

Expert Declaration In Support of Petitioner's Petition for *Inter Partes* Review of
U.S. Patent Nos. 10,488,871

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April 15, 2024

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I. INTRODUCTION

A. Background and Qualifications

1. My name is Gary R. Wooley. I have been retained by the petitioner The Integration Group of Americas, Inc. (“TIGA”) in this Inter Partes Review (“IPR”) as an independent expert in the relevant art.

2. I have been asked to provide my opinions and views on the materials I have reviewed in the IPRs related to U.S. Patent Nos. 8,649,909 (“the ‘909 patent”); 9,342,078 (“the ‘078 patent”); 9,898,014 (“the ‘014 patent”); 10,488,871 (“the ‘871 patent”); 11,175,680 (“the ‘680 patent”); 11,294,403 (“the ‘403 patent”); and 11,726,504 (“the ‘504 patent”) (collectively, “the Challenged Patents”) and the scientific and technical knowledge regarding the same subject matter. I have been asked to consider what one of ordinary skill in the art would have understood from the Challenged Patents. I have also considered whether certain references disclose or suggest the features recited in the claims of the Challenged Patents. My opinions are set forth below.

3. My opinions are guided by my appreciation of how a person of ordinary skill in the art would have understood the claims of the Challenged Patents at the time of the alleged invention, which I have been asked to initially assume is December 7, 2012, the earliest claimed priority date of the Challenged Patents.

4. Based on my experience and expertise, it is my opinion that the

references discussed in detail below disclose or suggest all of the features recited in claims 18-23, 25-32, and 34 of the '871 Patent and that it would have been obvious to combine the features in the manner described below to arrive at the claimed invention. Nothing in any of the challenged claims is new or operates in a manner that would have been unexpected by a person of ordinary skill in the art.

5. I am currently the President of Wooley & Associates, Inc. Attached as Appendix A is my current resumé. I earned a Bachelor of Science degree in Mechanical Engineering, a Master of Science degree in Engineering Mechanics, and a Ph.D. in Engineering Sciences from Louisiana State University. I worked for four major oil companies (Shell, Chevron (twice), Exxon, and Arco) and have been providing petroleum and mechanical engineering consulting services to the petroleum industry since 1978. I served as Vice-President of Enertech Engineering and Research Company from 1978 to 1986 and have been President of Wooley & Associates, Inc. since 1986. I have been a member, invited speaker, and technical committee chair for various professional societies such as ASME, SPE, API, and ASM. I have published numerous peer-reviewed articles in the professional literature and have served as a reviewer of technical articles for SPE and ASME. I am a member of the LSU ME Alumni Achievement Lecture Club, the LSU Engineering Hall of Distinction, the LSU Alumni Association Hall of Distinction, and Alumnus of the Year, and I currently serve as chair of the LSU College of

Engineering Dean's Advisory Council.

6. With respect to the specific subject matter at issue in this IPR—remotely controlling fluid-handling devices at petroleum facilities—I have extensive experience. My early oilfield experience with four major oil companies exposed me to remote control of fluid handling at gas processing plants, drill sites, production facilities, and offshore platforms. Analog devices to remotely control fluid handling were used early on and are still in use. More recently, digital devices were introduced to remotely control fluid handling and have added many new capabilities. Recently I have worked on consulting projects that involve analog and digital control of drilling mud in wellbores for onshore and offshore wells. Digital remote control of fluid handling has significantly expanded recently during fracture stimulation of horizontally drilled oil and gas wells in shale formations. I have provided engineering consulting services on fracture stimulation using digital remote fluid handling, including well-site visits and patent infringement evaluation.

B. Compensation.

7. In consideration for my services, my work on this case is being billed to Petitioner at an hourly rate of \$720 per hour, independent of the outcome of this proceeding. I am also being reimbursed for reasonable expenses I incur in relation to my services provided for this proceeding.

II. METHODOLOGY AND MATERIALS CONSIDERED

8. My opinions expressed herein are based on my review of the Challenged Patents, their respective prosecution histories (including several patents listed within those prosecution histories), extrinsic evidence relating to the technology of the Challenged Patents, and other evidence cited in this declaration.

9. I further understand that the application resulting in the ‘909 Patent was filed on December 7, 2012, and that the remaining Challenged Patents are continuations of the ‘909 Patent and as such, share the same specification. My opinions are also based on my technical experience, knowledge, and expertise in the area of LED drivers and dimmers.

10. More specifically, for this work, I have been asked to review the Challenged Patents including the specification and claims, and the Challenged Patents’ prosecution histories. In developing my opinions related to the Challenged Patents, I have considered the materials cited herein, including those items itemized in the Exhibit Table below.

Exhibit	Description
Ex 1001	U.S. Patent No. 10,488,871
Ex 1002	Declaration of Dr. Gary Wooley
Ex 1003	Curriculum Vitae of Dr. Gary Wooley
Ex 1004	File Wrapper for U.S. Patent No. 10,488,871
Ex 1005	US Patent 7,424,399 to Khan
Ex 1006	U.S. Patent No. 9,709,995 to Gutierrez

Exhibit	Description
Ex 1007	Fundamentals of Computing With C++
Ex 1008	Learning Java, 3 rd Edition
Ex 1009	Java Threads, 2 nd Edition
Ex. 1010	Claim Construction Order (Dkt. 93)

11. This declaration contains my opinions with respect to the subject matter of this proceeding and with the understandings as set forth herein. I specifically reserve the right to formulate and offer additional or supplemental opinions based on any additional information, depositions, discovery, or evidence that may be provided or derived, future court rulings, or agreements between the parties, to the extent permitted by the Board.

III. OVERVIEW OF LEGAL CONSIDERATIONS.

12. My understanding of the law is based on information provided by counsel for Petitioner.

13. I do not have any formal legal training, and I am not an attorney. TIGA's counsel has informed me of certain legal principles that I applied in my analysis. Those legal principles are summarized below.

14. The following section summarizes the law as I have been instructed to apply it in formulating and rendering my opinions found later in this declaration. I understand that, in an *inter partes* review proceeding, patent claims may be deemed unpatentable if it is shown that they were anticipated or rendered obvious in view of

the prior art. I understand that prior art in an *inter partes* review is limited to patents or printed publications that predate the priority date of the patent at issue.

A. Person of Ordinary Skill in the Art

15. I was asked to provide my opinion as a person of skill in the art (“POSITA”) as it relates to the Challenged Patents during the period leading up to the earliest claimed priority date. I considered several factors, including the types of problems encountered in the art, the solutions to those problems, the pace of innovation in the field, the sophistication of the technology, and the education level of active workers in the field. I provide that level below in Section IV.

B. Anticipation

16. I understand that when determining whether a claim is anticipated is based on underlying factual issues including the content of the prior art and the level of ordinary skill in the art. I further understand that for a single reference to anticipate a claim, “the four corners of [that] document describes every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation.” *In re Hodges*, 882 F.3d 1107, 1111 (Fed. Cir. 2018) (citing *Spancion, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1356 (Fed. Cir. 2010)).

17. Invalidity for anticipation requires that “[t]he identical invention must be shown in as complete detail as contained in the patent claim.” *TF3 Ltd v.*

Tre Milano, LLC, 894 F.3d 1366, 1374 (Fed. Cir. 2018).

C. Obviousness

18. I understand that, when determining whether a claim is “obvious,” the analysis is based on underlying factual issues including the content of the prior art and the level of ordinary skill in the art. I further understand that for a single reference or a combination of references to render the claimed invention obvious, a POSITA must have been able to arrive at the claims by modifying or combining the references.

19. I have further been informed and understand that a claim is unpatentable as obvious if the difference between the subject matter sought to be patented and the prior art is such that the subject matter as a whole would have been obvious at the time the invention was made to a POSITA.

20. I also have been informed and understand that the combination of familiar elements according to known methods is obvious when it does no more than yield predictable results. However, I further understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. I understand that, to prove a claim would have been obvious, one must demonstrate that a POSITA would have been motivated to combine or modify the prior art to achieve the claimed invention while having a reasonable expectation of success in doing so.

21. I further understand that a claim may be obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims. I also understand that if a POSITA could implement a predictable variation, then the claim is likely unpatentable. For the same reason, if a technique has been used to improve one device and a POSITA would recognize that it would improve similar devices in the same way, then using the technique is obvious. I further understand that a claim can be obvious if it combines old elements with no change to their respective functions, or alters prior art by merely substituting one element for another known in the field to yield a predictable result.

D. Claim Construction

22. I have been advised that “in an *inter partes* review proceeding, a claim of a patent ... shall be construed using the same claim construction standard that would be used to construe the claim in a civil action ..., including construing the claim in accordance with the ordinary and customary meaning of such claim as is understood by” a person of ordinary skill in the art (“POSITA”). 37 C.F.R. § 42.100(b). Each claim term challenged by this Petition should be construed in accordance with its ordinary and customary meaning for the purposes of resolving the issues raised in this Petition.

23. I have followed these principles in my analysis throughout this

declaration.

IV. LEVEL OF ORDINARY SKILL IN THE ART

24. In determining the characteristics of a person of ordinary skill in the art at the time of the claimed invention, several things should be considered, including the factors discussed below, as well as (1) the levels of education and experience of the inventor and other persons actively working in the relevant field; (2) the types of problems encountered in the field; (3) prior art solutions to these problems; (4) the rapidity in which innovations are made; and (5) the sophistication of the relevant technology.

25. All of the opinions that I provide herein are provided through the lens of a person having ordinary skill at the relevant time (prior to 2012, which I understand is the priority date claimed by the Challenged Patents). In my opinion, a person having ordinary skill in the art (“POSITA”) at the time of the alleged invention would have had at least a bachelor’s degree in mechanical, chemical, or electrical engineering, computer science, or a related field and significant experience with remotely controlling fluid-handling devices, like SCADA systems. I am a person of ordinary skill in the art under the above-provided standard.

V. TECHNICAL BACKGROUND OF THE CHALLENGED PATENTS

A. Background of the Relevant Technology

26. The Challenged Patents relate to the remote operation of fluid-handling devices. In the oil and gas industry, fluid handling systems direct, measure, display,

and control the flow of fluids—liquid chemicals or condensed gases—across a manufacturing plant or factory. Because of the potential hazards posed by the fluids they manage, where possible, industrial oil and gas producers manage operations remotely to keep personnel out of harm’s way. To enhance operational performance and improve worker safety, the oil and gas industry long ago adopted technologies for remote monitoring and control of fluid handling systems. <https://www.bakerhughes.com/oilfield-services-and-equipment-digital/remote-operations>.

27. The typical operation of industrial fluid handling systems places sensor and actuator functions on-site, supported by a remote controller that receives information from the sensors and transmits instructions to the actuators. *See e.g.* <https://www.eetimes.com/industrial-sensors-and-control-the-basics-part-i/>. The on-site sensors detect operational information such as flow rate, temperature, pressure, pH, or other fluid properties, and deliver that information to associated controller devices. <https://www.sciencedirect.com/topics/materials-science/sensor-system>. The fluid handling components also include actuator functions that allow for electronic control of the components, thus enabling remote operation of system components, for example, motors, pumps, or valves, based on commands received from a controller device. *See e.g.*, <https://www.fluidcontrols.co.uk/what-does-an-actuator->

do/#:~:text=Actuators%20are%20the%20unsung%20heroes,we%20know%20a%20lot%20about; see also, <https://www.emerson.com/en-us/industries/automation/marine/marine-systems-solution/valve-remote-control-systems>.

B. The Alleged Invention

28. The ‘871 Patent, entitled “Remote Control of Fluid-Handling Devices,” describes a hosted, networked, remote industrial monitoring and control that includes a computer-implemented datastore for storing a plurality of accounts, each account corresponding to an entity operating one or more geographically distributed fluid-handling facilities, the accounts associating different fluid-handling facilities with different entities; and addresses by which industrial monitoring or control equipment at the facilities is accessible via network connections. The monitoring or control equipment includes sensors configured to measure fluid handled at respective fluid-handling facilities and actuators configured to manipulate fluid flow at respective fluid-handling facilities, at least some of the fluid-handling facilities including both a plurality of the sensors and a plurality of the actuators. Ex. 1001; Claim 1.

29. The monitoring or control equipment also includes computer modules configured to obtain data from the sensors at the facilities and send commands to the actuators at the facilities via the network connections; and modules configured to

send respective instructions to present respective control interfaces on respective user-computing devices logged in to respective ones of the accounts and to receive respective commands to control respective actuators from the respective user computing devices. Ex. 1001, Claim 1.

C. Prosecution History Summary

1. The ‘871 Patent History (Ex. 1004)

30. The application resulting in the ‘871 Patent was filed on January 10, 2018. The present application is a continuation of U.S. Patent Application 14/984,422 filed on December 30, 2015, and titled Remote Control of Fluid-handling Devices, which is a continuation of 14/147,190, issued as U.S. Patent 9,342,078, filed January 3, 2014, titled Remote Control of Fluid-handling Devices, which is a continuation of U.S. Patent Application 13/708,557, issued as U.S. Patent 8,649,909, filed December 7, 2012, and titled Remote Control of Fluid-handling Devices. Ex. 1001, Cover.

31. In a first office action, the Examiner rejected Claims 21-54 on the ground of nonstatutory double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 9,898,014. Ex. 1004, 200-215. On July 1, 2019, the Applicant filed a terminal disclaimer limiting the term of any patent issued from the pending application to that of the ‘014 Patent. Ex. 1004, at 104-31.

32. On July 18, 2019, the USPTO issued a Notice of Allowability allowing

Claims 21-54. Ex. 1004, at 85-90.

D. Overview of the Prior Art

1. Khan (Ex. 1005)

33. U.S. Patent No. 7424,399 to Khan was filed on June 9, 2006, and issued on September 9, 2008. Khan claims priority to U.S. Provisional Patent Application Ser. No. 60/689,257, filed Jun. 10, 2005, and entitled Systems And Methods For Fluid Quality Sensing, Data Sharing And Data Visualization. Khan is prior art under pre-AIA § 102(a).

34. Khan teaches receiving fluid test data generated from multiple different entities and permits authorized users affiliated with the different entities, as well as others, to visualize information associated with that data via the Internet using graphical computer interfaces at respective computers. The fluid test data can be gathered using portable sensor units equipped with GPS and wireless communication to transmit the fluid test data and geographical information to the service provider. Ex. 1005, Abstract.

2. Gutierrez (Ex. 1006)

35. U.S. Patent No. 9,709,995 to Gutierrez was filed on December 22, 2014, and published on April 16, 2015. Gutierrez is a continuation of U.S. Patent Application No. 12/794,898 filed on June 7, 2010, published on December 9, 2010, and claiming the benefit of Provisional U.S. Patent Application No. 61/184,890 filed on June 8, 2009. Gutierrez is prior art under pre-AIA § 102(a).

36. Gutierrez teaches a chemical injection system that includes a pump connected to a chemical reservoir and pipeline that can all be controlled using a local motor controller connected to a central controller and remote computing device. Ex. 1006, Abstract. The controller in Gutierrez includes translator capabilities that allow the remote computing device to send commands that can be translated into the protocol required to control the local pump operations. *Id.*

VI. SUMMARY OF MY OPINIONS

37. Having reviewed the Challenged Patents and the prior art discussed herein, I have formed the following opinions:

- Khan Anticipates Claims 18-21, 23, 25- 29, 31, 32, and 34, or would be obvious to a POSITA in view of Khan.
- Gutierrez Anticipates Claims 18, 22-23, 26-32, and 34, or would be obvious to a POSITA in view of Gutierrez, or Gutierrez in view of Khan.

A. Opinions Regarding the ‘871 Patent

1. Ground 1: Kahn Anticipates Claims 18, 22-23, 25-31, and 34, or would be obvious to a POSITA in view of Khan.

a. Claim 18

[18.1] - A method, comprising:

38. To the extent that the Board finds that the preamble is limiting, Kahn discloses a method. *See, e.g.,* Ex. 1005, 1:28-36, Claim 1. A POSITA would recognize that Kahn discloses a method. Therefore, Kahn discloses a method.

[18.2] - storing, with one or more processors, records comprising:

39. A server is a computer or system that provides resources, data, services, or programs to other computers, known as clients, over a network. See <https://www.paessler.com/it-explained/server>. A command center server is simply a server disposed at a command center or a central place for executing orders and supervising tasks. Common to every command center are three general activities: inputs, processes, and outputs.

40. A controller, in a computing context, is a hardware device or a software program that manages or directs the flow of data between two entities. In computing, controllers may be cards, microchips, or separate hardware devices for the control of a peripheral device. In general, a controller can be thought of as something or someone that interfaces between two systems and manages communications between them. See <https://www.techtarget.com/whatis/definition/controller>.

41. Controllers are capable of sending commands, instructions, target values, target states, etc., to different components in the well site, including other fluid-handling devices. Controllers can also receive measurement data, commands, instructions, target values, and target states from different fluid-handling devices. Finally, controllers can also make a determination about whether measured values fall within preset parameters. Controllers can also collect data from sensors and fluid-handling devices either by queried sampling to immediately read all enabled

digital and analog input pins or automatic sampling to transmit the sensor data periodically or whenever a digital pin changes. See <https://www.techtarget.com/whatis/definition/control-system>.

42. A POSITA would recognize that Kahn discloses storing records, with one or more processors through its disclosure of centralized data collection points. *See, e.g.*, Ex. 1005, 8:51-59, 9:53-58, 17:18-30, 18:48-52, 63-65, 19:5-23, 19:58-65, 23:27-31. Therefore, Kahn discloses storing records, with one or more processors.

[18.3] - a plurality of accounts, each account corresponding to an entity operating one or more geographically distributed fluid-handling facilities, the accounts associating different fluid-handling facilities with different entities; and

43. The typical operation of industrial fluid handling systems places sensor and actuator functions on-site, supported by a remote controller that receives information from the sensors and transmits instructions to the actuators. *See e.g.* <https://www.eetimes.com/industrial-sensors-and-control-the-basics-part-i/>. The on-site sensors detect operational information such as flow rate, temperature, pressure, pH, or other fluid properties, and deliver that information to associated controller devices. <https://www.sciencedirect.com/topics/materials-science/sensor-system>. The fluid handling components also include actuator functions that allow for electronic control of the components, thus enabling remote operation of system components, for example, motors, pumps, or valves, based on commands received

from a controller device. *See e.g.*, [https://www.fluidcontrols.co.uk/what-does-an-actuator-do/#:~:text=Actuators%20are%20the%20unsung%20heroes,we%20know%20a%20lot%20about](https://www.fluidcontrols.co.uk/what-does-an-actuator-do/#:~:text=Actuators%20are%20the%20unsung%20heroes,we%20know%20a%20lot%20about;); *see also*, <https://www.emerson.com/en-us/industries/automation/marine/marine-systems-solution/valve-remote-control-systems>.

44. Kahn discloses that centralized data collection points connect to sensor unit 110 at designated facilities from different entities, i.e. “accounts.” *See, e.g.*, Ex. 1005, 16:40-18:52, 25:5-12. A hallmark of the distribution system in Kahn is the ability to identify the location of and communicate with the system’s sensor units. Ex. 1005, 4:12-25, 11:2-15; *see also id.*, 10:8-13 (“Physical events, such as a breakage of a pipe might be detected through a pattern of sensor units 110 reporting readings that deviate from historic norms, for example, reduced water pressure compared to historic norms, thereby identifying the exact location or proximate location of the breakage.”); 23:51-62. Kahn discloses a user interface showing data from geographically distributed fluid handling facilities from multiple different entities. Ex. 1005, Abstract, 2:50-54, 25:5-12.

45. A POSITA would recognize that Kahn discloses a plurality of accounts, namely one or more geographically distributed fluid-handling facilities with different entities.

46. Therefore, Kahn discloses the plurality of accounts recited in the '871 Patent.

[18.4] - addresses by which industrial monitoring or control equipment at the facilities is accessible via network connections, the monitoring or control equipment including sensors configured to measure fluid handled at respective fluid-handling facilities and actuators configured to manipulate fluid flow at respective fluid-handling facilities, at least some of the fluid-handling facilities including both a plurality of the sensors and a plurality of the actuators;

47. A network interface is the point of interconnection between a computer and a private or public network. A network interface is generally a network interface card (NIC) but does not have to have a physical form. Instead, the network interface can be implemented in software.
<https://docs.oracle.com/javase%2Ftutorial%2F/networking/nifs/definition.html#:~:text=A%20network%20interface%20is%20the,can%20be%20implemented%20in%20software.>

48. A Process Control Network (PCN) is a communications network layer that is a part of the Industrial Automation networks in Process Industries. This network is used to transmit instructions and data between control and measurement units and Supervisory Control and Data Acquisition (SCADA) equipment. See, e.g., <https://www.infosecinstitute.com/resources/scada-ics-security/process-control-network-pcn-evolution/>.

49. Kahn discloses a system with sensor unit 110 that includes multiple sensors (e.g., first sensor 111A and second sensor 111B) a communication unit that connects via a network to centralized data collection points. *See, e.g.*, Ex. 1005, 5:62-6:16, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3. A hallmark of the distribution system in Kahn is the ability to identify the location of and communicate with the system's individual sensor units. Ex. 1005, 4:12-25, 11:2-15; *see also* Ex. 1005, 10:8-13; 23:51-62. Kahn discloses that the production sites are unique, disclosing separate control systems for designated locations. *See, e.g.*, Ex. 1005, 16:40-18:52. For example, Sensor unit 110 can be located at any desired point in a fluid distribution system. *See, e.g.*, Ex. 1005, 11:2-15.

50. A POSITA would recognize that Kahn discloses the addresses for facilities accessible by the network, as well as the monitoring and control equipment as recited in the '871 Patent. *See, e.g.*, Ex. 1005, 10:62-67; *see also id.*, 14:35-15:2 ("one or more actuators"), 15:62-16:32 (describing an actuator for each sensor 111). Therefore, Kahn discloses this limitation of the '871 Patent.

[18.5] - obtaining, with one or more processors implementing a facility-interface module or modules, data from the sensors at the facilities and send commands to the actuators at the facilities via the network connections; and

51. Kahn discloses that sensor unit 110 includes communication equipment with actuators configured to manipulate fluid flow at respective fluid-handling

facilities. *See, e.g.*, Ex. 1005, 10:62-67; *see also* Ex. 1005, 14:35-15:2, 15:62-16:32.

52. A POSITA would recognize that Kahn discloses obtaining data with a facility interface module, with a processor, data from the sensors at the facilities, and sending commands to the actuators at the facilities by the network connections as recited in the '871 Patent. *See, e.g.*, Ex. 1005, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3. Therefore, Kahn discloses this limitation of the '871 Patent

[18.6] - sending, with one or more processors implementing a user-interface module or modules, respective instructions to present respective control interfaces on respective user-computing devices logged in to respective ones of the accounts and to receive respective commands to control respective actuators from the respective user computing devices;

53. A GUI is a form of user interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary notation. In many applications, GUIs are used instead of text-based UIs, which are based on typed command labels or text navigation. GUIs were introduced in reaction to the perceived steep learning curve of command-line interfaces (CLIs), which require commands to be typed on a computer keyboard. *See* <https://www.computerhope.com/jargon/g/gui.htm>, *see also* <https://www.computerhope.com/issues/ch000619.htm>. A GUI is a type of user interface that allows a user to interact with fluid-handling devices via visual

indication representatives. It is well known that a GUI is a type of control interface.

54. A POSITA would recognize that Kahn discloses the control interfaces on a user computer device sending commands to control fluid handling system actuators, as recited in the '871 Patent. Ex. 1005, Abstract, 1:28-36, 2:50-3:2, 25:5-25, 25:48-26:19, 28:8-25, 29:5-37. Kahn further discloses that sensor unit 110 includes communication equipment with actuators configured to manipulate fluid flow at respective fluid-handling facilities, and to facilitate the measurement of data requested through the graphical user interface. *See, e.g.*, Ex. 1005, 10:62-67; *see also* Ex. 1005, 14:35-15:2, 15:62-16:32.

55. Therefore, Kahn discloses this limitation of the '871 Patent.

[18.7] - receiving, with the user-interface module or modules, a user command to actuate an actuator entered via a presented control interface;

56. A POSITA would recognize from the disclosure of Kahn that a user activates the actuator to achieve the disclosed action. Ex. 1005, Abstract, 1:28-36, 2:50-3:2, 25:5-25, 25:48-26:19, 28:8-25, 29:5-37. Thus, a POSITA would recognize that Kahn discloses receiving with the user interface module a user command to actuate an actuator of the fluid handling system, as recited in the '871 Patent. *See, e.g.*, Ex. 1005, 10:62-67; *see also* Ex. 1005, 14:35-15:2, 15:62-16:32. Therefore, Kahn discloses this limitation of the '871 Patent

[18.8] - identifying, with one or more processors, in response to the user command, an address in the datastore

corresponding to a facility at which the actuator is located; and

57. Kahn discloses a system that includes a remote computing system with a processor displaying a graphical user interface (GUI) showing data from the system's sensors. Ex. 1005, Abstract, 1:28-36, 2:50-3:2, 25:5-25, 25:48-26:19, 28:8-25, 29:5-37. Kahn further discloses that sensor unit 110 includes communication equipment with actuators configured to manipulate fluid flow at respective fluid-handling facilities, to facilitate the measurement of data requested through the graphical user interface. *See, e.g.*, Ex. 1005, 10:62-67; *see also id.*, 14:35-15:2, 15:62-16:32.

58. Kahn discloses that the production sites are unique, disclosing separate control systems for designated facility locations. *See, e.g.*, Ex. 1005, 16:40-18:52. A POSITA would recognize that Kahn discloses identifying an address in the datastore corresponding to the facility at which the actuator is located, as recited in the '871 Patent because the disclosed GUI enables the user to control a designated component of the system. Therefore, Kahn discloses this limitation of the '871 Patent.

[18.9] - sending, with one or more processors, instructions with the facility-interface module or modules to the facility to actuate the actuator, wherein:

59. A POSITA would recognize that Kahn discloses sending instructions to the facility interface module to actuate the fluid handling system's actuator, as recited in the '871 Patent. *See, e.g.*, Ex. 1005, 10:62-67; *see also* Ex. 1005, 14:35-

15:2, 15:62-16:32. Therefore, Kahn discloses this limitation of the '871 Patent.

[18.10] - the plurality of accounts include a first account, a second account, a third account, and a fourth account;

60. Kahn discloses a plurality of accounts, i.e., geographically distributed facilities for the transport of fluids, as shown above for element 18.3 and incorporated herein.

61. Kahn discloses an “authorized account A” for “a first entity” “to access aspects of first fluid test data.” Ex. 1005, 25:48-26:67. Kahn further discloses an “authorized account B” for “a second entity” “to access aspects of second fluid test data.” *Id.* The “first and second entities can control access to data generated by their respective sensors.” *Id.* Thus, “separate entities provide their fluid test data to the computer system 4 controlled by the service provider (an entity different from the first and second entities), and the first and second entities can control access to data generated by their respective sensors.” *Id.* Entities also “grant authorization to visualize [data] generated by them to others beyond themselves, such as government health organizations or security organizations such as the Department of Homeland Security.” *Id.*

62. A POSITA would recognize that Kahn discloses a plurality of accounts, as recited in the '871 Patent. Therefore, Kahn discloses this limitation of the '871 Patent.

[18.11] - the first account corresponds to a first group of fluid-handling facilities, one or more users of the first account being authorized to send commands to remotely control fluid handling devices at the first group of fluid-handling facilities;

63. A POSITA would recognize that Kahn discloses a plurality of accounts with varying degrees of access to designated systems, wherein a first group (authorized account A) has access to control a first group of fluid handling facilities, as recited in the '871 Patent. Ex. 1005, 25:48-26:67, *see also* Ex. 1005, 2:50-60, 19:58-65, 21:50-22:44, 22:62-23:50, 24:44-25:2, 25:5-12, 27:39-28:7. Therefore, Kahn discloses this limitation of the '871 Patent

[18.12] - the second account corresponds to a second group of fluid-handling facilities, the first group being different from the second group, one or more users of the second account being authorized to send commands to remotely control fluid handling devices at the second group of fluid-handling facilities;

64. A POSITA would recognize that Kahn discloses a plurality of accounts with varying degrees of access to designated systems, wherein a second group (authorized account B) has access to control a second group of fluid handling facilities, as recited in the '871 Patent. Ex. 1005, 25:48-26:67, *see also* Ex. 1005, 2:50-60, 19:58-65, 21:50-22:44, 22:62-23:50, 24:44-25:2, 25:5-12, 27:39-28:7. Therefore, Kahn discloses this limitation of the '871 Patent.

[18.13] - the third account corresponds to the first group of fluid-handling facilities, one or more users of the of the third account being authorized to view reports of data

from fluid handling devices at the first group of fluid-handling facilities; and

65. A POSITA would recognize that Kahn discloses a plurality of accounts with varying degrees of access to designated systems, wherein a third group (service provider) has access to view data from a first group of fluid handling facilities, as recited in the '871 Patent. Ex. 1005, 25:48-26:67, *see also id.*, 2:50-60, 19:58-65, 21:50-22:44, 22:62-23:50, 24:44-25:2, 25:5-12, 27:39-28:7.

66. Therefore, Kahn discloses this limitation of the '871 Patent.

[18.14] - the fourth account corresponds to the second group of fluid-handling facilities, one or more users of the of the fourth account being authorized to view reports of data from fluid handling devices at the second group of fluid-handling facilities

67. A POSITA would recognize that Kahn discloses a plurality of accounts with varying degrees of access to designated systems, wherein a fourth group (government health or security organizations such as the Department of Homeland Security) has access to view data from a second group of fluid handling facilities, as recited in the '871 Patent. Ex. 1005, 25:48-26:67, *see also* Ex. 1005, 2:50-60, 19:58-65, 21:50-22:44, 22:62-23:50, 24:44-25:2, 25:5-12, 27:39-28:7. Therefore, Kahn discloses this limitation of the '871 Patent. As such, Claim 18 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

b. Claim 22

[22.1] - The method of claim 18, wherein: the user-interface module or modules comprises a web server; and

68. A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web. A web server displays website content through storing, processing, and delivering web pages to users. Besides HTTP, web servers also support SMTP (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol), used for email, file transfer, and storage.

69. Web server hardware is connected to the internet and allows data to be exchanged with other connected devices, while web server software controls how a user accesses hosted files. The web server process is an example of the client/server model. See <https://www.techtarget.com/whatis/definition/Web-server>.

70. A POSITA would recognize that Kahn discloses the user-interface module or modules comprises a web server, as recited in the '871 Patent because the recited centralized data collection points operate as a server. Ex. 1005, Abstract, 1:28-36, 2:50-3:2, 25:5-25, 25:48-26:19, 28:8-25, 29:5-37; see also Ex. 1005, 10:54-56, 23:29-30. Therefore, Kahn discloses this limitation of the '871 Patent.

[22.2] - the facility-interface module or modules comprises a site server distinct from the web server;

71. Kahn discloses a system with Sensor unit 110 that connects via a

network to centralized data collection points. *See, e.g.*, Ex. 1005, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3. Kahn further discloses that the network of sensor units 110 can be configured to communicate with a central communication device, e.g., a server, and/or sensor unit 110 can communicate with each other as a distributed network. Ex. 1005, 10:54-56.

72. A POSITA would recognize that Kahn discloses the facility-interface module or modules comprises a web server, as recited in the '871 Patent because sensor unit 110 can communicate with each other in a distributed network with each sensor unit 110 operating as a server. Therefore, Kahn discloses this limitation of the '871 Patent.

[22.3] - the web server is configured to communicate with user devices via a first network port of a computing device executing the web server;

73. A POSITA would recognize that Kahn discloses web server is configured to communicate with user devices via a first network port of a computing device executing the web server, as recited in the '871 Patent, because Kahn discloses that the server communicates using communication components known in the art that would include a first network port. Ex. 1005, 10:54-56, 23:29-30. Therefore, Kahn discloses this limitation of the '871 Patent.

[22.4] - the site server is configured to communicate with facilities via a second network port of the computing

device, the second network port being different from the first network port; and

74. A POSITA would recognize that Kahn discloses site server configured to communicate via a second network port, as recited in the '871 Patent because Kahn discloses that sensor units 110 communicate using communication components known in the art that would include a second network port. Ex. 1005, 10:54-56, 23:29-30. Therefore, Kahn discloses this limitation of the '871 Patent.

[22.5] - the data store is configured to store subscription information associated with at least some of the accounts.

75. A POSITA would recognize that Kahn discloses the data store is configured to store subscription information associated with at least some of the accounts, as recited in the '871 Patent Ex. 1005, 22:12-44. Therefore, Kahn discloses this limitation of the '871 Patent. Therefore, a POSITA would understand that Kahn discloses the elements recited in Claim 22. As such, Claim 22 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

c. Claim 23

[23.1] - The method of claim 18, comprising: steps for interfacing with a plurality of site controllers associated with the facilities; and

76. A POSITA would recognize that Kahn discloses steps for interfacing with a plurality of site controllers associated with the facilities, as recited in the '871 Patent because sensor unit 110 can communicate with each other in a distributed

network with each sensor unit 110. *See, e.g.*, Ex. 1005, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3. Therefore, Kahn discloses this limitation of the '871 Patent.

[23.2] - steps for sending instructions to present a control interface on the user devices.

77. A POSITA would recognize that Kahn discloses steps for sending instructions to present a control interface on the user devices, as recited in the '871 Patent. Ex. 1005, Abstract, 1:28-36, 2:50-3:2, 25:5-25, 25:48-26:19, 28:8-25, 29:5-37. Therefore, Kahn discloses this limitation of the '871 Patent. Therefore, a POSITA would understand that Kahn discloses the elements recited in Claim 23. As such, Claim 23 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

d. Claim 25

[25] - The method of claim 18, wherein the facility-interface module or modules are configured to send pull requests to facilities to retrieve data buffered at the facilities.

78. A POSITA would recognize that Kahn discloses the facility-interface module or modules are configured to send pull requests to facilities to retrieve data buffered at the facilities because data will be transferred when requested by a user, as recited in the '871 Patent. *See, e.g.*, Ex. 1005, 10:62-67; *see also* Ex. 1005, 14:35-15:2, 15:62-16:32.

79. As such, Claim 25 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

e. Claim 26

80. Claim 26 depends from independent Claim 18. Kahn discloses Claim 18 for the reasons discussed above and incorporated herein.

81. A POSITA would recognize that Kahn discloses software applications written or described in any appropriate computer language including HTML, Java, and XML, among others. Ex. 1005, 28:8-26, *see also id.*, 33:31-43.

82. A POSITA would recognize that Kahn inherently discloses instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java. Ex. 1001, 3:61-62, 8:31-48.

[26.1] - The method of claim 18, comprising instantiating at least three of the following as distinct threads from one another:

83. A POSITA would recognize that Kahn inherently discloses instantiation of threads, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent.

[26.2] - a thread configured to sends and receive data requests;

84. Kahn discloses a data collection network with centralized data

collection points. *See, e.g.*, Ex. 1006, 8:51-59, 9:53-58, 17:18-30, 18:48-52, 63-65, 19:5-23, 19:58-65, 23:27-31.

85. A POSITA would recognize that Kahn inherently discloses a thread configured to send and receive data requests, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent.

[26.3] - a thread configured to synchronize other threads with updated information;

86. A POSITA would recognize that Kahn inherently discloses a thread configured to synchronize other threads with updated information, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent.

[26.4] - a thread configured to set a target state of actuators;

87. Kahn discloses that sensor unit 110 includes communication equipment with actuators configured to manipulate fluid flow by setting a target state for actuators at respective fluid-handling facilities. *See, e.g.*, Ex. 1006, 8:3-11, 8:21-24, 10:62-67; see also Ex. 1006, 14:35-15:2, 15:62-16:32, 34:7-12.

88. A POSITA would recognize that Kahn inherently discloses a thread

configured to set a target state of actuators, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent

[26.5] - a thread configured to obtain updated sensor readings;

89. Kahn discloses a data collection network with centralized data collection points. *See, e.g.*, Ex. 1006, 8:51-59, 9:53-58, 17:18-30, 18:48-52, 63-65, 19:5-23, 19:58-65, 23:27-31. Kahn discloses that the centralized data collection points receive sensor information via a network from a facility interface module, sensor unit 110. *See, e.g.*, Ex. 1006, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3.

90. A POSITA would recognize that Kahn inherently discloses a thread configured to obtain updated sensor readings, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent.

*[26.6] - a thread configured to process user interactions;
and*

91. Kahn discloses a system that includes a remote computing system with a processor displaying a graphical user interface (GUI) showing data from the

system's sensors. Ex. 1006, Abstract, 1:28-36, 2:50-3:2, 25:5-25, 25:48-26:19, 28:8-25, 29:5-37.

92. A POSITA would recognize that Kahn inherently discloses a thread configured to process user interactions, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent.

[26.7] - a thread that eliminates other threads upon detecting a problem with the eliminated threads.

93. A POSITA would recognize that Kahn inherently discloses a thread that eliminates other threads upon detecting a problem with the eliminated threads, as recited in the '871 Patent, from its disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent. Therefore, a POSITA would understand that Kahn discloses the elements recited in Claim 26. As such, Claim 26 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn

f. Claim 27

[27.1] - The method of claim 18, comprising instantiating each and every of the following as distinct threads from one another:

94. A POSITA would recognize that Kahn inherently discloses a thread configured to obtain updated sensor readings, as recited in the '871 Patent, from its

disclosure of software or applications written in then-current computer languages, including Java. Ex. 1001, 3:61-62; 8:31-48. Therefore, Kahn discloses this limitation of the '871 Patent.

95. Kahn inherently discloses instantiating each and every of the following as distinct threads from one another, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26, and incorporated herein.

[27.2] - a thread configured to sends or receive data request;

96. Kahn inherently discloses a thread configured to sends or receive data request, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26, and incorporated herein.

[27.3] - a thread configured to synchronize other threads with updated information;

97. Kahn inherently discloses a thread configured to synchronize other threads with updated information, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26 and incorporated herein.

[27.4] - a thread configured to set a target state of actuators;

98. Kahn inherently discloses a thread configured to set a target state of actuators, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26, and incorporated herein.

[27.5] - a thread configured to obtain updated sensor

readings;

99. Kahn inherently discloses a thread configured to obtain updated sensor readings, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26 and incorporated herein.

*[27.6] - a thread configured to process user interactions;
and*

100. Kahn inherently discloses a thread configured to process user interactions, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26 and incorporated herein.

*[27.7] - a thread that eliminates other threads upon
detecting a problem with the eliminated threads.*

101. Kahn inherently discloses a thread that eliminates other threads upon detecting a problem with the eliminated threads, or this limitation would be obvious to a POSITA in view of Kahn, as discussed above for Claim 26, and incorporated herein. Therefore, a POSITA would understand that Kahn discloses the elements recited in Claim 27. As such, Claim 27 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn

g. Claim 28

*[28] - The method of claim 18, comprising:
communicating, with a controller at one of the facilities,
with an actuator or a sensor to actuate the actuator or
read from the sensor.*

102. A POSITA would recognize that Kahn discloses communicating, with

a controller at one of the facilities, with an actuator or a sensor to actuate the actuator or read from the sensor, as recited in the '871 Patent. *See, e.g.*, Ex. 1005, 10:62-67; *see also* Ex. 1005, 14:35-15:2, 15:62-16:32. As such, Claim 28 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

h. Claim 29

[29] - The method of claim 28, wherein the controller is communicatively coupled to the actuator and the sensor via a private local area network, and wherein controller is communicatively coupled to the actuator or sensor via a frame-based carrier-sense multiple access protocol with collision detection.

103. For the controller to communicate with each device, the protocol of the device must be translated to a protocol that can be understood by the CPU and the other devices at the well site. A protocol translator is often disposed at the well site to translate protocols. *See, e.g.*, <https://www.trendmicro.com/vinfo/hk-en/security/definition/protocol-gateway>.

104. Protocol translation is a method for transforming pieces of information from a source protocol into relevant target protocol formats to communicate between heterogeneous legacy systems in interoperability environments, such as fluid-handling sites. *See* <https://www.sciencedirect.com/science/article/abs/pii/S0164121212001720#:~:text=Protocol%20translation%20is%20a%20method,legacy%20systems%20in%20interoperability%20environments>. A protocol translator is a device used to convert

standard or proprietary protocol of one device to the protocol suitable for the other device or tools to achieve the desired interoperability. Protocols are software installed on the routers, which convert the data formats, data rate, and protocols of one network into the protocols of the network in which data is navigating. There are varieties of protocols used in different fields like power generation, transmission and distribution, oil and gas, automation, utilities, and remote monitoring applications. The major protocol translation messages involve the conversion of data messages, events, commands, and time synchronization. Protocol converters are generally used for transforming data and commands from one device or application to another. This necessarily involves the transformation of data, commands, their representation, encoding, and framing to achieve the conversion. See <https://www.trendmicro.com/vinfo/hk-en/security/definition/protocol-gateway>

105. Translation of protocols is required to support communication between different fluid-handling devices, controllers, IPCs, etc. A POSITA would understand that the claimed translation of protocols is required to permit the data interface and bus to operate and communicate with various types of devices using multiple different types of protocols. <https://www.trendmicro.com/vinfo/hk-en/security/definition/protocol-gateway> Protocol translation allows devices running dissimilar protocols to communicate. The translation of virtual terminal protocols allows connectivity to devices running different protocol stacks. A POSITA would

understand that the claimed translation of protocols is required to permit the data interface and bus to operate and communicate with various types of devices using multiple different types of protocols.

106. Whenever a sender and receiver have a radical link to transmit data/information packets, the data link management handles the channel. Where there is no committed path to communicate the data between two devices with multiple access protocols, the channel transmits the information over the channel simultaneously. In this case, the simultaneously transmitted data will produce concussion and cross-talk. Therefore, multiple access protocols are needed to avoid data collision and disturbance within the channels.

107. An example implementation of using multiple access links and protocols in the context of the network link layer is a network that uses both wired and wireless connections to connect devices to the internet. In this network, different devices may have different types of network interfaces, such as Ethernet ports or Wi-Fi adapters. *See, e.g.*, <https://www.javatpoint.com/multiple-access-protocols>.

108. The network link layer protocol would need to support multiple access links and protocols to manage the different types of network interfaces and ensure efficient data transmission. For instance, in a wired Ethernet network, devices are connected to a switch, and the switch uses the Ethernet protocol to manage data transmission between devices. On the other hand, in a wireless network, devices

communicate with an access point, and the access point uses the Wi-Fi protocol to manage data transmission. See, e.g.,

<https://www.sciencedirect.com/topics/engineering/link-layer-protocol>

109. The network link layer protocol would need to support both Ethernet and Wi-Fi protocols and manage the different access links efficiently. This could be achieved using a protocol such as the IEEE 802.11 standard, which defines the protocol for wireless LANs, or the IEEE 802.3 standard, which defines the protocol for wired Ethernet LANs. In addition, the network link layer protocol would need to handle issues such as collisions, packet loss, and network congestion that can occur when multiple devices are accessing the network simultaneously. This could be accomplished using techniques such as carrier sense multiple access with collision detection (CSMA/CD) for wired networks or carrier sense multiple access with collision avoidance (CSMA/CA) for wireless networks. See, e.g., <https://www.sciencedirect.com/topics/engineering/link-layer-protocol>

110. Overall, the implementation of multiple access links and protocols in the network link layer is essential for managing the different types of network interfaces and ensuring efficient data transmission in a modern network that uses both wired and wireless connections.

111. The data link layer combines data bits into entities called frames. Network topologies like Ethernet exist at the data link layer. Network switches are

the most common data link layer devices.

112. A POSITA would recognize that Kahn discloses a frame-based carrier-sense multiple access protocol with collision detection because a POSITA would know that frame-based carrier-sense multiple access protocol with collision detection, as recited in the '871 Patent, is an Ethernet networking technology. Ex. 1005, 10:18-48, 19:34-57.

113. A POSITA would recognize that Kahn discloses communicating with a controller at one of the facilities to control and actuator or read from a sensor via a private local area network that uses a frame-based carrier-sense multiple access protocol with collision detection. As such, Claim 29 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

i. Claim 30

[30] - The method of claim 28, comprising buffering data from sensors with the controller and pushing, with the controller, buffered data to the facility-interface module or modules.

114. A data buffer is a reserved segment of memory (RAM) within a program that is used to hold the data being processed. Buffers are set up in every program to hold data coming in and going out. In a video streaming application, the program uses buffers to store an advance supply of video data to compensate for momentary delays. Applications may be able to allocate and deallocate buffers from the general memory pool. In a printer and other peripherals, fixed buffers provide

temporary storage for data passing through. See

<https://www.pcmag.com/encyclopedia/term/buffer>.

115. A POSITA would recognize that Kahn discloses buffering data from sensors with the controller and pushing, with the controller, buffered data to the facility-interface module or modules. Ex. 1005, 9:48-10:7. As such, Claim 30 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

j. Claim 31

[31] - The method of claim 28, comprising: steps for ensuring at least some data is not lost if network access ceases intermittently.

116. A POSITA would recognize that Kahn discloses steps for ensuring at least some data is not lost if network access ceases intermittently because sensor units 110 include data storage and allow for intermittent transmission of data. Ex. 1005, 19:24-33. As such, Claim 31 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

k. Claim 34

[34] - The method of claim 28, comprising: steps for mitigating shocks to up-stream or down-stream fluid-handling devices.

117. Kahn discloses detecting breakage of a pipe and the break's location through the system's sensors. Ex. 1005, 10:8-17, 19:16-23. Based on the identified condition, Kahn discloses activating a shut off valve to shut off the supply of fluid upon the detection of the emergency event. Ex. 1005, 10:62-11:5, 20:64-67.

118. A POSITA would recognize that Kahn discloses steps for mitigating shocks to up-stream or down-stream fluid-handling devices, as recited in the '871 Patent. Ex. 1005, 10:62-11:5, 20:64-67. As such, Claim 34 is anticipated by Kahn, or would be obvious to a POSITA in view of Kahn.

2. Ground 2: Gutierrez Anticipates Claims 18-21, 23, 25- 29, 31, 32, and 34, or such claims would be obvious in view of Gutierrez, or Gutierrez in view of Kahn.

119. Independent claim 18 and dependent claims 25-32 and 34 are anticipated by U.S. Patent 9,709,995 (“Gutierrez”) under 35 U.S.C. § 102 or would be obvious to a POSITA in view of Gutierrez under 35 U.S.C. § 103.

120. As a POSITA, I would be motivated to Gutierrez and Kahn. Combining Gutierrez and Kahn would have been obvious to a POSITA to try because both references describe similar systems for remote monitoring and control of fluid handling facilities.

121. A POSITA would have referred to Gutierrez for its teachings of a system for remote users to monitor and control fluid handling facilities. *See, e.g.*, Gutierrez at 1:14-50. More specifically, Gutierrez discloses a monitoring and control system for hydrocarbon production and transport, including waste water removal and separation. Gutierrez at 1:18-50.

122. A POSITA understands that the pipelines and transport systems of Gutierrez necessarily involve multiple operators and sites geographically dispersed

because they relate to the transport of fluids. Each different operator and site must work together for the efficient and safe operation of the disclosed fluid handling/transport systems.

123. A POSITA would understand that users and operators require remote access to both data and control of fluid handling systems. A POSITA would further understand that supervisors, regulators, and other relevant parties require access to data from the fluid handling/transport systems. Thus, different levels of access to data or control of the fluid handling systems would be expected by a POSITA.

124. Gutierrez discloses that the network used to communicate in the disclosed systems and methods is an enterprise or secured network. Ex. 1006, 12:48-59. A POSITA would understand that an enterprise or secured network would involve users/operators having individual logins and passwords, and each user/operator would only have access to designated data and control systems based on their individualized duty requirements.

125. A POSITA would then have referred to Kahn for its detailed disclosure of specific user differentiation features for fluid handling facilities, with different users having specified access only to designated data or controls. Ex. 1005, 25:48-26:67, *see also* 2:50-60, 19:58-65, 21:50-22:44, 22:62-23:50, 24:44-25:2, 25:5-12, 27:39-28:7.

126. A POSITA would have been motivated to combine Gutierrez and Kahn

because Kahn provides additional detailed disclosure regarding user differentiation, which a POSITA would implement as a standard security practice in any remote systems having multiple facilities and users, such as the system/method disclosed by Gutierrez. Differentiating the access allowed to different users, and limiting users' access to only designated facilities and functions, would motivate a POSITA to combine Gutierrez and Kahn to achieve the security, efficiency, and safety benefits limiting access to only designated data or control mechanisms provides across any enterprise or secured network.

127. Combining Gutierrez and Kahn would lead to predictable results of users of the systems and methods of Gutierrez having predetermined levels of access to view data or control only designated systems.

128. A POSITA would not have difficulty combining Gutierrez and Kahn, because Gutierrez and Kahn do not describe alternative systems or methods, but rather the disclosure of Kahn provides additional detail on user differentiated access, rather than a different approach to solving problems in the underlying technology.

a. Claim 18

[18.1] - A method, comprising:

129. A POSITA would understand that Gutierrez discloses a method. *See, e.g.,* Ex. 1006, 1:54-2:8, 5:32-36, Claims 1-8.

[18.2] - storing, with one or more processors, records comprising:

130. A POSITA would understand that controller 130 in Gutierrez includes a processor and data storage for records related to hydrocarbon production facilities.

131. A POSITA would understand that Gutierrez discloses that chemical injection system 100 may be utilized in a hydrocarbon production system, such as, for example, a field or area having one or more hydrocarbon (e.g., oil, natural gas) production sites. Ex. 1006, 6:55-7:2. A POSITA would understand that Gutierrez discloses that chemical injection system 100 includes a pump 105 mechanically coupled to a driver, such as a motor 110; a motor controller 115; and a controller 130. Ex. 1006, 6:46-49.

132. A POSITA would understand that Gutierrez discloses that controller 130 provides “microprocessor-based” control of the motor controller 115 and thus motor 110 and pump 105. Ex. 1006, 8:15-19. A POSITA would understand that Gutierrez also discloses that Controller 130 includes a communication module 140, including data acquisition, data storage, and a processor 150. Ex. 1006, 8:19-21; *see also id.*, 8:39-9:3.

133. Therefore, A POSITA would understand that Gutierrez discloses microprocessor-based Controller 130 that stores data, i.e. records.

[18.3] - a plurality of accounts, each account corresponding to an entity operating one or more geographically distributed fluid-handling facilities, the

accounts associating different fluid-handling facilities with different entities; and

134. A POSITA would understand that Gutierrez discloses a plurality of accounts, namely one or more geographically distributed fluid-handling facilities, including associating different fluid-handling facilities with different entities. Ex. 1006, 6:55-7:2; *see also id.*, 5:22-26; 6:24-27; 10:22-38.

135. A POSITA would understand that Gutierrez discloses chemical injection system 100 in a hydrocarbon production system, such as, for example, a field or area having one or more hydrocarbon (e.g., oil, natural gas) production sites. *Id.*

136. A POSITA would understand that Gutierrez discloses that the production sites are unique, disclosing control systems for “each.” Ex. 1006, 6:28-35; 10:22-24, 10:34-38, 10:43-59 (“data may be wirelessly transmitted directly to each chemical injection system . . . some or all of the processing of data and command generation may occur at the remote control center 220 rather than each individual chemical injection system 220.”), 11:55-61 (“each computer 305 may monitor, receive data from, and/or generate commands transmitted to a single chemical injection system 310 or multiple chemical injection systems 310.”), 11:62-12:3, 13:10-26 (“a user or operator may utilize the GUI 315 to control one or more components of the chemical injection system 310”); Claim 1.

137. A POSITA would understand that Gutierrez discloses a hydrocarbon

transmission system including one or more chemical injection systems for relative distances between production sites and pipeline monitoring locations in order to efficiently inject chemical additives into the system without waste. Ex. 1006, 5:22-31; *see also* Ex. 1006, 3:49-4:4, 4:50-63, 6:24-44 (“a hydrocarbon transmission system includes a pipeline adapted to enclose a fluid transmitted from a plurality of hydrocarbon production sites to a processing site and a plurality of chemical injection systems”), 6:45-58, 10:22-24 (“System 200 includes one or more hydrocarbon production sites 215, each of which is fluidly coupled to a pipeline 205.”), 11:37-42.

138. A POSITA would understand that the multiple types of disclosed fluid handling facilities disclosed in Gutierrez, including production sites and pipeline monitoring locations, would necessarily be geographically distributed.

139. A POSITA would understand from the disclosure of Gutierrez that the disclosed geographically distributed accounts associate fluid-handling facilities from different entities because Gutierrez discloses systems with multiple types of fluid-handling facilities that would necessarily be geographically distributed. A POSITA would recognize that different entities maintain different types of facilities, such as pipelines vs. processing facilities, and different entities operate in different geographic areas. Thus, from the disclosure of Gutierrez, a POSITA would understand that the disclosed system associates different fluid-handling facilities

with different entities.

140. Therefore, A POSITA would understand that Gutierrez discloses the plurality of accounts recited in the '871 Patent.

[18.4] - addresses by which industrial monitoring or control equipment at the facilities is accessible via network connections, the monitoring or control equipment including sensors configured to measure fluid handled at respective fluid-handling facilities and actuators configured to manipulate fluid flow at respective fluid-handling facilities, at least some of the fluid-handling facilities including both a plurality of the sensors and a plurality of the actuators;

141. A POSITA would recognize that Gutierrez discloses the addresses for facilities and the monitoring and control equipment as recited in the '871 Patent. See, e.g., Ex. 1006, 6:45-8:38 (describing chemical injection system with controllers for activating pumps to manipulate fluid flow), 9:54-10:16, 11:62-12:29, 13:23-26. Therefore, Gutierrez discloses this limitation of the '871 Patent.

[18.5] - obtaining, with one or more processors implementing a facility-interface module or modules, data from the sensors at the facilities and send commands to the actuators at the facilities via the network connections; and

142. A POSITA would recognize that Gutierrez discloses obtaining data with a facility interface module, with a processor, data from the sensors at the facilities, and sending commands to the actuators at the facilities by the network connections as recited in the '871 Patent. Gutierrez discloses fluid-handling facilities with computers or controllers that take data from sensors and send

commands to actuators. Ex. 1006, 6:45-7:2, 8:16-38 (“controller 130 includes a communication module 140 . . . and a processor 150 . . . controller 130 receives inputs and/or instructions and commands from a remote source and, according to the commands, controls the operation and/or speed of the motor 110 and pump 105 to inject chemicals into the pipeline 120 . . . [and] receive[s] data representative of pipeline conditions, such as line pressure, amount of chemicals present in the pipeline 120, and motor operating conditions”), 9:65-10:16, 10:17-11:4, 11:16-33, 11:55-61 (“each computer 305 may monitor, receive data from, and/or generate commands transmitted to a single chemical injection system 310 or multiple chemical injection systems 310”), 13:9-26.

143. Therefore, Gutierrez discloses this limitation of the ’871 Patent.

[18.6] - sending, with one or more processors implementing a user-interface module or modules, respective instructions to present respective control interfaces on respective user-computing devices logged in to respective ones of the accounts and to receive respective commands to control respective actuators from the respective user computing devices;

144. A POSITA would recognize that Gutierrez discloses the control interfaces on a user computer device sending commands to control fluid handling system actuators, as recited in the ’871 Patent. Gutierrez discloses user computing device that interfaces with the fluid handling system to send instructions to control actuators of the fluid handling system. Ex. 1006, 11:16-33 (“the system 300 includes

a computer 305 displaying a graphical user interface (GUI) 315, one or more remote chemical injection systems 310”), 13:9-26 (“a user or operator may utilize the GUI 315 to control one or more components of the chemical injection system 310 based on data received from the system 310 and displayed on the GUI 315.

145. Therefore, Gutierrez discloses this limitation of the ’871 Patent.

[18.7] - receiving, with the user-interface module or modules, a user command to actuate an actuator entered via a presented control interface;

146. A POSITA would recognize that Gutierrez discloses receiving with the user interface module a user command to actuate an actuator of the fluid handling system, as recited in the ’871 Patent. Gutierrez discloses a graphical user interface that receives the commands and sends them to the fluid handling system. Ex. 1006, 11:16-33 (“the system 300 includes a computer 305 displaying a graphical user interface (GUI) 315, one or more remote chemical injection systems 310”), 13:9-26 (“a user or operator may utilize the GUI 315 to control one or more components of the chemical injection system 310 The computer 305 and/or a user operating the computer 305 may then issue commands to one or more of the chemical injection systems 310. Such commands may include a command to stop injecting chemical additive into the pipeline and/or a command to inject a specified amount of chemical additive into the pipeline.”). Therefore, Gutierrez discloses this limitation of the ’871 Patent.

[18.8] - identifying, with one or more processors, in response to the user command, an address in the datastore corresponding to a facility at which the actuator is located; and

147. A POSITA would recognize that Gutierrez discloses identifying an address in the datastore corresponding to the facility at which the actuator is located, as recited in the '871 Patent because the disclosed GUI enables the user to control “each” component of the chemical injection system. Gutierrez discloses a graphical user interface that receives the commands and sends them to the fluid handling system. Ex. 1006, 11:16-33 (“the system 300 includes a computer 305 displaying a graphical user interface (GUI) 315, one or more remote chemical injection systems 310”), 13:9-26.

148. Gutierrez discloses that the production sites are unique, disclosing separately addressed controls for “each individual” system. Ex. 1006, 6:28-35; 10:22-24, 10:34-38, 10:43-59 (“data may be wirelessly transmitted directly to each chemical injection system . . . some or all of the processing of data and command generation may occur at the remote control center 220 rather than each individual chemical injection system 220.”), 11:55-61 (“each computer 305 may monitor, receive data from, and/or generate commands transmitted to a single chemical injection system 310 or multiple chemical injection systems 310.”), 11:62-12:3, 13:10-26; Claim 1. Therefore, Gutierrez discloses this limitation of the '871 Patent.

[18.9] - sending, with one or more processors, instructions with the facility-interface module or modules to the facility to actuate the actuator, wherein:

149. A POSITA would recognize that Gutierrez discloses sending instructions to the facility interface module to actuate the fluid handling system's actuator, as recited in the '871 Patent. Gutierrez discloses user computing device interfaces with the fluid handling system to send instructions to control the actuators of the fluid handling system. Ex. 1006, 11:16-33 ("the system 300 includes a computer 305 displaying a graphical user interface (GUI) 315, one or more remote chemical injection systems 310"), 13:9-26 ("a user or operator may utilize the GUI 315 to control one or more components of the chemical injection system 310 . . . a user operating the computer 305 may then issue commands to one or more of the chemical injection systems 310. Such commands may include a command to stop injecting chemical additive into the pipeline and/or a command to inject a specified amount of chemical additive into the pipeline.").

150. Therefore, Gutierrez discloses this limitation of the '871 Patent.

[18.10] - the plurality of accounts include a first account, a second account, a third account, and a fourth account;

151. Gutierrez inherently discloses a plurality of accounts, or this limitation would be obvious to a POSITA in view of Gutierrez.

152. Kahn in view of Gutierrez renders obvious the disclosed plurality of accounts. Additionally, Gutierrez discloses that its subject conduit systems carry

and/or transport one or more fluids to insert other fluids (e.g., additives, inhibitors, or otherwise) into the conduit system, the carried fluids include hydrocarbon systems that transport hydrocarbon fluids, such as oil and/or gas or other fluids. Ex. 1006, 1:18-26.

153. A POSITA would recognize that Gutierrez inherently discloses that the described systems will require multiple systems and operational components to transport fluids through the described conduit system, geographically distributed across the distance for monitoring and controlling fluids transported through the pipeline.

154. A POSITA would recognize that Gutierrez inherently discloses a plurality of accounts, as recited in the '871 Patent. Ex. 1006, 5:22-31; *see also id.*, 3:49-4:4, 4:50-63, 6:24-44 (“a hydrocarbon transmission system includes a pipeline adapted to enclose a fluid transmitted from a plurality of hydrocarbon production sites to a processing site and a plurality of chemical injection systems”), 6:45-58, 10:22-24 (“System 200 includes one or more hydrocarbon production sites 215, each of which is fluidly coupled to a pipeline 205.”), and 11:37-42.

155. As described above and incorporated by reference herein, a POSITA would also be motivated to combine the disclosure of Kahn, discussed below in Ground 2 for elements 18.10-18.14 and incorporated into each by reference herein, to provide specific details of multiple facility and user management to the general

disclosures of Gutierrez.

156. A POSITA would recognize that Gutierrez's disclosure of geographically distributed and multiple types of operational components discloses multiple fluid handling facilities.

157. A POSITA would recognize that Gutierrez inherently discloses a plurality of accounts, as recited in the '871 Patent. Therefore, Gutierrez discloses this limitation of the '871 Patent.

158. Thus, Gutierrez in combination with Kahn renders obvious the plurality of accounts recited in the '871 Patent.

[18.11] - the first account corresponds to a first group of fluid-handling facilities, one or more users of the first account being authorized to send commands to remotely control fluid-handling devices at the first group of fluid-handling facilities;

159. Gutierrez inherently discloses a plurality of accounts with a group of that plurality of accounts authorized to remotely control fluid handling devices, or this limitation would be obvious to a POSITA in view of Gutierrez.

160. A POSITA would recognize that the disclosure in Gutierrez matches the relevant disclosure in the '871 Patent. The relevant disclosure in the '871 Patent merely recites that in the data store 34 of some embodiments, the site master-controllers 16 may be organized according to user accounts, with each site master-controller 16 corresponding to at least one user account and some user accounts

corresponding to multiple site master-controllers 16, as some users may have, for example, a plurality of oil wells or other facilities which the user wishes to control or monitor . . . each account record having one or more user names, one or more user passwords, billing information (e.g., billing address, subscription price, and invoicing data), and identifiers of one or more site master-controllers. Ex. 1001, 4:24-39.

161. A POSITA would recognize that enterprise or secured networks require individual users to login, and then users receive access only to designated systems, e.g. access to control a designated group of devices.

162. A POSITA would recognize that Gutierrez inherently discloses a plurality of accounts including accounts in a first group with access permitted for control of a first designated group of devices, as recited in the '871 Patent. Therefore, Gutierrez discloses this limitation of the '871 Patent.

[18.12] - the second account corresponds to a second group of fluid-handling facilities, the first group being different from the second group, one or more users of the second account being authorized to send commands to remotely control fluid-handling devices at the second group of fluid-handling facilities;

163. Gutierrez inherently discloses a plurality of accounts with a group of that plurality of accounts authorized to remotely control fluid handling devices, or this limitation would be obvious to a POSITA in view of Gutierrez. *See supra*, ¶ 160.

164. A POSITA would recognize that Kahn and Gutierrez both disclose

secure systems where users only have designated access to authorized data or system controls. Ex. 1006, 12:48-59.

165. As discussed above for limitation 18.11 and incorporated herein, a POSITA would recognize that Gutierrez inherently discloses a plurality of accounts including accounts in a second group with access permitted for control of a second designated group of devices, as recited in the '871 Patent. Therefore, Gutierrez discloses this limitation of the '871 Patent.

[18.13] - the third account corresponds to the first group of fluid-handling facilities, one or more users of the of the third account being authorized to view reports of data from fluid handling devices at the first group of fluid-handling facilities; and

166. Gutierrez inherently discloses a plurality of accounts with a group of that plurality of accounts authorized to remotely view data reports from designated fluid handling devices, or this limitation would be obvious to a POSITA in view of Gutierrez.

167. Gutierrez discloses that the network used to communicate in the disclosed methods is an enterprise or secured network. Ex. 1005, 12:48-59. A POSITA would recognize that enterprise or secured networks require individual users to login, and then users receive access only to designated systems, e.g. access to view data reports for a designated group of devices. As discussed above for limitation 18.11 and incorporated herein, a POSITA would recognize that the

disclosure in Gutierrez matches the relevant disclosure in the '871 Patent.

168. A POSITA would further recognize that Gutierrez inherently discloses a plurality of accounts including accounts in a third group permitted access to view data reports for a first designated group of devices, as recited in the '871 Patent. Therefore, Gutierrez discloses this limitation of the '871 Patent.

169. Kahn in view of Gutierrez renders obvious the disclosed plurality of accounts with a third group of that plurality of accounts authorized to remotely view data reports from designated first fluid handling devices.

170. Gutierrez discloses users remotely viewing data from designated fluid handling devices. For example, Gutierrez discloses monitoring and control equipment including sensors configured to measure fluid handled at respective fluid-handling facilities. Ex. 1006, 9:4-13 (“one or more electronic sensors monitoring the pipeline”); 9:21-25 (“wireless sensors may detect various operations parameters of the pipeline 120, such as line pressure and/or chemical concentrate”), 10:7-16 (“a wireless pressure sensor”), 10:40-46, 13:12-17.

171. Gutierrez discloses that the network used to communicate in the disclosed methods is an enterprise or secured network. Ex. 1006, 12:48-59.

172. A POSITA would recognize that enterprise or secured networks require individual users to login, and then users receive access only to designated systems, e.g. access to view data reports for a designated group of devices. A POSITA would

recognize that the disclosure in Gutierrez matches the relevant disclosure in the '871 Patent.

173. A POSITA would recognize that Kahn and Gutierrez both disclose secure systems where users only have designated access to authorized data or system controls.

174. As discussed above for limitations 18.10-18.12 and incorporated herein, a POSITA would recognize that Kahn in view of Gutierrez renders obvious the disclosed plurality of accounts including accounts in a third group permitted access to view data reports for a first designated group of devices, as recited in the '871 Patent. Therefore, Gutierrez in combination with Kahn renders obvious this limitation of the '871 Patent

175. Gutierrez inherently discloses a plurality of accounts with a group of that plurality of accounts authorized to remotely view data reports from designated fluid handling devices, or this limitation would be obvious to a POSITA in view of Gutierrez.

- i.* [18.14] - the fourth account corresponds to the second group of fluid-handling facilities, one or more users of the of the fourth account being authorized to view reports of data from fluid handling devices at the second group of fluid-handling facilities

176. Gutierrez inherently discloses a plurality of accounts with a group of that plurality of accounts authorized to remotely view data reports from designated

fluid handling devices, or this limitation would be obvious to a POSITA in view of Gutierrez.

177. A POSITA would recognize that Gutierrez inherently discloses a plurality of accounts including accounts in a fourth group permitted access to view data reports for a second designated group of devices, as recited in the '871 Patent. Therefore, Gutierrez discloses this limitation of the '871 Patent.

178. As such, Claim 18 is anticipated by Gutierrez, or would be obvious to a POSITA in view of Gutierrez.

179. Kahn in view of Gutierrez renders obvious the disclosed plurality of accounts with a fourth group of that plurality of accounts authorized to remotely view data reports from a designated second fluid handling devices.

180. As discussed above for limitation 18.13 and incorporated herein, a POSITA would recognize that Kahn in view of Gutierrez renders obvious the disclosed plurality of accounts including accounts in a fourth group, as recited in the '871 Patent. Therefore, Gutierrez discloses this limitation of the '871 Patent.

181. A POSITA would recognize that Kahn and Gutierrez both disclose secure systems where users only have designated access to authorized data or system controls.

182. A POSITA would recognize that Kahn in view of Gutierrez renders obvious the disclosed plurality of accounts including accounts in a fourth group

permitted access to view data reports for a second designated group of devices, as recited in the '871 Patent. Therefore, Gutierrez in combination with Kahn renders obvious this limitation of the '871 Patent. As such, Claim 18 would be obvious to a POSITA over Kahn in view of Gutierrez.

b. Claim 19

[19.1] - The method of claim 18, wherein: at least some of the fluid-handling facilities are oil-or-gas related fluid-handling facilities and include petro-water disposal facilities or re-injection facilities; and

183. Claim 19 depends from independent Claim 18. Gutierrez discloses Claim 18 for the reasons discussed above and incorporated herein.

184. A POSITA would understand that the fluid handling facilities for hydrocarbon production systems include oil-or-gas related fluid-handling facilities, petro-water disposal facilities, and re-injection facilities. Ex. 1006, 6:55-7:2; *see also id.*, 1:18-32, 5:22-26; 6:24-27; 10:22-38.

[19.2] - the sensors include a level sensor of an oil/water separation tank at one of the facilities configured to indicate a level at which oil meets water, and wherein the datastore includes a record associating the tank with the facility.

185. Gutierrez discloses level sensors for chemical reservoirs. Ex. 1006, 12:65-13:8 (“the GUI 315 may display a level of a chemical reservoir at the chemical injection system 310; power capacity and/or availability of a pump motor at the chemical injection system 310; one or more pump or pump motor characteristics

(e.g., amps, current status, pressure, as well as other parameters)").

186. Gutierrez discloses sensor readings of fluidic pressure, fluidic storage level, and percentage of water content in the fluidic system. Ex. 1006, 13:27-49 ("One or more of GUIs 400, 410, 420, and 430 may be displayed on the computer 305 in place of or in addition to GUI 315. . . . GUI 400 provides information related to . . . fluidic pressure of fluid flowing through the pipeline and/or from chemical reservoir; fluidic storage level of the chemical reservoir; . . . and a percentage water content of fluid flowing through the pipeline.")

187. A POSITA would recognize that Gutierrez's disclosure of a level sensor of fluid in a reservoir, as well as information regarding the percentage of water in the fluidic system, would provide a fluid level indicator for the oil/water partition level within a particular storage tank within a facility, as recited in the '871 Patent.

188. A POSITA would recognize that Gutierrez discloses sensor readings associated with a specific facility sensor, such as on a tank within a given facility, as recited in the '871 Patent.

189. Therefore, a POSITA would understand that Gutierrez discloses the element recited in Claim 19. As such, Claim 19 is anticipated by Gutierrez, or would be obvious to a POSITA in view of Gutierrez.

c. Claim 20

[20.1] - The method of claim 18, wherein: the sensors include a tank level sensor of a tank at one of the facilities;

190. Gutierrez discloses level sensors for chemical reservoirs. Ex. 1006, 12:65-13:8 (“the GUI 315 may display a level of a chemical reservoir at the chemical injection system 310”).

191. Gutierrez discloses sensor readings of fluidic pressure and fluidic storage level. Ex. 1006, 13:27-49 (“One or more of GUIs 400, 410, 420, and 430 may be displayed on the computer 305 in place of or in addition to GUI 315. . . . GUI 400 provides information related to . . . fluidic pressure of fluid flowing through the pipeline and/or from chemical reservoir; fluidic storage level of the chemical reservoir”).

192. A POSITA would recognize that Gutierrez's disclosure of a level sensor of fluid in a reservoir would sense the level of fluid within a particular tank, as recited in the '871 Patent.

[20.2] - the datastore includes a record associating the tank with the facility, data from the tank being unavailable to users without an account associated with the tank; and

193. Kahn in view of Gutierrez renders obvious a plurality of accounts with a group of that plurality of accounts not authorized to retrieve data for designated fluid handling devices. As described above and incorporated by reference herein, a POSITA would be motivated to combine the disclosures of Kahn and Gutierrez for

elements 20.2 and 20.3 to provide specific details of multiple facility and user management—including denying access to unauthorized users—to the general disclosures of Gutierrez.

194. Kahn’s and Gutierrez’s disclosures, detailed above for elements 18.13 and 18.14, are incorporated herein by reference.

195. A POSITA would recognize that enterprise or secured networks require individual users to login, and then users receive access only to designated systems, e.g. access to data only from a designated group of devices.

196. A POSITA would recognize that the disclosure in Gutierrez matches the relevant disclosure in the ’871 Patent.

197. A POSITA would recognize that Kahn in view of Gutierrez renders obvious a plurality of accounts including accounts with access not permitted to retrieve data from a designated group of devices, as recited in the ’871 Patent.

[20.3] - the accounts designate a plurality of fluid-handling facilities to which a given user is authorized to send user commands to actuate actuators.

198. Kahn in view of Gutierrez renders obvious a plurality of accounts with a group of that plurality of accounts authorized to remotely control fluid handling devices.

199. As discussed above for limitation 18.11 and 18.12 and incorporated herein, a POSITA would recognize that Kahn in view of Gutierrez renders obvious

a plurality of accounts including accounts in a designated group with access permitted for control of a designated group of devices, as recited in the '871 Patent. Therefore, Kahn in view of Gutierrez renders obvious this limitation of the '871 Patent.

200. Therefore, a POSITA would understand that Kahn in view of Gutierrez renders obvious every element recited in Claim 20. As such, Claim 20 would be obvious to a POSITA over Kahn in view of Gutierrez

d. Claim 21

[21.1] - The method of claim 18, wherein the sensors include: a level sensor of a tank at a given one of the facilities and wherein the datastore includes a record associating the tank with the given facility; and

201. Gutierrez discloses level sensors for chemical reservoirs. Ex. 1006, 12:65-13:8 (“the GUI 315 may display a level of a chemical reservoir at the chemical injection system 310”).

202. Gutierrez discloses sensor readings of fluidic pressure and fluidic storage level. Ex. 1006, 13:27-49 (“One or more of GUIs 400, 410, 420, and 430 may be displayed on the computer 305 in place of or in addition to GUI 315. . . . GUI 400 provides information related to . . . fluidic pressure of fluid flowing through the pipeline and/or from chemical reservoir; fluidic storage level of the chemical reservoir”).

203. Gutierrez discloses separate control systems for “each” system. Ex.

1006, 6:28-35; 10:22-24, 10:34-38, 10:43-59 (“data may be wirelessly transmitted directly to each chemical injection system . . . some or all of the processing of data and command generation may occur at the remote control center 220 rather than each individual chemical injection system 220.”), 11:55-61 (“each computer 305 may monitor, receive data from, and/or generate commands transmitted to a single chemical injection system 310 or multiple chemical injection systems 310.”), 11:62-12:3, 13:10-26 (“a user or operator may utilize the GUI 315 to control one or more components of the chemical injection system 310”); Claim 1.

204. A POSITA would recognize that Gutierrez’s disclosure of a level sensor of fluid in a designated reservoir would sense the level of fluid within a particular tank, as recited in the ’871 Patent.

[21.2] - a leak detector at the given facility, and wherein the datastore includes a record associating the leak detector with the given facility.

205. Gutierrez discloses sensors for chemical reservoirs. Ex. 1006, 12:65-13:8 (“the GUI 315 may display a level of a chemical reservoir at the chemical injection system 310”), 13:27-49 (“One or more of GUIs 400, 410, 420, and 430 may be displayed on the computer 305 in place of or in addition to GUI 315. . . . GUI 400 provides information related to . . . fluidic pressure of fluid flowing through the pipeline and/or from chemical reservoir; fluidic storage level of the chemical reservoir”).

206. Gutierrez discloses that when such sensed pressure falls below a minimum threshold, such as when a pipeline break occurs, the processor 150 may command the motor controller 115 to stop or reduce the speed of the motor 110 and pump 105 so that additional chemicals are not injected into the pipeline 120 and wasted. Ex. 1006, 10:11-16.

207. A POSITA would recognize that Gutierrez's disclosure of pressure sensors used to detect leaks or breaks discloses a leak detector at a given facility with a record associated with the leak detector as Gutierrez discloses follow up actions taken by its described system when a leak is detected, as recited in the '871 Patent.

208. A POSITA would recognize that the disclosure in Gutierrez matches the relevant disclosure in the '871 Patent. The relevant disclosure in the '871 Patent merely recites that in the data store 34 of some embodiments, the site master-controllers 16 may be organized according to user accounts, with each site master-controller 16 corresponding to at least one user account and some user accounts corresponding to multiple site master-controllers 16. Ex. 1001, 4:24-39.

209. Therefore, a POSITA would understand that Gutierrez discloses every element recited in Claim 21. As such, Claim 21 would be obvious to a POSITA over Kahn in view of Gutierrez.

e. Claim 23

[23.1] The method of claim 18, comprising: steps for interfacing with a plurality of site controllers associated with the facilities; and

210. Kahn and Gutierrez disclose steps for interfacing with a plurality of site controllers associated with facilities, as discussed above for Claim 18.4, and incorporated herein. A POSITA would recognize that Kahn and Gutierrez disclose steps for interfacing with a plurality of site controllers associated with the facilities, as recited in the '871 Patent.

[23.2] steps for sending instructions to present a control interface on the user devices.

211. Kahn and Gutierrez disclose steps for interfacing with a plurality of site controllers associated with facilities, as discussed above for Claim 18.6, and incorporated herein. A POSITA would recognize that Kahn and Gutierrez disclose steps for sending instructions to present a control interface on the user devices as a graphical user interface, as recited in the '871 Patent.

212. Therefore, a POSITA would understand that Kahn and Gutierrez disclose every element recited in Claim 23. As such, Claim 23 would be obvious to a POSITA over Kahn in view of Gutierrez.

f. Claim 26

[26.1] The method of claim 18, comprising instantiating at least three of the following as distinct threads from one another:

213. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

214. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java and C++.

215. As such, Claim 26 would be obvious to a POSITA over Kahn in view of Gutierrez.

[26.2] a thread configured to sends and receive data requests;

216. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic,

assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

217. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

218. As such, Claim 26 would be obvious to a POSITA over Kahn in view of Gutierrez.

[26.3] a thread configured to synchronize other threads with updated information;

219. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

220. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

221. As such, Claim 26 would be obvious to a POSITA over Kahn in view

of Gutierrez.

[26.4] a thread configured to set a target state of actuators;

222. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

223. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

224. As such, Claim 26 would be obvious to a POSITA over Kahn in view of Gutierrez.

[26.5] a thread configured to obtain updated sensor readings;

225. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic,

assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

226. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

227. As such, Claim 26 would be obvious to a POSITA over Kahn in view of Gutierrez.

*[26.6] a thread configured to process user interactions;
and*

228. Claim 26 depends from independent Claim 18. Kahn in view of Gutierrez renders Claim 18 obvious for the reasons discussed above and incorporated herein.

229. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

230. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread

implementations recited in Claim 26, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

231. As such, Claim 26 would be obvious to a POSITA over Kahn in view of Gutierrez.

[26.7] a thread that eliminates other threads upon detecting a problem with the eliminated threads.

232. Claim 26 depends from independent Claim 18. Kahn in view of Gutierrez renders Claim 18 obvious for the reasons discussed above and incorporated herein.

233. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 26, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

234. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 26, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

235. As such, Claim 26 would be obvious to a POSITA over Kahn in view of Gutierrez

g. Claim 27

[27.1] - The method of claim 18, comprising instantiating each and every of the following as distinct threads from one another:

236. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

237. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

[27.2] - a thread configured to sends or receive data request;

238. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

239. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++.

[27.3] - a thread configured to synchronize other threads with updated information;

240. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

241. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

[27.4] - a thread configured to set a target state of actuators;

242. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in

any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

243. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

[27.5] - a thread configured to obtain updated sensor readings;

244. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

245. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54. .

*[27.6] - a thread configured to process user interactions;
and*

246. Claim 27 depends from independent Claim 18. Kahn in view of Gutierrez renders Claim 18 obvious for the reasons discussed above and incorporated herein.

247. The disclosure of Kahn inherently anticipates, or renders obvious, the elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

248. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

*[27.7] - a thread that eliminates other threads upon
detecting a problem with the eliminated threads.*

249. Claim 27 depends from independent Claim 18. Kahn in view of Gutierrez renders Claim 18 obvious for the reasons discussed above and incorporated herein.

250. The disclosure of Kahn inherently anticipates, or renders obvious, the

elements of Claim 27, as discussed above and incorporated herein. A POSITA would also recognize that Gutierrez discloses software applications written or described in any appropriate computer language including C, C-++, Java, Visual Basic, assembler, Perl, any suitable version of 4GL, as well as others. Ex. 1006, 8:54-62, 11:50-54.

251. A POSITA would recognize that Kahn and Gutierrez inherently disclose, or render obvious, instantiation of threads, and the various thread implementations recited in Claim 27, through computer coding in computer languages such as Java and C++. Ex. 1006, 8:54-62, 11:50-54.

h. Claim 28

[28] - The method of claim 18, comprising: communicating, with a controller at one of the facilities, with an actuator or a sensor to actuate the actuator or read from the sensor.

252. Kahn and Gutierrez disclose steps for interfacing with a plurality of site controllers associated with facilities, as discussed above for Claims 18.4, 18.5, and 18.6, and incorporated herein.

253. A POSITA would recognize that Kahn and Gutierrez disclose communicating with a controller at one of the facilities to control an actuator or read from a sensor, as recited in the '871 Patent. As such, Claim 28 would be obvious to a POSITA over Kahn in view of Gutierrez.

i. Claim 29

[29] - The method of claim 28, wherein the controller is communicatively coupled to the actuator and the sensor via a private local area network, and wherein controller is communicatively coupled to the actuator or sensor via a frame-based carrier-sense multiple access protocol with collision detection.

254. Gutierrez discloses coupling the controller with the actuator and sensor via a local private area network, namely a “secured network” over one of several communications protocols including VPN, LAN, RAN, MAN, WAN, or the internet. Ex. 1006, 12:26-64.

255. A POSITA would recognize that Kahn in view of Gutierrez renders obvious a frame-based carrier-sense multiple access protocol with collision detection because a POSITA would know that frame-based carrier-sense multiple access protocol with collision detection, as recited in the '871 Patent, is an Ethernet networking technology. Ex. 1006, 12:26-64.

256. A POSITA would recognize that Kahn in view of Gutierrez renders obvious communicating with a controller at one of the facilities to control and actuator or read from a sensor via a private local area network that uses a frame-based carrier-sense multiple access protocol with collision detection. Ex. 1006, 12:26-64. As such, Claim 29 would be obvious to a POSITA over Kahn in view of Gutierrez.

j. Claim 31

[31] - The method of claim 28, comprising: steps for ensuring at least some data is not lost if network access ceases intermittently.

257. Gutierrez discloses that Controller 130 is communicably coupled to the motor controller 115 and provides microprocessor-based control of the motor controller 115 and thus motor 110 and pump 105 . . . a communication module 140, a translation module 145, motor driver, data acquisition, data storage, and a processor 150. Ex. 1006, 8:16-21.

258. A POSITA would recognize that Kahn in view of Gutierrez renders obvious steps for ensuring at least some data is not lost if network access ceases intermittently because controller 130 includes data storage. Ex. 1006, 8:16-21. As such, Claim 31 would be obvious to a POSITA over Kahn in view of Gutierrez.

k. Claim 32

[32.1] - The method of claim 28, comprising: steps for translating a command for an actuator from an input format to a format configured to effectuate changes in the actuator;

259. A POSITA would recognize that Gutierrez discloses steps for translating a command for an actuator from an input format to a format configured to effectuate changes in the actuator. Ex. 1006, 2:18-25, 41-47, 4:7-14, 8:19-21, 23-31, 9:34-64 (“translation module 145 receives data communicated in a particular communication protocol to the system 100 via the communication bus 155 and/or

wireless antenna 160 and, when necessary, translates such data to a secondary communication protocol understood by the motor controller 115 or other components of the system 100.”).

*[32.2] - steps for executing control routines implicated by translated commands on an individual actuator or sensor;
and*

260. Gutierrez discloses a translation module that converts communication protocol messages into the communication protocol for fluid control actuation devices. Ex. 1006, 2:18-25, 41-47, 4:7-14, 8:19-21, 23-31, 9:34-64 (“the translation module 145 may allow a user or operator to connect to the controller 130 and receive feedback data (e.g., operational data of the motor 110, pump 105, or any other component of the system 100) without regard to a particular protocol understood by the user's device”).

261. A POSITA would recognize that Gutierrez discloses steps for translating a command for an actuator from an input format to a format configured to effectuate changes in the actuator.

[32.3] - steps for transmitting data to the facility-interface module or modules.

262. Gutierrez discloses steps for interfacing with site controllers associated with facilities, as discussed above for Claims 18.5, and 18.6, and incorporated herein.

263. A POSITA would recognize that Gutierrez discloses communicating

with a controller at one of the facilities to control and actuator or read from a sensor, as recited in the '871 Patent. Therefore, a POSITA would understand that Gutierrez discloses every element recited in Claim 32. As such, Claim 32 would be obvious to a POSITA over Kahn in view of Gutierrez.

I. Claim 34

[34] The method of claim 28, comprising: steps for mitigating shocks to up-stream or down-stream fluid-handling devices.

264. Gutierrez discloses steps for mitigating shocks to up-stream or down-stream fluid-handling devices. Ex. 1006, 5:11-14, 8:34-38, 10:11-16 (“When such sensed pressure falls below a minimum threshold, such as when a pipeline break occurs, the processor 150 may command the motor controller 115 to stop or reduce the speed of the motor 110 and pump 105 so that additional chemicals are not injected into the pipeline 120 and wasted”). The '871 Patent explains that shocks to up-stream or down-stream fluid-handling devices may be mitigated by a series of commands gradually changing the state of a given fluid-handling device, for instance gradually ramping up or down the speed of a pump or gradually opening or closing a valve. Ex. 1001, 6:29-34.

265. A POSITA would recognize that Gutierrez discloses steps for mitigating shocks to up-stream or down-stream fluid-handling devices, as recited in the '871 Patent. Ex. 1006, 5:11-14, 8:34-38, 10:11-16. As such, Claim 34 would be

obvious to a POSITA over Kahn in view of Gutierrez.

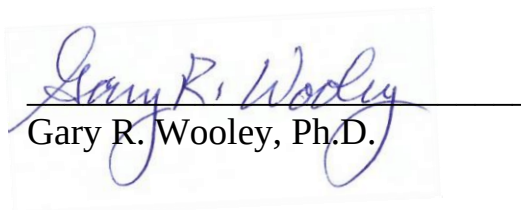
VII. CONCLUSION

266. For the reasons set forth above, in my opinion, all of the limitations of claims 18-23, 25-32, and 34 of the '871 Patent are rendered unpatentable as anticipated or obvious by the above-cited prior art.

VIII. OATH

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the results of these proceedings.

Dated: April 15, 2024



Gary R. Wooley, Ph.D.