency values to find</p> <p>12 the candidate engine speed/torque pairs associated</p> <p>13 with fuel consumption value.</p> <p>14 Q. (By Mr. Sekyi) Okay.</p> <p>15 So each of those 150 kilowatts are</p> <p>16 calculated from P engine minus P loss in at least</p> <p>17 one embodiment of Xing?</p> <p>18 A. "This is a teaching where the load power</p> <p>19 requirement is calculated indirectly rather than</p> <p>20 measured directly. This is performed through the</p> <p>21 measurement of a current engine speed and current</p> <p>22 engine torque at the engine's output to calculate</p>	<p style="text-align: right;">Page 104</p> <p>1 the current engine power or load."</p> <p>2 Q. Where are you reading from in your</p> <p>3 declaration, please?</p> <p>4 A. Paragraph 44.</p> <p>5 And that is, "P engine, as discussed in</p> <p>6 Equation 1 of the Xing patent, which is the product</p> <p>7 of the measured engine speed and the measured engine</p> <p>8 torque. The load power requirement is then</p> <p>9 calculated by first estimating the current power</p> <p>10 loss for a given engine speed and then subtracting</p> <p>11 the estimated current power loss from the current</p> <p>12 engine power.</p> <p>13 "Thus, to the extent," -- and this is</p> <p>14 according to Dr. Stein that "to the extent that Xing</p> <p>15 describes determining an engine load, whether in</p> <p>16 terms of torque or power, it is done" -- "it is my</p> <p>17 opinion that it is done for the purpose of</p> <p>18 calculating load power requirement."</p> <p>19 Q. In the next column to the right of the</p> <p>20 Forecasted Load Power Requirement column titled</p> <p>21 Associated System Power Loss, there, Xing estimates</p> <p>22 the power loss at different candidate engine speeds;</p>

<p style="text-align: right;">Page 105</p> <p>1 correct?</p> <p>2 A. Yes. It determines power loss for each</p> <p>3 candidate engine speed.</p> <p>4 Q. And that's for each of the candidate engine</p> <p>5 speeds in the right-handmost column; correct?</p> <p>6 A. Right-handmost column?</p> <p>7 Q. Sorry. Left-handmost column.</p> <p>8 A. Yes, those are examples of candidate engine</p> <p>9 speeds.</p> <p>10 Q. The column immediately to the right of the</p> <p>11 associated system power is entitled Candidate Engine</p> <p>12 Power; correct?</p> <p>13 A. That is the correct title. You read it</p> <p>14 correctly.</p> <p>15 Q. And in each row immediately below -- in</p> <p>16 each cell immediately below the Candidate Engine</p> <p>17 Power, it is listed a value that is equal to the</p> <p>18 load power requirement plus the associated system</p> <p>19 power loss; correct?</p> <p>20 A. Yes.</p> <p>21 Q. So the candidate engine power is equal to</p> <p>22 the forecasted engine load plus associated system</p>	<p style="text-align: right;">Page 106</p> <p>1 power in each of those candidate engine powers;</p> <p>2 correct?</p> <p>3 A. Forecasted -- could you read that again,</p> <p>4 because I think you missed a couple of words there.</p> <p>5 Q. So the candidate engine power is equal to</p> <p>6 the forecasted engine load plus the associated</p> <p>7 system power loss --</p> <p>8 A. Loss.</p> <p>9 Q. -- in each of those candidate engine</p> <p>10 powers.</p> <p>11 MR. ARGENTI: Objection. Form.</p> <p>12 THE WITNESS: So the candidate engine power</p> <p>13 in Column 4 here is being calculated/estimated by</p> <p>14 adding the load power requirement to the associated</p> <p>15 system power loss using Equation 1 of Xing.</p> <p>16 Q. (By Mr. Sekyi) And then in the next column</p> <p>17 to the right of Candidate Engine Power is Candidate</p> <p>18 Engine Torque; correct?</p> <p>19 A. That is correct.</p> <p>20 Q. And that is calculated by dividing the</p> <p>21 candidate engine power by the candidate -- by the</p> <p>22 candidate engine speed; correct?</p>
<p style="text-align: right;">Page 107</p> <p>1 A. Yes, for each of the candidate engine and</p> <p>2 power -- engine power and speed pairs. A candidate</p> <p>3 engine torque -- that is, candidate engine loads</p> <p>4 expressed in terms of torque -- is determined by</p> <p>5 dividing each candidate engine power with its</p> <p>6 associated candidate engine speed.</p> <p>7 Q. And then inputting the candidate engine</p> <p>8 speeds and candidate engine torques into Xing</p> <p>9 Figure 11, Xing provides the engine BSFC efficiency</p> <p>10 and fuel consumption for each of the three points;</p> <p>11 correct?</p> <p>12 MR. ARGENTI: Objection. Form.</p> <p>13 THE WITNESS: Yes, for each -- sorry.</p> <p>14 For each set of engine torque and engine</p> <p>15 speeds is then utilized to determine the most</p> <p>16 fuel-efficient engine settings for achieving the</p> <p>17 divide load power requirement, which is in Column 2.</p> <p>18 An example of this is shown in Figure 11 in Xing,</p> <p>19 which I have produced in my declaration with</p> <p>20 annotations.</p> <p>21 And if you look at that, you can see that</p> <p>22 the candidate engine torque and candidate engine</p>	<p style="text-align: right;">Page 108</p> <p>1 speed pairs are plotted, which are annotated in</p> <p>2 blue, to determine which of the pairs of candidate</p> <p>3 engine torque and candidate engine speed intersects</p> <p>4 closest to the optimum efficiency point, 300, which</p> <p>5 the fuel efficiency of the engine -- at which the</p> <p>6 fuel efficiency of the engine is maximized; that is,</p> <p>7 at the minimum BSFC value, which is the</p> <p>8 brake-specific fuel consumption value. And I would</p> <p>9 note that the units for BSFC are incorrect in</p> <p>10 Figure 5.</p> <p>11 Q. (By Mr. Sekyi) Okay.</p> <p>12 Despite the incorrect units, though, BSFC,</p> <p>13 Xing derives -- obtains fuel consumption and BSFC</p> <p>14 figures from Figure 11; correct?</p> <p>15 A. For each pair of engine torque and engine</p> <p>16 speed, it -- it uses, as an example, Figure 5 to</p> <p>17 obtain the BSFC efficiency values. Here, it just</p> <p>18 states -- in Figure 5, it just states "engine fuel</p> <p>19 consumption." It's not necessarily BSFC.</p> <p>20 Q. Okay.</p> <p>21 So if I understand you correctly, in your</p> <p>22 opinion, Xing does not teach a machine that's --</p>

<p style="text-align: right;">Page 109</p> <p>1 adjusts engine speed based on engine power, because 2 the measurement -- because it only indirectly uses 3 engine power; is that correct? 4 A. In my opinion, in Xing's process, the 5 ultimate speed adjustments are based on the load 6 power requirement, which is the only constant, as 7 you can see, in Xing's Figure 5. All other 8 candidate variables and associated efficiencies are 9 potential value that will vary depending on which 10 candidate and engine speed is chosen. 11 In addition, Xing discloses the speed 12 adjustments are not based on any measured load at 13 the engine, whether in terms of measured engine 14 torque or power. Because while engine power has a 15 loss component that varies with engine speed, the 16 ultimate value of concern is the load power 17 requirement; that is, the amount of power required 18 for vehicle, 10, to finish useful work. As such, 19 the engine speed adjustments of Xing are based on 20 determining the load power requirement, rather than 21 the current engine load. 22 Q. Were you reading the entirety of Paragraph</p>	<p style="text-align: right;">Page 110</p> <p>1 50 of your declaration? 2 A. I read portions of Paragraph 50 in my 3 answer. 4 Q. So what does "indirect" mean to you? 5 MR. ARGENTI: Objection. Form. 6 Q. (By Mr. Sekyi) Sorry. 7 In the -- when you -- when you refer to 8 indirectly, for example, in Paragraph 45, where you 9 say, "However, while Xing may describe that one 10 means of determining the load power requirement, 11 P load, is indirectly through measurement of the 12 current engine torque or engine power," what do you 13 mean by "indirectly" there? 14 A. So what I mean is, there is also methods 15 that are discussed in Xing that also teach that 16 alternatively, the power load requirement, which is 17 the constant here, may be determined directly by 18 monitoring the output torque and the output speed of 19 the work vehicle, 10. So Xing describes a direct 20 method and then an indirect method, but it both 21 leads to the -- the -- what is needed in Xing's 22 method, which is a load power requirement.</p>
<p style="text-align: right;">Page 111</p> <p>1 In other words, any measurement of the load 2 at the engine can be bypassed entirely by directly 3 measuring the variable of interest, P load, at the 4 source, where the useful work is occurring. 5 (Stenographer clarification.) 6 THE WITNESS: In other words, in Xing, any 7 measurement of the load at the engine can be 8 bypassed directly -- sorry. 9 In other words, any measurement of the load 10 at the engine can be bypassed entirely by directly 11 measuring the variable of interest in Xing, which is 12 P load, or the load power requirement at the source; 13 that is, where the useful work is occurring. 14 And there is further evidence, because Xing 15 also teaches that a future load power requirement 16 may be used as a starting point to its method by 17 forecasting the load power requirement based on 18 previously calculated load power requirements. 19 And this is where, in Figure 5, you see the 20 word "Forecasted Load Power Requirement." 21 Q. (By Mr. Sekyi) Okay. 22 So if I understand you correctly, you're</p>	<p style="text-align: right;">Page 112</p> <p>1 saying that because there are other ways of 2 determining -- there are direct ways of determining 3 load power requirement, we can ignore the indirect 4 way of determining load power requirement; correct? 5 MR. ARGENTI: Objection. Form. 6 THE WITNESS: What I'm saying is that in 7 Xing, the load power requirement and not the current 8 engine load, torque or power, serves as a basis for 9 determining the most fuel-efficient operating 10 parameter. 11 Q. (By Mr. Sekyi) And the forecasted or the 12 current load power requirement in the -- strike 13 that. 14 Now, in your opinion, the basis for this -- 15 Xing's fuel consumption, the chosen -- sorry. 16 In your opinion, each of the three fuel 17 consumptions, candidate fuel consumptions listed in 18 Figure 5, is based on the current load power 19 requirement; correct? 20 A. The current load power, or the forecasted 21 load power requirement, is based on the load power 22 requirement and the candidate engine speeds.</p>

<p style="text-align: right;">Page 113</p> <p>1 Q. But it's not, is it?</p> <p>2 A. What is not?</p> <p>3 Q. The fuel consumption is not based on the</p> <p>4 load power requirement.</p> <p>5 MR. ARGENTI: Objection. Form.</p> <p>6 Q. (By Mr. Sekyi) If I understand the way</p> <p>7 you're using "based on," fuel consumption figures</p> <p>8 are based on candidate engine speed --</p> <p>9 engine speed/torque pairs. That's what you have</p> <p>10 annotated on Page 24.</p> <p>11 A. Oh, I understand your question.</p> <p>12 Q. Dr. Kemal, in order to have a candidate</p> <p>13 torque, there are multiple pieces of calculation</p> <p>14 between the load power requirement and candidate</p> <p>15 engine torque; correct?</p> <p>16 You have to -- correct?</p> <p>17 A. As I discussed earlier, the ultimate speed</p> <p>18 adjustments are based on the load power requirement,</p> <p>19 which is the only constant, and there is a process</p> <p>20 to get from there to the engine efficiencies, which</p> <p>21 I've discussed in my declaration that involve</p> <p>22 multiple calculations.</p>	<p style="text-align: right;">Page 114</p> <p>1 Q. And each of the current load power</p> <p>2 requirements in Figure 5, each of the 150s in</p> <p>3 Figure 5, is calculated from a single engine power;</p> <p>4 correct? That doesn't change between each of the</p> <p>5 forecasted load power -- the current load power</p> <p>6 requirements, sorry, in the second column to -- from</p> <p>7 the left?</p> <p>8 A. In Figure 5, the forecasted load power</p> <p>9 requirement is the only constant and remains at 150.</p> <p>10 Q. Yes.</p> <p>11 But my question was: Each of those</p> <p>12 constant values are all based on the same constant</p> <p>13 value of engine power; correct?</p> <p>14 MR. ARGENTI: Objection. Form.</p> <p>15 THE WITNESS: No. You can see the engine</p> <p>16 powers are changing.</p> <p>17 Q. (By Mr. Sekyi) Those are candidate engine</p> <p>18 powers. I'm talking about the measured engine power</p> <p>19 from which you derived the current load power</p> <p>20 requirement in Column 2.</p> <p>21 A. That's partly the basis of my disagreement</p> <p>22 with -- or why this method is not -- does not -- is</p>
<p style="text-align: right;">Page 115</p> <p>1 not the same in Patent '538. As I've mentioned</p> <p>2 earlier, that determining a current engine load is</p> <p>3 not necessary in Xing's efficiency method, but the</p> <p>4 load power requirement forming the basis for its</p> <p>5 method can be calculated without making a</p> <p>6 determination as to the current engine load.</p> <p>7 Q. So my question is: Because in some cases,</p> <p>8 it can be done without measuring engine load,</p> <p>9 therefore, engine load was never measured? Or it's</p> <p>10 unimportant?</p> <p>11 MR. ARGENTI: Objection. Form.</p> <p>12 THE WITNESS: Xing seeks to vary both</p> <p>13 engine speeds and engine torque or load to identify</p> <p>14 the target candidate engine speeds, which, itself,</p> <p>15 is paired with the candidate engine torque. This</p> <p>16 further illustrates to me that the selection of the</p> <p>17 target engine speed is made independent of any</p> <p>18 existing or measured engine load.</p> <p>19 Q. (By Mr. Sekyi) Dr. Kemal, in Table --</p> <p>20 Figure 5 on -- at Paragraph 50, you have multiple</p> <p>21 candidate engine torques; correct?</p> <p>22 A. That is correct.</p>	<p style="text-align: right;">Page 116</p> <p>1 Q. And you also have the current load power</p> <p>2 requirement; is that correct?</p> <p>3 A. The forecasted load power requirement is</p> <p>4 listed in Figure 5.</p> <p>5 Q. In the second column from the -- from the</p> <p>6 left; correct?</p> <p>7 A. The second column, yes.</p> <p>8 Q. And in each of those values of 150, there</p> <p>9 is a single measurement of engine load that -- that</p> <p>10 was done to calculate what the load power</p> <p>11 requirement would be; correct?</p> <p>12 A. No. Incorrect.</p> <p>13 Q. Why?</p> <p>14 A. Because if you look at -- and I've</p> <p>15 explained this earlier, I think, but if you look at</p> <p>16 the Equation 1 in Xing, if you are measuring P</p> <p>17 engine to get to a P load, you also have to estimate</p> <p>18 P losses. P losses are dependent on the engine</p> <p>19 speed.</p> <p>20 If you change -- if you take one engine</p> <p>21 speed, you may get to that engine load for your</p> <p>22 forecasted load power requirement. If you take a</p>

<p style="text-align: right;">Page 117</p> <p>1 different engine speed, you would get to a different 2 engine load, as you can see in Column 5 -- Column 4 3 and Column 5 of Figure 5 on Page 23 of my 4 declaration. 5 Q. Dr. Kemal, that is not the process that -- 6 prior to -- prior to, in Figure 5, calculating the 7 forecast load requirement, Xing measures engine 8 power; correct? 9 MR. ARGENTI: Objection. Form. 10 THE WITNESS: It's not necessary. 11 Q. (By Mr. Sekyi) I'm not saying it's 12 necessary. I'm saying in one embodiment, Xing 13 measures engine power; correct? 14 A. As I discussed earlier, in one embodiment, 15 the engine load is measured in Xing. 16 Q. And when Xing measures that load at that 17 engine speed, it calculates P loss; correct? 18 A. You can calculate the P loss once you know 19 the engine speed, as well as various additional data 20 sets, some of which have been described in the Xing 21 patent. 22 Q. And that is what Xing does; isn't that</p>	<p style="text-align: right;">Page 118</p> <p>1 correct? 2 A. It calculates the power loss for that -- 3 for that engine load and the engine speed. 4 Q. And after having calculated that engine 5 power and power loss, it calculates the current load 6 power requirements; correct? 7 A. In one embodiment, you can calculate the 8 current load power requirement, but that is -- 9 through that process, but there are other processes 10 in Xing and where you -- where you can just start 11 with measuring directly the load power requirement 12 or use a forecasted value of the load power 13 requirement. 14 Q. And in one example, when Xing calculates 15 that current load power requirement, the load power 16 requirement is 150 kilowatts shown in Figure 5; 17 correct? 18 A. So in this particular figure, for this 150, 19 the forecasted load power requirement, it does not 20 talk about the -- and it is associated with a 21 candidate engine torque or load of 165 kilowatt 22 engine power.</p>
<p style="text-align: right;">Page 119</p> <p>1 Q. And in Xing -- 2 A. And that's -- but -- and that is the 3 P engine at that particular speed for the load power 4 requirement. 5 Q. Dr. Kemal, I thought that was a candidate 6 speed, not an actual speed. 7 Sorry. That was the candidate power, not 8 an actual power. 9 A. So Xing does not discuss, in this table, 10 the actual speed or the actual, at that point, load 11 power requirement. 12 Q. Not in this -- not in this table; correct? 13 A. It does not -- it does not discuss that in 14 the method. It is looking for the load power 15 requirement and then using that for -- as a basis 16 for its achieving fuel efficiency pairs or arriving 17 on the fuel efficiency pairs. 18 Q. Dr. Kemal, Column 9 of Xing, Line 37, says, 19 "In one embodiment, the current load power 20 requirement" -- 21 A. Sorry. Just a second. 22 Yes. Okay.</p>	<p style="text-align: right;">Page 120</p> <p>1 Q. "In one embodiment, current" -- "the 2 current load power requirement for the work engine 3 may be determined indirectly by calculating the 4 current engine power, P engine, the current power 5 loss, P loss, for the work vehicle, 10. For 6 example, as indicated above, the controller, 116, 7 may be configured to continuously monitor the engine 8 speed and the engine torque, thereby allowing for 9 the current engine power to be calculated by the 10 controller"; correct? 11 A. Yes, you read that correctly. 12 Q. Okay. 13 "As such, Xing continues, by determining 14 the current engine power" -- 15 A. So where are you reading? 16 Q. I'm now at the bottom of that paragraph, so 17 starting at Line 53. 18 "As such, by determining the current engine 19 power and the current engine power loss" -- yeah, 20 "the current engine power loss, the current power 21 load requirement may be calculated using 22 Equation 1."</p>

<p style="text-align: right;">Page 121</p> <p>1 Do you see that?</p> <p>2 A. Yes, I see that.</p> <p>3 Q. And, now, that is not the candidate engine</p> <p>4 power. That's the current engine power; correct?</p> <p>5 A. According to this description, they are</p> <p>6 talking about a current engine power.</p> <p>7 Q. Now, Xing also explains in Column 10,</p> <p>8 around Line 33, that "It should be appreciated that</p> <p>9 as an alternative to utilizing the forecasted load</p> <p>10 power requirement, the controller, 116, may be</p> <p>11 configured to utilize the current load power</p> <p>12 requirement."</p> <p>13 Do you see that?</p> <p>14 A. Yes, I see that.</p> <p>15 Q. So in Figure 5, the forecasted load power</p> <p>16 requirement in the second column on the left can be</p> <p>17 replaced by the current load power requirement;</p> <p>18 correct?</p> <p>19 A. The way that Xing's method works, it is</p> <p>20 starting with estimating -- or what it needs is the</p> <p>21 load power requirement, as I've stated earlier.</p> <p>22 Q. Dr. Kemal, that's not what I asked you just</p>	<p style="text-align: right;">Page 122</p> <p>1 now. The question, let me repeat it, perhaps you</p> <p>2 didn't hear it well, is: Now Xing also explained --</p> <p>3 I'm sorry.</p> <p>4 (Stenographer clarification.)</p> <p>5 (The following record was read:</p> <p>6 "Q. So in Figure 5, the</p> <p>7 forecasted load power requirement</p> <p>8 in the second column on the left</p> <p>9 can be replaced by the current</p> <p>10 load power requirement;</p> <p>11 correct?")</p> <p>12 THE WITNESS: In one teaching of Xing, it</p> <p>13 can use a current load power requirement.</p> <p>14 Alternatively, the power load requirement may be</p> <p>15 determined directly as it's stated in Xing, Column</p> <p>16 9, starting on Line 57.</p> <p>17 But alternatively, the load power</p> <p>18 requirement may be determined directly by monitoring</p> <p>19 the output torque and the output speed of the work</p> <p>20 vehicle. And as I mentioned earlier, forecasted</p> <p>21 load power requirements may also be used.</p> <p>22 Q. (By Mr. Sekyi) Then in Paragraph 49 of</p>
<p style="text-align: right;">Page 123</p> <p>1 your declaration, you explain that for each of the</p> <p>2 candidate -- candidate engine speeds, candidate</p> <p>3 engine powers are determined by adding the</p> <p>4 calculated power loss value, P loss, to the specific</p> <p>5 load power requirement of interest, e.g., 150</p> <p>6 kilowatts, as shown in Figure 5; correct?</p> <p>7 A. That is correct.</p> <p>8 Q. And in each of --</p> <p>9 MR. SEYKI: Let's take a break.</p> <p>10 THE WITNESS: Okay. Thank you.</p> <p>11 THE STENOGRAPHER: We're off the record.</p> <p>12 The time is 2:24 p.m.</p> <p>13 (Recess from 2:24 to 2:35 p.m.)</p> <p>14 THE STENOGRAPHER: We're back on the</p> <p>15 record. The time is 2:35 p.m.</p> <p>16 Q. (By Mr. Sekyi) Dr. Kemal --</p> <p>17 A. I'm sorry.</p> <p>18 Q. -- in Claim 1 of the '538 patent, it</p> <p>19 requires one or more predefined efficiency points at</p> <p>20 least partially based on predetermined fuel</p> <p>21 consumption rates.</p> <p>22 Do you see that?</p>	<p style="text-align: right;">Page 124</p> <p>1 A. Yes.</p> <p>2 Q. What are predetermined fuel consumption</p> <p>3 rates, as distinct from predefined efficiency</p> <p>4 points?</p> <p>5 A. The predetermined fuel consumption rates</p> <p>6 are what we typically would refer to as an engine</p> <p>7 map. There's -- they are shown, for instance, in</p> <p>8 '538 patent in Figure 4 where for different pairs of</p> <p>9 engine load and engine speed, you have -- you</p> <p>10 determine whether or not there is low fuel</p> <p>11 efficiency or high fuel efficiency.</p> <p>12 Predefined efficiency points are -- could</p> <p>13 be more than that. It could be -- you could look at</p> <p>14 engine efficiency in other ways; and so</p> <p>15 predetermined fuel efficiency points get you to</p> <p>16 the -- sorry.</p> <p>17 Predetermined fuel consumption rates --</p> <p>18 sorry.</p> <p>19 Let me start again. The predetermined fuel</p> <p>20 consumption rates are engine maps, such as Figure 4</p> <p>21 in the '538 patent shown in Page 9 of my</p> <p>22 declaration. What they do is they -- for a given</p>

<p style="text-align: right;">Page 125</p> <p>1 engine load and engine speed, they are premapped to</p> <p>2 understand how fuel-efficient that particular</p> <p>3 operating point is for the engine. So you can go</p> <p>4 from low fuel efficiency to high fuel efficiency.</p> <p>5 MR. ARGENTI: I'm not sure if your answer</p> <p>6 was complete there, Dr. Kemal, but if it was, I'd</p> <p>7 interject before the next question. I think we have</p> <p>8 the audio and video not activated yet.</p> <p>9 Q. (By Mr. Sekyi) Dr. Kemal, a little</p> <p>10 confused.</p> <p>11 You said that the predetermined fuel</p> <p>12 consumption rates are engine maps such as Figure 4,</p> <p>13 I guess, of the '538 patent. But then you went to</p> <p>14 talk on about fuel efficiency, and I see Figure 4</p> <p>15 identifies fuel efficiencies.</p> <p>16 A. Right. So the predetermined efficiency</p> <p>17 points here are at least partly based on</p> <p>18 predetermined fuel consumption rates. Whereas, the</p> <p>19 fuel consumption rate is for a given engine load and</p> <p>20 engine speed, what is the fuel consumption. And</p> <p>21 based on that, we know how efficient the fuel -- the</p> <p>22 engine is or -- so we can go from low fuel</p>	<p style="text-align: right;">Page 126</p> <p>1 efficiency to high fuel efficiency.</p> <p>2 Q. So Figure 11 of Xing is also a plot of</p> <p>3 data; correct?</p> <p>4 A. It is a plot of data; that is correct.</p> <p>5 Q. And it has two axes, an engine torque axis</p> <p>6 and an engine speed axis as well; correct?</p> <p>7 A. Yes, that is correct.</p> <p>8 Q. And for each engine torque and engine</p> <p>9 speed, there is a corresponding fuel consumption</p> <p>10 data point; correct?</p> <p>11 MR. ARGENTI: Objection. Form.</p> <p>12 THE WITNESS: For each particular torque</p> <p>13 and engine, you can read off from the data plot fuel</p> <p>14 consumption.</p> <p>15 Q. (By Mr. Sekyi) And that is also an engine</p> <p>16 map; correct?</p> <p>17 A. That is another way of engine map. This is</p> <p>18 very similar data as in Figure 4, except it's used</p> <p>19 very differently in the two patents.</p> <p>20 Q. And I guess I'll go back to my first</p> <p>21 question. I'm still not quite understanding the</p> <p>22 difference between engine fuel consumption --</p>
<p style="text-align: right;">Page 127</p> <p>1 sorry -- a predetermined fuel consumption rate and a</p> <p>2 predefined efficiency point as claimed.</p> <p>3 MR. ARGENTI: Objection. Form.</p> <p>4 THE WITNESS: So as I had stated earlier, a</p> <p>5 predetermined fuel consumption rate is a map -- is a</p> <p>6 data on -- on a table or a map where, for a given</p> <p>7 engine load and engine speed, you can read off the</p> <p>8 known fuel consumption of -- of the engine, and that</p> <p>9 determines the fuel efficiency. Specifically, if</p> <p>10 you want to go to from there to the -- the value</p> <p>11 shown in Figure 5 of the Xing patent to the engine</p> <p>12 BSFC efficiency, if you know the fuel consumption</p> <p>13 for a given engine torque and engine speed and you</p> <p>14 know the power, you can get to the fuel efficiency</p> <p>15 or the BSFC value.</p> <p>16 Q. How do you get there?</p> <p>17 A. So, basically, you take the fuel</p> <p>18 consumption and divide it by the engine power.</p> <p>19 MR. SEKYE: Okay. Thank you.</p> <p>20 Those are my questions.</p> <p>21 MR. ARGENTI: Okay.</p> <p>22 In that case, can we take a short break and</p>	<p style="text-align: right;">Page 128</p> <p>1 confer with my colleague and see if I have any</p> <p>2 redirect?</p> <p>3 THE STENOGRAPHER: We're off the record.</p> <p>4 The time is 2:44 p.m.</p> <p>5 (Recess from 2:44 p.m. to 2:51 p.m.)</p> <p>6 THE STENOGRAPHER: We're back on the</p> <p>7 record. The time is 2:51 p.m.</p> <p>8 MR. ARGENTI: No questions for me. Thank</p> <p>9 you for your time, Dr. Kemal.</p> <p>10 THE WITNESS: Thank you very much.</p> <p>11 MR. SEKYE: Thank you.</p> <p>12 THE STENOGRAPHER: Are we ready to go off</p> <p>13 the record?</p> <p>14 MR. SEKYE: Yes.</p> <p>15 THE STENOGRAPHER: This completes today's</p> <p>16 deposition of Dr. Abid Kemal. The time is 2:51 p.m.</p> <p>17 We are off the record.</p> <p>18 (Whereupon, the deposition of DR. ABID</p> <p>19 KEMAL concluded at 2:51 p.m.)</p> <p>20</p> <p>21</p> <p>22</p>

<p style="text-align: right; margin-bottom: 10px;">Page 129</p> <p>1 I, HEATHER J. BAUTISTA, CSR No. 11600, Certified</p> <p>2 Shorthand Reporter, certify:</p> <p>3 That the foregoing proceedings were taken before</p> <p>4 me at the time and place therein set forth, at which</p> <p>5 time the witness declared under penalty of perjury; that</p> <p>6 the testimony of the witness and all objections made at</p> <p>7 the time of the examination were recorded</p> <p>8 stenographically by me and were thereafter transcribed</p> <p>9 under my direction and supervision;</p> <p>10 That the foregoing is a full, true, and correct</p> <p>11 transcript of my shorthand notes so taken and of the</p> <p>12 testimony so given;</p> <p>13 (XX) Reading and signing was not requested/offered.</p> <p>14 I further certify that I am not financially</p> <p>15 interested in the action, and I am not a relative or</p> <p>16 employee of any attorney of the parties, nor of any of</p> <p>17 the parties.</p> <p>18 I declare under penalty of perjury under the laws</p> <p>19 of California that the foregoing is true and correct.</p> <p>20 Dated: September 19, 2023</p> <p>21 _____</p> <p>22 HEATHER J. BAUTISTA, CSR, CRR, RPR, CLR</p>	<p style="text-align: right; margin-bottom: 10px;">Page 130</p> <p>1 Dr. Abid Kemal, c/o</p> <p>2 Wilson Sonsini Goodrich & Rosati</p> <p>3 650 Page Mill Road</p> <p>4 Palo Alto, California 94304-1050</p> <p>5</p> <p>6 Case: Wirtgen America Inc. v. Caterpillar Inc.</p> <p>7 Date of deposition: September 12, 2023</p> <p>8 Deponent: Dr. Abid Kemal</p> <p>9</p> <p>10 Please be advised that the transcript in the above</p> <p>11 referenced matter is now complete and ready for signature.</p> <p>12 The deponent may come to this office to sign the transcript,</p> <p>13 a copy may be purchased for the witness to review and sign,</p> <p>14 or the deponent and/or counsel may waive the option of</p> <p>15 signing. Please advise us of the option selected.</p> <p>16 Please forward the errata sheet and the original signed</p> <p>17 signature page to counsel noticing the deposition, noting the</p> <p>18 applicable time period allowed for such by the governing</p> <p>19 Rules of Procedure. If you have any questions, please do</p> <p>20 not hesitate to call our office at (202)-232-0646.</p> <p>21</p> <p>22 Sincerely,</p> <p>Digital Evidence Group</p> <p>Copyright 2023 Digital Evidence Group</p> <p>Copying is forbidden, including electronically, absent</p> <p>express written consent.</p>
<p style="text-align: right; margin-bottom: 10px;">Page 131</p> <p>1 Digital Evidence Group, L.L.C.</p> <p>2 1730 M Street, NW, Suite 812</p> <p>3 Washington, D.C. 20036</p> <p>4 (202) 232-0646</p> <p>5</p> <p>6 SIGNATURE PAGE</p> <p>7 Case: Wirtgen America Inc. v. Caterpillar Inc.</p> <p>8 Witness Name: Dr. Abid Kemal</p> <p>9 Deposition Date: September 12, 2023</p> <p>10</p> <p>11 I do hereby acknowledge that I have read</p> <p>12 and examined the foregoing pages</p> <p>13 of the transcript of my deposition and that:</p> <p>14</p> <p>15 (Check appropriate box):</p> <p>16 () The same is a true, correct and</p> <p>17 complete transcription of the answers given by</p> <p>18 me to the questions therein recorded.</p> <p>19 () Except for the changes noted in the</p> <p>20 attached Errata Sheet, the same is a true,</p> <p>21 correct and complete transcription of the</p> <p>22 answers given by me to the questions therein</p> <p>recorded.</p> <p>16 _____</p> <p>17 DATE WITNESS SIGNATURE</p> <p>18</p> <p>19</p> <p>20</p> <p>21 _____</p> <p>22 DATE NOTARY</p>	<p style="text-align: right; margin-bottom: 10px;">Page 132</p> <p>1 Digital Evidence Group, LLC</p> <p>2 1730 M Street, NW, Suite 812</p> <p>3 Washington, D.C. 20036</p> <p>4 (202)232-0646</p> <p>5</p> <p>6 ERRATA SHEET</p> <p>7</p> <p>8 Case: Wirtgen America Inc. v. Caterpillar Inc.</p> <p>9 Witness Name: Dr. Abid Kemal</p> <p>10 Deposition Date: September 12, 2023</p> <p>11 Page No. Line No. Change</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21 _____</p> <p>22 Signature Date</p>

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