

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TANKLOGIX, LLC,
Petitioner v.

SITEPRO, INC.,
Patent Owner

Case No. IPR 2025-00649

Expert Declaration in Support of Petitioner's Petition for *Inter Partes* Review of
U.S. Patent No. 9,342,078

DECLARATION OF GARY R. WOOLEY, Ph.D.

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I. INTRODUCTION

A. Background and Qualifications

1. My name is Gary R. Wooley. I have been retained by the petitioner TankLogix, LLC (“TankLogix”) 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 No. 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 1-8, 11-13, and 15-19 of the '078 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 \$840 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 remotely controlling fluid-handling devices at petroleum facilities and saltwater disposal facilities.

10. More specifically, for this work, I have been asked to review the Challenged Patents including the specifications 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. 9,342,078
Ex 1002	Declaration of Dr. Gary Wooley
Ex 1003	Curriculum Vitae of Dr. Gary Wooley
Ex 1004	File Wrapper for U.S. Patent No. 9,342,078
Ex 1005	U.S. Patent No. 8,667,091 to Almadi

Exhibit	Description
Ex 1006	U.S. Patent No. 9,709,995 to Gutierrez
Ex 1007	SCADA: Supervising Control and Data Acquisition (4 th Edition)
Ex. 1008	Judicial Caseload for Western District of Texas

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. TankLogix'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 *Spansion, 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 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 POSITA at the time of the alleged invention would have had at least a bachelor's degree in engineering (mechanical, chemical, or electrical), 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 in view of the above-recited 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](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 '078 Patent, entitled "Remote Control of Fluid-Handling Device," describes a method, comprising receiving a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol; obtaining a target state of at least one of the fluid-handling devices, for each of the plurality of instructions, selecting a respective protocol or protocols from among a plurality of protocols different from the shared protocol; translating each received instructions into one or more translated instructions encoded in the selected respective protocol or protocols; and sending each translated instructions to at least the fluid handling device to which the respective translated instruction is directed. Ex. 1001, Claim 1.

C. Prosecution History Summary

1. The '078 Patent History (Ex. 1004)

29. The application resulting in the '078 Patent was filed on January 3, 2014. In a first office action, the Examiner rejected claims 1-8, 11-14, 17, and 19-20 are rejected under 35 U.S.C. 102(b) as being unpatentable by U.S. Patent Publication No. 2004/0262008 (Deans et al.). Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0262008 (Deans

et al.) in view of U.S. Patent Publication No. 2004/0231851 (Silvers). Claims 10 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0262008 (Deans et al.) in view of WO 2008/124765 (Roberson et al.). Claims 15-16 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0262008 (Deans et al.) in view of U.S. Patent No. 5,149,443 (Varnam). Ex. 1004, at 273-306.

30. In a February 5, 2015 response to the first office action, the Applicant canceled pending claims 1-20 and put forth new claims 21-59. The new claims are directed systems and methods for receiving, via a network interface, a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol. Ex. 1004, at 206-221.

31. In a March 18, 2015 Final Office Action, the examiner rejected Claims 21-24, 32-34, 39-43, 51-53, and 58-59 under 35 U.S.C. 102(b) as being unpatentable by U.S. Patent No. 7,289,994 (Nixon et al.). Claims 25 and 44 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nixon et al. in view of Roberson et al. Claims 26-28, 30-31, 36, 45-47, 49-50, and 55 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nixon et al. in view of Deans et al. Claims 29 and 48 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nixon et al. in

view of Deans et al. and further in view of U.S. Patent Publication No. 2001/0032518 (Boger et al.). Ex. 1004, at 121-201.

32. On August 18, 2015, the Applicant filed a Request for Continued Examination and Response to Final Office Action. In the RCE, the Applicant amended the claims to include obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions. Ex. 1004, at 80-106.

33. The Applicant further amended the claims to recite that the translation of the received instructions occurs after determining the plurality of different target states. Ex. 1004, at 80-106. Additionally, the Applicant argued that Deans does not teach or suggest the claim feature of "after determining the plurality of different target states, translating each received instructions into one or more translated instructions encoded in the selected respective protocol or protocols," as recited by each independent claim. Ex. 1004, pp. 80-106. The applicant also filed a terminal disclaimer to limit the statutory term of any patent granted from the application to the patent term of the '909 Patent. Ex. 1004, pp. 75-77.

34. In a September 29, 2015, Notice of Allowability, the Examiner allowed claims 21-59. Ex. 1004, at 58-64.

D. Overview of the Prior Art

1. Almadi (Ex. 1005)

35. U.S. Patent No. 8,667,091 to Almadi was filed on July 22, 2011, published on April 5, 2012, and claims priority to Provisional Patent Application No. 61/367,207 filed on July 25, 2010. Almadi issued March 4, 2014. Almadi is prior art under pre-AIA § 102(a).

36. Almadi teaches an integrated node used to interface between a remote host server and a plurality of remote subsystems in a process automation environment to provide, in turn, for a single point of control for data collection, monitoring, and restoration. Ex. 1005, 2:64-31

37. The claimed node integrates the functions of controller units, communications networking devices, and data storage servers into one unit. Embodiments of an integrated node can also, for example, support networking over multiple communication interfaces and transmit process data to a remote host server over TCP/IP (transmission control protocol and the internet protocol, also referred to as the internet protocol suite). Ex. 1005, 3:10-20.

2. Gutierrez (Ex. 1006)

38. 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).

39. 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.*

3. SCADA (Ex. 1007)

40. SCADA: Supervisory Control and Data Acquisition, 4th Edition was published in 2010 and is prior art under pre-AIA §§ 102(a). SCADA teaches enabling a human operator, in a location central to a widely distributed process-such as a pipeline system, oil or gas field, hydroelectric generating complex, or irrigation network to make set point changes on distant process controllers, to open or close valves or switches, to monitor alarms, and to gather measurement information. Ex. 1007, at 397.

VI. SUMMARY OF MY OPINIONS

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

- Almadi Anticipates Claims 1-8, 11-13, 15-17 or would be obvious to a POSITA in view of Almadi.
- Gutierrez Anticipates Claims 1-2, 6, 11, 16, and 18-19 or would be obvious

to a POSITA in view of Gutierrez.

- SCADA Anticipates Claims 1, 11-12 or would be obvious to a POSITA in view of Almadi.

A. Opinions Regarding the ‘078 Patent

1. Ground 1: Almadi Anticipates Claims 1-8, 11-13, 15-17 Or Would Be Obvious To A POSITA In View Of Almadi

42. Independent claim 1 and dependent claims 2-8, 11-13, 15-19 are anticipated by U.S. Patent No. 8,887,901 (“Almadi”) under 35 U.S.C. § 102 or would be obvious to a POSITA in view of Almadi under 35 U.S.C. § 103.

a. Claim 1

[1.1] A method, comprising:

43. A POSITA would recognize that the method disclosed by Almadi remotely monitors and controls a fluid handling device pump at oil wells, water disposal sites, re-injection facilities, or petroleum pumping stations. *See, e.g.*, Ex. 1005, Abstract; 1:18-22, 8:27-67. Therefore, Almadi discloses the method of the ‘078 Patent.

[1.2] receiving, via a network interface, a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol;

44. 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/>.

45. 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.>

46. 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.

47. Protocol translation is a method for transforming pieces of information from a source protocol into relevant target protocol formats in order to communicate between heterogeneous legacy systems in interoperability environments, such as fluid-handling sites.

<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>

48. 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.

49. It is well known that a user could send one instruction a set of instructions or sets of instructions to a fluid-handling device depending on the desired function of the fluid-handling device.

50. A POSITA would understand that Almadi discloses the recited receiving via a network interface, a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol of the '078 Patent through its disclosure of receiving commands, like instructions from a user through remote host 110, which connects through integrated node 100 to

individually addressable remote subsystems 120 for controlling operation of well site components. Ex. 1005, 11:31-35, 12:10-15, 12:55-59, 13:51-14:9. Thus, Almadi discloses this claim element.

[1.3] obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions, wherein obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions comprises:

51. A target state is the particular operating condition that a device is in at a particular time. Determining the target state of the fluid-handling devices is necessary to understand whether a fluid-handling device is operating within the proper device parameters or whether the operating condition of the fluid-handling device should be changed. It is well known in certain device configurations at fluid handling sites that fluid handling devices will continue to operate based on the last received commands in the event a connection to the server is lost.

52. A POSITA would understand that Almadi's disclosure of monitoring and collecting data, such as measurements of fluid pressure, temperature, or flow determines a plurality of different target states of a given one of the fluid-handling devices over time is obtaining a target state of the fluid-handling devices based on a plurality of instructions as claimed in the '078 Patent. Ex. 1005, 1:18-57, 12:27-59; 25:26-37.

[1.4] after receiving the instructions, determining a plurality of different target states of at least one of the fluid-handling devices, the plurality of different states each corresponding to different times;

53. It is well known that fluid-handling devices could be polled automatically or manually to determine the current operational state. *See supra*, ¶¶ 51-52 (above discussion of target states). Additionally, it is well known that the devices can be polled at different times and that the operational target state can be associated with the time that the target state is polled.

54. A POSITA would understand that Almadi's disclosure of monitoring and collecting measurement data can be done automatically or manually at different times and is the determining a plurality of different target states corresponding to different times claimed in the '078 Patent. *See, e.g.*, Ex. 1005, Abstract, FIG. 6, FIGS. 8-11; 4:30-34, 5:4-6:53, 7:26-34, 7:59-64, 8:6-45, 9:1-33, 15:38-16:50, 17:1-14, 17:29-35, 7:50-65, 19:8-14, 19:26-38, 21:23-27, 23:10-15. Thus, Almadi discloses after receiving the instructions, determining a plurality of different target states of the at least one of the fluid-handling devices, the plurality of different states each corresponding to different times.

[1.5] for each of the plurality of instructions, selecting a respective protocol or protocols from among a plurality of protocols different from the shared protocol, wherein the respective fluid-handling device or devices to which the respective instruction is directed are responsive to the selected respective protocol or protocols, wherein at least some of the selected protocols are different from one another;

55. A POSITA would further understand from Almadi's disclosure of a protocol translator to translate communications with each of the remote sub-systems and its disclosure of various protocols is the selecting of a protocol from a plurality of instructions from a plurality of different protocols claimed in the '078 Patent. See *supra*, ¶¶ 47-48 (above discussion of translating protocols/protocol translators); Ex. 1005, 14:10-17, FIG. 1B; see also *id.*, 11:35-41, Claim 4. Thus, Almadi discloses this claim element.

[1.6] after determining the plurality of different target states, translating each received instructions into one or more translated instructions encoded in the selected respective protocol or protocols, the one or more translated instructions including the determined plurality of different target states; and

56. A POSITA would understand the use of different protocols by the protocol translator requires that the protocols must be translated and that the translated instructions include the determined plurality of different target states as claimed in the '078 Patent. See *supra*, ¶¶ 47-48 (above discussion of translating protocols/protocol translators); Ex. 1005, 14:10-28, FIGS. 1B, 2D; see also, Ex.

1005, 11:35-41. Thus, Almadi discloses after determining the plurality of different target states, translating each received instructions into one or more translated instructions encoded in the selected respective protocol or protocols, the one or more translated instructions including the determined plurality of different target states.

[1.7] sending each translated instructions to at least the fluid-handling device to which the respective translated instruction is directed, wherein at least some of the translated instructions are effective to cause the at least one of the fluid-handling devices to attempt to achieve the target state

57. A POSITA would understand that Almadi's disclosures of a protocol translator and a network interface for routing connection between a host and remote subsystems is the sending of the translated commands as claimed in the '078 Patent. *See supra*, ¶¶ 30-35 (above discussion of translating protocols and network interfaces); Ex. 1005, 11:35-41, 14:10-17, FIG. 1B; *see also id.*, 1:45-49; 9:54-62, 25:26-37. Almadi discloses this claim element. Thus, Almadi anticipates claim 1 or is obvious to a POSITA in view of Almadi.

b. Claim 2

[2.1] The method of claim 1, wherein selecting a respective protocol or protocols comprises: parsing, from at least one of the received instructions, an identifier of one of the fluid-handling devices; and

58. There are several discussion well-known methods of identifying fluid-handling devices. Controllers are used in remote oil fields and fluid-handling

management systems to control fluid-handling devices such as pumps, valves, filters, tanks, motor drive systems, and pump systems including actuators. Fluid-handling devices can be assigned network addresses. Additionally, identification of fluid-handling devices can be added to a data stream (often as a header) and then sent to the fluid-handling device. A POSITA would understand modeling objects to identify processing units is the passing an identifier of one of the fluid-handling devices. Ex. 1005 24:43-48. Thus, Almadi discloses this claim element.

[2.2] based on the parsed identifier, retrieving from memory one or more records, including an identifier of at least one selected respective protocol and an identifier of a bus to which the identified fluid-handling device is communicatively coupled.

59. Bus topology is a type of network topology in which all devices are connected to a single cable called a "bus." This cable serves as a shared communication medium, allowing all devices on the network to receive the same signal simultaneously. In bus topology, data transmission is achieved through a process known as "collision detection." When a device sends a signal, it is broadcast to all other devices on the network. If two devices try to send data at the same time, a collision occurs, and the signals are corrupted. The devices must then wait a random amount of time before trying to re-transmit the data.

<https://www.lenovo.com/us/en/glossary/bus-topology/?orgRef=https%253A%252F%252Fwww.google.com%252F>

60. 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.>

61. Process modeling captures process behavior using activities, flow dependencies, project resources, and devices. A POSITA would recognize from Almadi's disclosure that modeling objects to identify process stream and process limits is the identifying a respective protocol and bus identifier to which a fluid-handling device is coupled of the '078 Patent. Ex. 1005, 24:43-48

62. Further, a POSITA would understand that Almadi discloses a based on the parsed identifier, retrieving from memory one or more records, including an identifier of at least one selected respective protocol and an identifier of a bus to which the identified fluid-handling device is communicatively coupled of the '078 Patent through it disclosure of a storage medium, modeling of objects and selection of protocols. 120. Ex. 1005, 24:43-48. Almadi discloses this claim element. Thus, Almadi anticipates claim 2 or is obvious to a POSITA in view of Almadi.

c. **Claim 3**

[3] The method of claim 2, wherein sending each translated instructions to at least the fluid-handling device to which the respective instruction is directed comprises: sending an address of the identified fluid-handling device on the identified bus in association with at least some of the translated instructions.

63. A POSITA would understand that Almadi's disclosure of a network interface and modeling objects that include routing and process streams is the sending an address of a fluid-handling device or a bus with at least some of the translated instructions. *See supra*, ¶ 30-35 (above discussion of network interface and modeling objects); Ex. 1005, 14:10-17, FIG. 1B; *see also id.*, 11:35-41. Thus, Almadi discloses sending an address of the identified fluid-handling device or the identified bus in association with at least some of the translated instructions.

d. **Claim 4**

[4.1] The method of claim 2, wherein sending each translated instructions to at least the fluid-handling device to which the respective instruction is directed comprises: providing at least some of the translated instructions to a link-layer device connected to the identified bus; and

64. 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>

65. 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>

66. 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>

67. 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.

68. 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. A POSITA would understand that the Ethernet switch of Almadi is a link layer device that is capable of regenerating the signal it receives. Ex. 1005, 12:64-13:3; 14:9-22. Thus, Almadi discloses this claim element.

[4.2] encoding the translated instructions with the link-layer device in accordance with the physical medium by which the identified bus is implemented.

69. I would understand from Almadi's disclosures of the Ethernet switch that it can encode translated instructions and that because it is a link layer device, it operates in both the physical and data link layers. See *supra*, ¶ 33 (above discussion of translating protocols/protocol translators); Ex. 1005, 12:64-66, 14:19-22. Thus, Almadi discloses claim 4 of the '078 Patent.

e. Claim 5

[5.1] The method of claim 2, wherein sending each translated instruction to at least the fluid-handling device to which the respective instruction is directed comprises: providing at least some of the translated instructions to a

digital-to-analog converter connected to the identified bus; and

70. It is well known that fluid-handling devices can be analog or digital devices. As such, a digital-to-analog connector is needed to convert digital and analog signals to facilitate connections and communications between fluid-handling devices connected via a Bus. A digital-to-analog converter (DAC) is a data converter that generates an analog output from a digital input.
<https://www.sciencedirect.com/topics/engineering/digital-to-analog-converter>
<https://www.sciencedirect.com/topics/engineering/digital-to-analog-converter>.

71. A DAC converts a limited number of discrete digital codes to a corresponding number of discrete analog output values. A POSITA would understand that Almadi's disclosure of analog and digital inputs and outputs of a network interface and protocol translator is the providing translated instructions to a digital-to-analog convertor as claimed in the '078 Patent. Ex. 1005, 14:22-32. Thus, Almadi discloses providing at least some of the translated instructions to a digital-to-analog converter connected to the identified bus.

[5.2] sending the at least some of the translated instructions to the identified fluid-handling device with the digital-to-analog converter.

72. A POSITA would understand from Almadi's disclosure that digital and analog outputs and communication protocols is the sending translated instructions

with a digital-to-analog converter as claimed in the '078 Patent. *See supra*, ¶¶ 70-71 (above discussion of digital to analog conversion); Ex. 1005, 14:28-32. Almadi discloses sending the at least some of the translated instructions to the identified fluid-handling device with the digital-to-analog converter. Thus, Almadi anticipates claim 5 or is obvious to a POSITA in view of Almadi.

f. **Claim 6**

[6] The method of claim 1, wherein: the at least some of the translated instructions are effective to cause the at least one of the fluid-handling devices to attempt to achieve the plurality of different target state at the different times.

73. A POSITA would understand from the above disclosure that the DRM with the protocol translator and controller can cause a fluid-handling device to achieve a plurality of different target states as claimed in the '078 Patent. *See supra*, ¶¶ 47-48 (above discussion of translating protocols/protocol translators); Ex. 1005, 14:10-17, FIG. 1B; *see also*, Ex. 1005, 11:35-41, Claim 4. Thus, Almadi discloses sending the method of Claim 1, wherein: at least some of the translated instructions are effective to cause at least one of the fluid-handling devices to attempt to achieve the plurality of different target states at different times.

g. **Claim 7**

[7] The method of claim 6, comprising: losing a network connection by which at least some of the plurality of user-directed instructions are received; and after losing the network connection, continuing to cause the at least one

of the fluid-handling devices to attempt to achieve the plurality of different target state at the different times and continuing to execute instructions among the plurality of received instructions received prior to losing the network connection before entering an automatic mode.

74. A POSITA would understand from the above that Almadi's disclosure of detecting a communication failure is the continuing to execute instructions received prior to the loss of network connection as claimed in the '078 Patent. *See supra*, ¶¶ 53, 57, 60 (above discussion of the maintenance of a target state after losing a network connection); Ex. 1005, 1:18-57; *id.*, 12:27-59. Thus, Almadi anticipates Claim 7 or is obvious to a POSITA in view of Almadi.

h. Claim 8

[8] The method of claim 6, wherein the plurality of different states ramp up or ramp down a motor speed of a motor of the at least one of the fluid-handling devices.

75. It is well known that networked motors at well sites are intelligent equipment devices. Additionally, it is well known that commands can be sent to fluid-handling devices to ramp the speed of the motor up or down. A POSITA could understand that Almadi's disclosure of the use of control data by intelligent equipment devices is the ramping up or down the speed of a motor where the signal to ramp up or ramp down is control data and where the motor is an intelligent equipment device. *See, e.g.*, Ex. 1005, 1:45-49; *see also id.*, 25:26-37 ("switching a pump off if the flow is below certain limit or activating some bounds or streams

based on some readings/conditions”); see also 12:27-59. Thus, Almadi anticipates claim 8 or is obvious to a POSITA in view of Almadi.

i. **Claim 11**

[11] The method of claim 1, wherein at least some of the received instructions identify an automatic mode in which a collection of target states are computed to operate within process constraints.

76. In automatic mode, a device shall be controlled entirely by the control system. Starting and stopping pumps or closing and opening valves shall be performed automatically and in accordance with the relevant sequence- and control algorithms. The operator shall not have the capability to issue a command individually to a device while it is in automatic mode. However, the current status of the device shall be monitored and indicated on the display devices of the SCADA system. See, e.g., <https://hansaconsult.com/control/modes-of-operation/#:~:text=In%20the%20manual%20mode%2C%20a,limits%20the%20extent%20of%20operations>.

77. It is well known that instructions can be sent that identify the operation of fluid-handling devices in an automatic mode. Only operating in an automatic mode, the fluid-handling device uses target states to maintain the operation of the fluid-handling device within process constraints. A POSITA would understand from Almadi’s disclosure that the time synchronization of data (i.e., received instructions) can be done continuously is the automatic mode in which a collection of target states

is computed as claimed in the '078 Patent. *See, e.g.*, Ex. 1005, 1:45-49; *see also id.*, 25:26-37 (“switching a pump off if the flow is below certain limit or activating some bounds or streams based on some readings/conditions”); *id.* 12:27-59. Thus, Claim 11 is anticipated by Almadi or would be obvious to a POSITA in view of Almadi.

j. **Claim 12**

[12] The method of claim 1, wherein at least some of the received instructions correspond to a manual mode in which an individual one of the fluid-handling devices is remotely controlled by a user

78. In manual mode, a device shall be operated by issuing commands from the operating console of the SCADA system utilizing dialogue boxes, buttons, and other appropriate tools. The level of authorization identified by the log-in code limits the extent of operations. Only operators logged in with a sufficient level of authorization shall be allowed to perform particular operations. Safety interlocks associated with such operations shall be activated and executed within the second (PLC) layer of the control system. *See, e.g.*, <https://hansaconsult.com/control/modes-of-operation/#:~:text=In%20the%20manual%20mode%2C%20a,limits%20the%20extent%20of%20operations.>

79. It is well known that a user can operate a fluid-handling device in a manual mode. A POSITA would understand from Almadi's disclosures that the on-demand time synchronization of data is the manual mode in which an individual

fluid-handling device is controlled by a user. Ex. 1005, 12:10-19. Thus, Claim 12 is anticipated by Almadi or would be obvious to a POSITA in view of Almadi.

k. **Claim 13**

[13] The method of claim 1, comprising: before sending at least one of the translated instructions, accessing a constraint value stored in memory;

80. A constraint value represents a constant value that is compared to a field value. See *supra*, ¶¶ 47-48, 50-57 (above discussion of translating instructions/protocol translator and set points/target states). Constraint values are accessed before sending additional instructions to determine the current operating state of a fluid-handling device. A POSITA would understand Almadi's disclosure of the determining of the pre-defined exception criteria is the accessing of a constraint value before sending the translated instructions as claimed in the '078 Patent. Ex. 1005, 5:17-39; 17:1-18, 17:29-37, 23:5-40, FIG. 8-9. Thus, Almadi discloses before sending at least one of the translated instructions, accessing a constraint value stored in memory.

[13.2] determining that the at least one of the translated instructions will not violate the constraint value; and

81. A POSITA would understand that Almadi's disclosure of determining whether the time-stamped process data constitutes an exception responsive to the preselected exception criteria determining whether translated instructions will violate a constraint value claimed in the '078 Patent. Ex. 1005:17-39; 17:1-18,

17:29-37, 23:5-40, FIG. 8-9. Thus, Almadi discloses determining that the at least one of the translated instructions will not violate the constraint value.

[13.3] in response to the determination, sending the at least one of the translated instructions.

82. A POSITA would understand that Almadi's disclosure of providing instructions is the sending of the translated commands claimed in the '078 Patent. Ex. 1005:17-39; 17:1-18, 17:29-37, 23:5-40, FIG. 8-9. Almadi discloses in response to the determination, sending the at least one of the translated instructions. Thus, Almadi anticipates claim 13 or is obvious to a POSITA in view of Almadi.

1. **Claim 15**

[15] The method of claim 1, wherein a given one of the fluid-handling devices comprises a proportional-integral-derivative controller, and wherein at least some of the translated instructions adjust a set point of the proportional-integral-derivative controller.

83. A proportional–integral–derivative controller (PID controller or three-term controller) is a control loop mechanism employing feedback that is widely used in industrial control systems and a variety of other applications requiring continuously modulated control. A PID controller continuously calculates an error value $e(t)$ as the difference between a desired setpoint (SP) and a measured process variable (PV) and applies a correction based on proportional, integral, and derivative terms (denoted P, I, and D respectively). See <https://www.power-and-beyond.com/pid-controller-definition-and-explanations-a->

a69cf75cceed7b82932c0793458f58c9/#:~:text=A%20proportional%E2%80%93integral%E2%80%93derivative%20controller,applications%20requiring%20continuously%20modulated%20control.

84. It is well known in certain device configurations at fluid handling sites that fluid handling devices will continue to operate based on the last received commands in the event a connection to the server is lost.

85. A POSITA would understand that the processing of measurement and control data and signal conversions is performed by a proportional-integrated-derivative controller and that the processing of measurement data is the adjusting a set point of the controller. Ex. 1005, 12:15-17. Thus, Almadi anticipates claim 15 or is obvious to a POSITA in view of Almadi.

m. **Claim 16**

[16.1] The method of claim 1, comprising: receiving, at a remote server system, via a network, user credentials from a user device;

86. Almadi discloses a system intended to serve in various networking operating environments, including, for example, intelligent fields for oil and gas, substations/power grid, and remote security, and can be utilized and can be extended for enterprise applications. Ex. 1005, 12:48-59, 13:20-25. Almadi further discloses “[t]hose having skill in the art will appreciate various techniques to ensure no file

access violations during the process of accessing the file, for example, by the remote host 300.” Ex. 1005, 16:65-67. Thus, Almadi discloses this claim element.

[16.2] identifying, with the remote server system, an account based on the user credentials, the account including identifiers of the oil well, the petro water disposal or re-injection facility, or the petroleum pumping station and at least one other facility;

87. Almadi discloses that its disclosed method serves intelligent fields for oil and gas, substations/power grid, and remote security. Ex. 1005, 12:48-59, 13:20-25. Almadi discloses an identifier of a bus to which the identified fluid-handling device is communicatively coupled through its disclosure of “the configuration interface” that allows a user “to identify routing and process streams between plants and different numbers and types of process units, such as tanks, crude switches, and other process units . . .” Ex. 1005 24:43-48.

88. A POSITA would further recognize from the above disclosure that Almadi discloses identifying an account associated with an oil well, the petro water disposal or re-injection facility, or the petroleum pumping station and at least one other facility through its disclosure of a secured network and chemical injection system. Therefore, Almadi discloses this limitation of the ‘078 Patent.

[16.3] receiving from the user device, at the remote server system, a request corresponding to at least one of the received instructions, the request including an identifier of the oil well, the petro water disposal or reinjection facility, or the petroleum pumping station;

89. Almadi discloses that its disclosed method serves intelligent fields for oil and gas, substations/power grid, and remote security. Ex. 1005, 13:20-25. Almadi discloses that integrated node 100 supports a local programming interface over a computer, accessible to a human user through remote host computer 110. Ex. 1005, 12:10-15, 12:55-59. More specifically, Almadi discloses integrated node 100 connected to remote host computer 110 or remote subsystems 120 by way of communication links 115 and 125. Ex. 1005, 11:31-35. Input/output unit 104 provides both serial and Ethernet interfaces over communication links 115 and 125. Ex. 1005, 13:51-14:9 (disclosing various communication protocols). Almadi discloses an identifier of a bus to which the identified fluid-handling device is communicatively coupled through its disclosure of “the configuration interface” that allows a user “to identify routing and process streams between plants and different numbers and types of process units, such as tanks, crude switches, and other process units . . .” Ex. 1005, 24:43-48.

90. A POSITA would readily recognize that Almadi discloses receiving a request corresponding to at least one received instruction as recited in the ‘078 Patent. Therefore, Almadi discloses this limitation of the ‘078 Patent.

[16.4] identifying, with the remote server system, an Internet Protocol address at which the network interface is reachable based on the identifier of the oil well, the petro water disposal or re-injection facility, or the petroleum pumping station; and

91. Almadi discloses an identifier of a bus to which the identified fluid-handling device is communicatively coupled through its disclosure of “the configuration interface” that allows a user “to identify routing and process streams between plants and different numbers and types of process units, such as tanks, crude switches, and other process units . . .” Ex. 1005, 24:43-48.

92. A POSITA would readily recognize that Almadi discloses identifying an Internet Protocol address at which the network interface is reachable as recited in the ‘078 Patent. Therefore, Almadi discloses this limitation of the ‘078 Patent.

[16.5] sending, from the remote server system, the at least one of the received instructions to the identified Internet Protocol address in response to the request.

93. Almadi discloses sending, with the server, the instructions via the internet protocol network address through its disclosure that the integrated node employs an Ethernet switch to support networking over multiple communication interfaces and transmit process data to a remote host server over TCP/IP (transmission control protocol and the internet protocol. Ex. 1005, 3:13-17; *see also*, FIGS. 8-11.

94. More specifically, Almadi discloses that integrated node 100 supports a local programming interface over a computer, accessible to a human user through remote host computer 110. Ex. 1005, 12:10-15. Ex. 1005, 12:55-59. More specifically, Almadi discloses integrated node 100 connected to remote host

computer 110 or remote subsystems 120 by way of communication links 115 and 125. Ex. 1005, 11:31-35. Input/output unit 104 provides both serial and Ethernet interfaces over communication links 115 and 125. Ex. 1005, 13:51-14:9 (disclosing various communication protocols).

95. A POSITA would recognize from the above disclosure that Almadi discloses sending the received instructions to the Internet protocol address of the facility. Therefore, Almadi discloses this limitation of the '078 Patent.

96. As such, Claim 16 is anticipated by Almadi or would be obvious to a POSITA in view of Almadi.

n. **Claim 17**

[17] The method of claim 16, wherein the user device is a smartphone executing a smartphone application that communicates with the remote server system via an application program interface.

97. A POSITA would readily understand that a cell phone adapted to connect to controller 130 would be a smartphone capable of executing a smartphone application. Ex. 1006, 9:65-64. Thus, Almadi discloses Claim 17.

2. Ground 2: Gutierrez Anticipates Claims 1-2, 6, 11, 16, and 18-19 Or Would Be Obvious to A POSITA In View of Gutierrez.

98. Independent Claim 1 and dependent Claims 2, 6, 11, 16, and 18-19 anticipated by the disclosure, either express or inherent, in U.S. Patent No. 9,709,995 ("Gutierrez") under 35 U.S.C. § 102, or would be obvious to a POSITA in view of

Abdallah under 35 U.S.C. § 103.

a. **Claim 1**

[1.1] A method, comprising:

99. To the extent that the Board finds that the preamble is limiting, Gutierrez discloses a method. *See, e.g.*, Ex. 1006, 1:54-2:8, 5:32-36, Claims 1-8. A POSITA would readily recognize that Gutierrez discloses a method.

[1.2] receiving, via a network interface, a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol;

100. A POSITA would recognize from the above disclosures that Gutierrez discloses receiving a plurality of user-directed instructions to control fluid-handling devices as recited in the '078 Patent. Ex. 1006, 1:54-2:8, 5:32-36, Claims 1-8. Thus, Gutierrez discloses receiving, via a network interface, a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol.

[1.3] obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions, wherein obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions comprises:

101. A POSITA would recognize from the above disclosures that Gutierrez discloses obtaining a target state of at least some of the plurality of instructions the addresses for facilities as recited in the '078 Patent. *See, e.g.*, Ex. 1006, 3:40-45, 5:58-67, 6:1-10, 6:13-23, 6:24-44, 9:21-25, 9:55-64, 10:27-30, 10:39-43, 11:18-26, 13:9-26. Thus, Gutierrez discloses this claim element.

[1.4] after receiving the instructions, determining a plurality of different target states of the at least one of the fluid-handling devices, the plurality of different states each corresponding to different times;

102. A POSITA would recognize from the above disclosures that Gutierrez discloses determining a plurality of target states of at least one fluid-handling device where the different target states correspond to different times as recited in the '078 Patent. *See, e.g.*, Ex. 1006, 3:40-45, 5:58-67, 6:1-10, 6:13-23, 6:24-44, 9:21-25, 9:55-64, 10:27-30, 10:39-43, 11:18-26, 13:9-26. Therefore, Gutierrez discloses this limitation of the '078 Patent.

[1.5] for each of the plurality of instructions, selecting a respective protocol or protocols from among a plurality of protocols different from the shared protocol, wherein the respective fluid-handling device or devices to which the respective instruction is directed are responsive to the selected respective protocol or protocols, wherein at least some of the selected protocols are different from one another;

103. A POSITA would recognize from the above disclosures that Gutierrez discloses selecting a protocol or protocols from the plurality of protocols as

recited in the '078 Patent. Ex. 1006, 9:41-46. Therefore, Gutierrez discloses this limitation of the '078 Patent.

[1.6] after determining the plurality of different target states, translating each received instructions into one or more translated instructions encoded in the selected respective protocol or protocols, the one or more translated instructions including the determined plurality of different target states; and

104. A POSITA would recognize from the above disclosures that Gutierrez discloses translating the receiver instructions into translated instructions encoded in a respective protocol or protocols as recited in the '078 Patent. Ex. 1006, 2:18-25, 41-47, 4:7-14, 8:19-21, 23-31, 9:34-64. Thus, Gutierrez discloses this claim element.

[1.7] sending each translated instructions to at least the fluid-handling device to which the respective translated instruction is directed, wherein at least some of the translated instructions are effective to cause the at least one of the fluid-handling devices to attempt to achieve the target state

105. A POSITA would recognize that Gutierrez discloses the control interfaces on a user computer device is the sending commands to control fluid handling system actuators in an attempt to achieve the target state, as recited in the '078 Patent. Ex. 1006, 2:18-25, 41-47, 4:7-14, 8:19-21, 23-31, 9:34-64. Therefore, Gutierrez discloses this limitation of the '078 Patent.

b. Claim 2

[2.1] The method of claim 1, wherein selecting a respective protocol or protocols comprises: parsing, from at least one of the received instructions, an identifier of one of the fluid-handling devices; and

106. Gutierrez discloses parsing, from at least one of the received instructions, an identifier of one of the fluid-handling devices through its disclosure that the production sites are uniquely addressable by the network connection through individualized control systems for “each” fluid-handling device.

107. A POSITA would recognize that Gutierrez discloses parsing an identifier of fluid-handling devices from the received instructions as recited in the ‘078 Patent. 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.”). Therefore, Gutierrez discloses this limitation of the ‘078 Patent.

[2.2] based on the parsed identifier, retrieving from memory one or more records, including an identifier of at least one selected respective protocol and an identifier of a bus to which the identified fluid-handling device is communicatively coupled.

108. Gutierrez discloses retrieving from memory one or more records, including an identifier of at least one selected respective protocol through its disclosure of a memory (Ex. 1006, 11:42-53) and a protocol identification through its disclosure that data may be sent to the controller 130 in many different protocols,

such as RS-232, RS-485 (Modbus or EIA-485), RS-422 (or EIA-422), TCP/IP, Fieldbus, DeviceNet, and Profibus. Ex. 1006, 9:41-44; Claim 1.

109. Gutierrez discloses an identifier of a bus to which the identified fluid-handling device is communicatively coupled through its disclosure that in some embodiments, the controller is communicably coupled (e.g., wirelessly, via wired communication, or a combination thereof) to one or more communication stations 320. For example, in some embodiments, data may be transmitted between the communication station 320 and the chemical injection system 310 via a particular communication protocol (e.g., RS-232, RS-485 (Modbus or EIA-485), RS-422 (or EIA-422), TCP/ IP, Fieldbus, DeviceNet, and Profibus, to name but a few) and over a certain communication form (e.g., cellular, RF, satellite, or other type of communication form). Ex. 1006, 12:29-39; Claim 1.

110. A POSITA would recognize that Gutierrez discloses the retrieving from memory records that include protocol and bus identifiers as recited in the '078 Patent. Ex. 1006, 12:29-39; Claim 1. Therefore, Gutierrez discloses this limitation of the '078 Patent.

111. As such, Claim 2 is anticipated by Gutierrez or would be obvious to a POSITA in view of Gutierrez.

c. Claim 6

[6.1] The method of claim 1, wherein: the at least some of

the translated instructions are effective to cause the at least one of the fluid-handling devices to attempt to achieve the plurality of different target state at the different times.

112. Gutierrez discloses a translation module that converts communication protocol messages into the communication protocol and sends the translated messages to the respective fluid control actuation devices. 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.”).

113. Gutierrez discloses a server receiving values for operational parameters of the transmission system based on a command received from a user, as well as transmitting commands based on one or more operational parameters to adjust control parameters in the system, such as the speed of a motor, in an attempt to achieve the target state. *See, e.g.*, Ex. 1006, 3:40-45, 5:58-67, 6:1-10, 6:13-23, 6:24-44, 9:21-25, 9:55-64, 10:27-30, 10:39-43, 11:18-26, 13:9-26.

114. A POSITA would recognize that Gutierrez discloses causing the fluid-handling devices to attempt to achieve a plurality of target states as recited in the ‘078 Patent. *See, e.g.*, Ex. 1006, 3:40-45, 5:58-67, 6:1-10, 6:13-23, 6:24-44, 9:21-25, 9:55-64, 10:27-30, 10:39-43, 11:18-26, 13:9-26. As such, Claim 6 is anticipated

by Gutierrez or would be obvious to a POSITA in view of Gutierrez.

d. **Claim 16**

[16] The method of claim 1, comprising: receiving, at a remote server system, via a network, user credentials from a user device;

115. A POSITA would recognize that Gutierrez discloses a plurality of accounts, namely one or more geographically distributed fluid-handling facilities. A POSITA would further recognize from the disclosure of Gutierrez that the disclosed geographically distributed accounts associate fluid-handling facilities from different entities because Gutierrez discloses systems with multiple fluid-handling facilities, as well as geographically distributed systems with multiple types of fluid-handling facilities, including production sites and pipeline monitoring locations.

116. Therefore, Gutierrez discloses the plurality of accounts recited in the ‘078 Patent.

[16.2] identifying, with the remote server system, an account based on the user credentials, the account including identifiers of the oil well, the petro water disposal or re-injection facility, or the petroleum pumping station and at least one other facility;

117. Gutierrez discloses a remote computing system with a graphical user interface (GUI); a sensor coupled with a hydrocarbon transmission system; and a chemical injection system. Ex. 1006, 2:26-29, 11:38-42 (“reference to the computer 305 includes any processor-based computing device that is operable to manipulate,

display, receive, and/or transmit data, such as data associated with a well site, hydrocarbon piping system, or other hydrocarbon production facility.”). Gutierrez discloses that computer 305 is a server. Ex. 1006, 11:34-37.

118. Gutierrez discloses a remote computing system with a graphical user interface (GUI); a sensor coupled with a hydrocarbon transmission system; and a chemical injection system. Ex. 1006, 2:26-29. 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. Gutierrez discloses chemical injection system 100 that 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. Controller 130 provides microprocessor-based control of the motor controller 115 and thus motor 110 and pump 105. Ex. 1006, 8:15-19. Controller 130 includes a communication module 140 . . . data acquisition, data storage, and a processor 150. Ex. 1006, 8:19-21; *see also id.*, 8:39-9:3.

119. A POSITA would further recognize from the above disclosure that Gutierrez discloses identifying an account associated with an oil well, the petro water disposal or re-injection facility, or the petroleum pumping station and at least one other facility through its disclosure of a secured network and chemical injection system. Therefore, Gutierrez discloses this limitation of the ‘078 Patent.

[16.3] receiving from the user device, at the remote server system, a request corresponding to at least one of the received instructions, the request including an identifier of the oil well, the petro water disposal or reinjection facility, or the petroleum pumping station;

120. 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”); *id.*, 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.”).

121. 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”); *id.*, 13:9-26.

122. Gutierrez discloses that the production sites are unique, disclosing separate 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.”); *id.*, 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.

123. 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 '078 Patent.

[16.4] identifying, with the remote server system, an Internet Protocol address at which the network interface is reachable based on the identifier of the oil well, the petro water disposal or re-injection facility, or the petroleum pumping station; and

124. 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.”).

125. 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. Gutierrez also discloses communications between components of the disclose system through the internet. Ex. 1006, 12:55-64.

126. Gutierrez discloses that the production sites are unique, disclosing separate 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; Claim 1.

127. 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 ’078 Patent.

[16.5] sending, from the remote server system, the at least one of the received instructions to the identified Internet Protocol address in response to the request.

128. 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.”).

129. A POSITA would recognize from the above disclosure that Gutierrez discloses sending the received instructions to the Internet protocol. Thus, Gutierrez discloses this claim element. As such, Claim 16 is anticipated by Gutierrez or would be obvious to a POSITA in view of Gutierrez

e. **Claim 17**

[17] The method of claim 16, wherein the user device is a smartphone executing a smartphone application that communicates with the remote server system via an application program interface:

130. Gutierrez discloses that the user or operator connects to the controller

130 to 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 (i.e., computer, laptop, PDA, cell phone). Ex. 1006, 9:65-64. A POSITA would understand that a cell phone adapted to connect to controller 130 would be a smartphone capable of executing a smartphone application.

131. As such, Claim 17 is anticipated by Gutierrez or would be obvious to a POSITA in view of Gutierrez.

f. **Claim 18**

[18.1] The method of claim 16, wherein receiving from the user device the request corresponding to the at least one of the received instructions comprises: receiving the request from a web interface in a web browser executing on the user device.

132. Gutierrez discloses that the communications network 330 may be all or a portion of an enterprise or secured network; a VPN merely between computer 305 and other computing devices communicably coupled to the base transceiver 325; one or more local area networks (LANs), radio access networks (RANs), metropolitan area networks (MANs), wide area networks (WANs), all or a portion of the global computer network known as the Internet. Ex. 1006, 12:55-64. Gutierrez also discloses a remote computing system with a graphical user interface (GUI) to connect to the system. *See, e.g.*, Ex. 1006, 2:26-29.

133. A POSITA would understand that connecting to the network through the internet would require a web interface in a web browser executing on the user device. A POSITA would understand that a web browser executing on the user device is a graphical user interface (GUI). As such, Claim 18 is anticipated by Gutierrez or would be obvious to a POSITA in view of Gutierrez.

g. **Claim 19**

[19] The method of claim 1, comprising: producing oil or gas; disposing of petro water; or re-injecting petro water.

134. Gutierrez discloses producing oil or gas; disposing of petro water; or re-injecting petro water through its disclosure that sensor readings of fluidic pressure, fluidic storage level, and percentage of water content in the fluidic system. Ex. 1006, 1:18-32 (“Conduit systems that carry and/or transport one or more fluids may utilize injection systems to insert other fluids (e.g., additives, inhibitors, or otherwise) into the conduit system. For example, hydrocarbon systems that transport hydrocarbon fluids, such as oil and/or gas or other fluids, often receive injected fluids to, for example, control corrosion within the conduit or pipeline; prevent paraffin deposition; and break emulsions in the transported hydrocarbon fluids. The injected fluids may also be used for water removal or separation from hydrocarbon gasses or liquids. In some instances, a chemical injector may be associated with a well site or other hydrocarbon production facility to inject chemical additives into a pipeline fluidly coupled at the wellsite with a wellbore producing hydrocarbons.”), 13:27-49

(“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.”).

135. A POSITA would recognize from the above disclosure of a chemical injection system that Gutierrez discloses producing oil or gas; disposing of petro water or reinjecting petro water. As such, Claim 19 is anticipated by Gutierrez, or would be obvious to a POSITA in view of Gutierrez.

3. Ground 3: SCADA Anticipates Claims 1 and 11-12 Or Would Be Obvious To A POSITA In View Of SCADA.

a. Claim 1

136. Independent claim 1 and dependent claims 11-12 are anticipated by SCADA: Supervisory Control and Data Acquisition, 4th Edition (“SCADA”) under 35 U.S.C. § 102, or would be obvious to a POSITA in view of SCADA under 35 U.S.C. § 103.

b. Claim 1

[1.1] A method, comprising:

137. To the extent that the Board finds that the preamble is limiting, SCADA discloses a method for remotely controlling a fluid-handling device of an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station.

138. For example, SCADA discloses that “the technology called SCADA has developed over the last forty years (since about the mid-1960s). It is a collection

of separate technologies, including process instrumentation, various communication methods, and computer applications.” Ex. 1007, Preface.

139. A POSITA would recognize that SCADA discloses a method. Therefore, SCADA discloses the method of the ‘078 Patent.

- i. [1.2] receiving, via a network interface, a plurality of user-directed instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, the plurality of instructions being received encoded in a shared protocol;

140. SCADA discloses receiving, via a network interface, a plurality of user-directed instructions to control fluid-handling devices through its disclosure of the major elements of a SCADA system: “At the center is the operator, who interfaces with the system through some form of input/output (I/O) device[, which] in turn communicates with the master terminal unit (MTU) [that communicates with] one or more remote terminal units (RTUs), each of which communicates with sensors or actuators at the process” site. Ex. 1007, at 12, Figure 2-1.

141. SCADA discloses that “[M]odern RTUs are essentially microcomputers with special equipment at one end to interface with the long-range communications link and with special equipment at the other end to interface with the sensors, actuators, and calculators in the process.” Ex. 1007, at 92-93.

142. SCADA discloses that “The RTU outputs an electrical signal that . . . is received by a transducer . . . to open or close the valve by an amount proportional to the current output by the RTU.” Ex. 1007, at 73.

143. A POSITA would recognize from the above disclosures that SCADA discloses instructions to control fluid-handling devices that monitor or control one or more fluids at an oil well, a petro water disposal or re-injection facility, or a petroleum pumping station, as recited in the ‘078 Patent.

144. A POSITA would recognize from the above disclosures that SCADA discloses receiving a plurality of user-directed instructions to control fluid-handling devices as recited in the ‘078 Patent. Therefore, Gutierrez discloses this limitation of the ‘078 Patent.

[1.3] obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions, wherein obtaining a target state of at least one of the fluid-handling devices based on at least some of the plurality of instructions comprises:

145. SCADA discloses that “the signal would be more likely to act as the remote set point of a PID (proportional/integral/derivative) controller,” and that output from the controller would control a valve, a louver, a machine speed, or any number of parameters that could be described by an analog value between 0 and 100 percent.” Ex. 1007, at 100-101.

146. A POSITA would understand that SCADA's disclosure of a signal acting as a set point and the serial transmission of bits for each pulse output is the obtaining a target state of the fluid-handling devices based on a plurality of instructions as claimed in the '078 Patent. Thus, SCADA discloses this claim element.

[1.4] after receiving the instructions, determining a plurality of different target states of the at least one of the fluid-handling devices, the plurality of different states each corresponding to different times;

147. SCADA discloses that the signal is used "as the remote set point of a PID (proportional/integral/derivative) controller, and the output from the controller would control a valve, a louver, a machine speed, or any number of parameters that could be described by an analog value between 0 and 100 percent" and "the pulse control method...allows a stepper motor to be incremented or decremented by a specified number of steps. Ex. 1007, at 100-01.

148. A POSITA would understand that SCADA's disclosure of the set point signal and analysis of the controller output is the determining a plurality of different target states corresponding to different times claimed in the '078 Patent. Thus, SCADA discloses this claim element.

[1.5] for each of the plurality of instructions, selecting a respective protocol or protocols from among a plurality of protocols different from the shared protocol, wherein the respective fluid-handling device or devices to which the respective instruction is directed are responsive to the selected respective protocol or protocols, wherein at least some of the selected protocols are different from one another;

149. SCADA discloses that "[M]odern RTUs are essentially microcomputers with special equipment at one end to interface with the long-range communications link and with special equipment at the other end to interface with the sensors, actuators, and calculators in the process." Ex. 1007, at 92-93.

150. SCADA also discloses "there are several languages that can be used between field instruments and RTUs." Ex. 1007 p. 71 (describing physical wire communication). SCADA further discloses translators "called transducers in the process control industry...[that] change the language from electrical current (I) to air pressure (P)." Ex. 1007, at 71-72.

151. A POSITA would further understand from SCADA's disclosure of a protocol driver to translate communications with each of the RTUs and its disclosure of various protocol languages is the selecting of a protocol from a plurality of instructions from a plurality of different protocols claimed in the '078 Patent. Thus, SCADA discloses this claim element.

[1.6] after determining the plurality of different target states, translating each received instructions into one or more translated instructions encoded in the selected

respective protocol or protocols, the one or more translated instructions including the determined plurality of different target states; and

152. SCADA also discloses “there are several languages that can be used between field instruments and RTUs.” Ex. 1007, at 71 (describing physical wire communication). SCADA further discloses translators “called transducers in the process control industry...[that] change the language from electrical current (I) to air pressure (P).” Ex. 1007, at 71-72.

153. A POSITA would understand that the use of different protocols by the protocol driver requires that the protocols be translated (i.e., from electrical signals to control signals) and that the translated instructions include the determined plurality of different target states as claimed in the ‘078 Patent. Thus, SCADA discloses this claim limitation.

[1.7] sending each translated instructions to at least the fluid-handling device to which the respective translated instruction is directed, wherein at least some of the translated instructions are effective to cause the at least one of the fluid-handling devices to attempt to achieve the target state

154. SCADA discloses that at “the center is the operator, who interfaces with the system through some form of input/output (I/O) device[, which] in turn communicates with the master terminal unit (MTU) [that communicates with] one

or more remote terminal units (RTUs), each of which communicates with sensors or actuators at the process” site. Ex. 1007, at 12, FIG. 2-1.

155. SCADA discloses that “[M]odern RTUs are essentially microcomputers with special equipment at one end to interface with the long-range communications link and with special equipment at the other end to interface with the sensors, actuators, and calculators in the process.” Ex. 1007, at 92-93. SCADA discloses that “The RTU outputs an electrical signal that . . . is received by a transducer . . . to open or close the valve by an amount proportional to the current output by the RTU.” Ex. 1007, at 73.

156. A POSITA would understand that SCADA’s disclosures of a protocol translator and a network interface for routing connection between a host and remote subsystems are the sending the translated commands as claimed in the ‘078 Patent. Thus, SCADA discloses this claim element. As such, Claim 1 is anticipated by SCADA or would be obvious to a POSITA in view of SCADA.

c. Claim 11

157. Almadi discloses the elements of Claim 1 for the reasons discussed above and incorporated herein.

158. SCADA discloses at least some of the received instructions identify an automatic mode in which a collection of target states are computed to operate within process constraints through its disclosure that “automatic control happens when a

system senses that a process variable has changed and modifies a control parameter without bringing a human operator into the decision. An example in an electric power transmission system is the automatic arming of a local load-shedding device to protect a transmission line from overloading only under very specific conditions that could be detected by the SCADA system.” Ex. 1007, at 199.

159. A POSITA would understand from SCADA’s disclosure automatic control is the automatic mode in which a collection of target states is computed as claimed in the ‘078 Patent. As such, Claim 11 is anticipated by SCADA or would be obvious to a POSITA in view of SCADA.

d. **Claim 12**

160. Almadi discloses the elements of Claim 1 for the reasons discussed above and incorporated herein.

161. SCADA discloses that the received instructions correspond to a manual mode in which an individual one of the fluid-handling devices is remotely controlled by a user through its disclosure that remote control occurs when a decision to modify a control parameter is carried out at a significant distance from the process. Ex. 1007, at 199.

162. A POSITA would understand from the above SCADA disclosures that the on-demand time modification of control parameters is the manual mode in which

an individual fluid-handling device is controlled by a user. As such, Claim 12 is anticipated by SCADA or would be obvious to a POSITA in view of SCADA

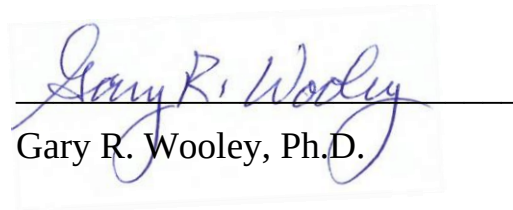
VII. CONCLUSION

163. For the reasons set forth above, in my opinion, all of the limitations of claims 1-8, 11-13, and 15-19 of the '078 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 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: February 27, 2025



Gary R. Wooley, Ph.D.