

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HALLIBURTON ENERGY SERVICES, INC.

Petitioner

v.

U.S. WELL SERVICES, LLC

Patent Owner

Case No. IPR2022-00074

Patent 10,254,732

**DECLARATION OF WILLIAM D. MARSCHER, P.E.
IN SUPPORT OF NON-CONTINGENT MOTION TO AMEND**

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EXHIBIT LIST

Petitioner's Exhibits

Exhibit	Description
1001	U.S. Patent No. 10,254,732 to Jared Oehring et al. (filed August 12, 2016 and issued April 9, 2019") ("732 Patent" or "Challenged Patent")
1002	Declaration of Dr. Robert A. Durham in Support of Petition for <i>Inter Partes Review</i> of U.S. Patent No. 10,254,732 with CV attached as Appendix A ("Durham Decl.")
1003	File History of U.S. Patent No. 10,254,732 (App. No. 15/235,715) ("732 Patent File History")
1004	U.S. Patent Publication No. 2014/0138079 to Joel N. Broussard et al., entitled "System for Pumping Hydraulic Fracturing Fluid Using Electric Pumps" (filed as App. No. 13/679,689 on Nov. 16, 2012 and published May 22, 2014) ("Broussard")
1005	U.S. Patent Publication No. 2008/0236818 to Jason D. Dykstra, entitled "Method and Apparatus for Controlling the Manufacture of Well Treatment Fluid" (filed as App. No. 11/691,623 on Mar. 27, 2007 and published Oct. 2, 2008) ("Dykstra-818")
1006	U.S. Patent Publication No. 2009/0078410 to David Krenek et al., entitled "Aggregate Delivery Unit" (filed as App. No. 12/212,698 on September 18, 2008 and published March 26, 2009) ("Krenek")
1007	U.S. Patent Publication No. 2011/0061855 to Leonard R. Case et al., entitled "Electric or Natural Gas Fired Small Footprint Fracturing Fluid Blending and Pumping Equipment" (filed as App. No. 12/774,959 on May 6, 2010 and published March 17, 2011) ("Case")
1008-1011	Reserved
1012	U.S. Provisional Application No. 62/204,331 (filed August 12, 2015) ("Provisional")
1013	U.S. Patent No. 10,337,308 to Joel N. Broussard et al., entitled "System for Pumping Hydraulic Fracturing Fluid Using Electric Pumps" (filed as App. No. 15/202,085 on July 5, 2015 and issued July 2, 2019) ("308 Patent")
1014	Eugene A. Avallone et al. Marks' Standard Handbook for Mechanical Engineers, 11 th ed. (McGraw-Hill: 2007) ("Marks")

Exhibit	Description
1015	U.S. Department of Labor, OSHA-NIOSH Hazard Alert: “Worker Exposure to Silica during Hydraulic Fracturing” (DSTEM 6/2012) (“OSHA-Silica”), available at: https://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.pdf ; https://www.osha.gov/publications/bytype/hazard-alerts ; https://web.archive.org/web/20120808200919/http://osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html
1016	Declaration of Duncan Hall of Internet Archive, authentication Exhibits 1017-1025 (October 26, 2021)
1017	Amazon.com listing for StarTech NETRS2321E 1 Port RS-232/422/485 Serial over IP Ethernet Device Server by StarTech (May 31, 2014), available at: https://web.archive.org/web/20140531134153/http://www.amazon.com/StarTech-NETRS2321E-RS-232-Serial-Ethernet/dp/B000YB0NOS
1018	Amazon.com listing for StarTech 1 Port RS-232 Serial to IP Ethernet Converter (NETRS2321P) by StarTech (Oct. 9, 2014), available at: https://web.archive.org/web/20141009001416/http://www.amazon.com/80/StarTech-com-Serial-Ethernet-Converter-NETRS2321P/dp/B00FJEHNSO
1019	Amazon.com listing for TCP/IP Ethernet to Serial RS232 RS485 RS422 Converter by Atc (Feb. 1, 2014), available at: https://web.archive.org/web/20140201040954/http://www.amazon.com/Ethernet-Serial-RS232-RS485-Converter/dp/B00ATV2DX2
1020	Amazon.com listing for SainSmart TCP/IP Ethernet to Serial RS232 RS485 Intelligent Communication Converter by SainSmart (Aug. 17, 2014), available at: https://web.archive.org/web/20140817185945/http://www.amazon.com/SainSmart-Ethernet-Intelligent-Communication-Converter/dp/B008BGLUHW
1021	Amazon.com listing for Global Cache iTach, IP to Serial with PoE (IP2SL-P) by Global Cache (Oct. 30, 2014), available at: https://www.archive.org/web/20140130235158/https://www.amazon.com/Global-Cache-iTach-Serial-IP2SL-P/dp/B003BFVNS4
1022	Moxastore website, listing for Moxa 802.11 Ethernet to Serial (May 24, 2016), available at:

Exhibit	Description
	https://web.archive.org/web/20160524091422/http://www.moxastore.com/Moxa_802_11_Wi-Fi_Ethernet_to_Serial_s/587.htm
1023	Moxastore website, homepage (Feb. 15, 2015), available at: https://www.archive.org/web/20150215072301/http://www.moxastore.com/
1024	Moxastore website, about us (Mar. 8, 2015), available at: https://web.archive.org/web/20150308182528/http://www.moxastore.com/aboutus.asp
1025	Moxastore website, listing for NPORTIA5250 (Mar. 8, 2015), available at: https://web.archive.org/web/20150308190810/http://www.moxastore.com/NPORTIA5250_p/nportia5250.htm

Patent Owner's Exhibits

Exhibit	Description
2001	U.S. Patent No. 9,410,410 to Broussard (filed Nov. 16, 2012) (the “’410 Patent”)
2002	U.S. Patent No. 10,337,308 to Broussard (filed July 5, 2012) (the “’308 Patent”)
2003	U.S. Patent No. 7,494,263 to Dykstra (filed May 3, 2005) (“Dykstra-263”)
2004	U.S. Patent Publication No. 2007/0201305 (filed Feb. 27, 2006) (“Heilman”)
2005	U.S. Patent No. 10,408,031 to Oehring (filed Oct. 15, 2018) (the “’031 Patent”)
2006	U.S. Patent No. 10,408,030 to Oehring (filed Jul. 18, 2017) (“’030 Patent”)
2007	Alden Abbott <i>et al.</i> , <i>Crippling the Innovation Economy: Regulatory Overreach at the Patent Office</i> , released by the Regulatory Transparency Project of the Federalist Society, August 14, 2017, https://regproject.org/wp-content/uploads/RTP-Intellectual-Property-Working-Group-Paper.pdf
2008	Paul R. Michael, Testimony Before Committee on the Judiciary, U.S. House of Representatives, <i>The Impact of Bad Patents on American Business</i> , July 13, 2017,

Exhibit	Description
	https://www.judiciary.senate.gov/imo/media/doc/Michael%20Testimony.pdf
2009	Steven Carlson, Landslide, <i>Weaponizing IPRs</i> (Vol. 12 No. 1 Sept./Oct. 2019), https://www.robinskaplan.com/-/media/pdfs/weaponizing-iprs.pdf?la=en
2010	Excepts of File History for U.S. Patent No. 9,410,410
2011	Liz Hampton, <i>Low-cost fracking offers boon to oil producers, headaches for suppliers</i> , BUSINESS NEWS (Sept. 12, 2019, https://www.reuters.com/article/uk-usa-oil-electric-fracturingfocus-idUKKCN1VX11E)
2012	Declaration of Richard Schaaf
2013	<i>U.S. Well Services LLC v. VoltaGrid, et al.</i> , Motion for Preliminary Injunction and Request for Hearing filed Nov. 4, 2021
2014	Declaration of William D. Marscher with curriculum vitae

I, William D. Marscher, P.E., hereby declare under penalty of perjury that the following statements are made based on my personal knowledge and are true and correct.

1. I am over twenty-one years old and am fully competent to make this declaration. I understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001). All statements made on my own knowledge are true and all statements made on information and belief are true.

I. SCOPE OF THE ENGAGEMENT

2. I have been retained by Patent Owner as an independent technical expert to provide analysis and opinion in connection with IPR2021-00074, including a Non-Contingent Motion to Amend.

3. This Declaration sets forth the opinions that I have formed based on my personal knowledge, education, research, personal and professional experience, and the information I have reviewed as of the date of this Declaration. In connection with my analysis, I have reviewed the exhibits listed in the above list of exhibits as well as information from my past education and experience. The opinions stated in this declaration are from the perspective of a person of ordinary skill in the art (POSITA). In forming my opinions, I have reviewed the Challenged Patent, its prosecution history, the materials cited in the List of Exhibits, and the materials cited throughout my Declaration.

4. I am being compensated at my normal hourly rate of \$508 for my work in this proceeding, including studying this matter and preparing this Declaration. My compensation is not contingent upon the outcome of this proceeding or the particular testimony or opinions that I express. I have personal knowledge of the facts stated in the Declaration, and I am willing to competently testify to them if and when called to do so.

5. Between now and such time that I may be asked to testify, I expect to continue my review, evaluation, and analysis of evidence presented during this proceeding. I expressly reserve the right to amend or supplement this report, as appropriate. In the event that additional relevant information becomes available to me, I also reserve the right to review and consider that information in further developing or refining my opinions.

II. PROFESSIONAL BACKGROUND AND QUALIFICATIONS

6. I am employed as the CEO and Senior Consultant of the machinery consulting and independent rotating machinery company Mechanical Solutions, Inc. (“MSI”), performing engineering work in the field of pumps and their fluid and structural systems, and electric motors. As CEO and Senior Consultant of MSI, my typical work responsibilities include leading MSI’s technical team in the design, analysis, and testing of all types of machinery used in plants and oil fields, as well as other

types of fluid and mechanical systems. As provided in greater detail below, I have a background in all types of pumps and motors.

7. In 1970, I received my Bachelor of Science degree in Mechanical Engineering from Cornell University. Then in 1972, I received my Master of Engineering degree in Mechanical Design also from Cornell University. I also earned a Master of Science degree in Applied Mechanics from Rensselaer Polytechnic Institute in 1976.

8. After receiving my Bachelor of Science degree in Mechanical Engineering, I worked as a senior engineer for the Bendix Fuel Injection and Fuel Pump Division (now a Honeywell division), a senior engineer for Pratt & Whitney commercial aircraft engine division, a project engineer for Creare R&D, Director of Mechanics (mechanical engineering) for Worthington Pump HQ, and Manager of Engineering Mechanics for Dresser Worthington Pump Division (later became Ingersoll-Dresser Pump and now Flowserve) after its acquisition of Worthington. I was chief mechanical engineer for Worthington and Dresser Pump, at a time when each respective company was one of the world's largest manufacturers of reciprocating as well as centrifugal pumps, with applications including deep-well vertical turbine pumps. I was an active participant in supervising design and development of these pumps for Worthington, as well as their analysis and on-site application and field testing. Later, I became vice president of the independent pump and turbomachinery

developer Concepts NREC, from which 25 years ago, I spun off Mechanical Solutions, Inc. as an independent pump and turbomachinery technology company.

9. For 22 years, I have been one of the U.S. voting representatives on the International Standards Organization (“ISO”) committee concerning, among other issues, pump dynamic behavior and acceptance standards. I am a past president of the Society of Tribologists & Lubrication Engineers, the primary technical society worldwide for the study of bearings, seals, wear, and erosion issues in machinery, and prior to this was the chairperson of the STLE Wear Technical Committee, and of the Sealing Technical Committee, the main concern of which was pump, compressor, and turbine seals. For the past 42 years, I have been a voting member of the ASTM Wear & Erosion Standards Committee, as well as the Metal Fatigue Standards Committee. I am also the past Board of Directors Chairperson for the Machinery Failure Prevention Technology Society (MFPT) of the Vibration Institute. I am a 20-year member of the Texas A&M Pump Users Symposium Advisory Committee (essentially the Board of Directors for the Symposium). I am a charter Standards Partner for the Hydraulic Institute (“HI”), the trade association for the pump industry, am past Vice Chair of the pump vibration technical committee for HI, and was HI Standards Partner of the Year for 2018, based on my significant roles in the ANSI/HI 9.6.4 and new 9.6.8 standards for pumps. I also won the

Vibration Institute MFPT 2019 Frarey Award for Machinery Diagnostics Excellence.

10. I contributed to and served as a reviewer for the first and second editions of the U.S. Department of Energy (“DOE”) and Hydraulic Institute’s pump sourcebook titled, Improving Pumping System Performance—A Sourcebook for Industry, the second edition of which was published in 2006.

11. I have also written twelve handbook chapters for various major engineering handbooks, which focus on pump and turbomachinery mechanical issues, including mechanical behavior, sealing, and component wear and erosion. For instance, the chapter that I authored for the ASM Materials Handbook focused on pump erosion and wear for centrifugal and reciprocating pumps. I was the primary author on pump dynamic and mechanical behavior, for the McGraw-Hill Pump Handbook, 4th Edition, Edited by Karassik et al. I co-authored the Vibration chapter of the well-known Sanks Pumping Station Design Handbook. Further, I have been the associate editor of the Society of Tribologists and Lubrication Engineers’ Tribology Transactions magazine for 18 years.

12. I am an inventor on six U.S. Patents and one European Patent, including patents concerning pump and turbine sealing. I have also taught short courses and tutorials on a number of pump topics at leading institutions in the United States and

around the world. I am a registered and licensed Professional Engineer in New Jersey (License No. 40626).

13. My experience and qualifications are further provided in my curriculum vitae, which is attached to this Report. My curriculum vitae also provides a select listing of my publications and the legal cases in which I have been involved over the last 12 years. *See* Appendix A.

14. The bases for my opinions include the following: (i) my education as a degreed mechanical engineer and licensure as a professional engineer in New Jersey; (ii) my over 50 years of experience in the design, performance, maintenance, and troubleshooting of pumps and motors, and related machinery; (iii) my previous experience in troubleshooting pumps in the field; and (iv) my review of certain documents as detailed herein.

15. On the basis of my education and the personal and professional experiences described above and set forth in my curriculum vitae, I believe I am qualified to give the opinions set forth herein.

III. LEGAL STANDARDS

16. I am not an attorney, but I am informed and understand that a person having ordinary skill in the art (“POSITA”) is a hypothetical person who is presumed to

know the relevant prior art. For purposes of this Response, USWS has used Petitioner's proposed definition of a person of ordinary skill in the art.

17. I understand that the first step in determining whether a patent claim would have been anticipated or obvious is to ascertain how a POSITA would have understood the claim terms.

18. I have been informed that, for this proceeding, claims of a patent are to be construed given the meaning the term would have to the POSITA in view of the patent specification and the patent's file history.

19. I have been informed and understand that claims are anticipated by a prior art reference if each and every element of the claim is found, either explicitly or inherently, in a single prior art reference. I understand that a patent claim may be obvious in view of a single reference, or a combination of references, and that these references may be used to collectively show disclosure of all elements of a claim.

I have been informed and understand that a claim may be invalid if differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made. To assess obviousness, I have been informed and understand that I am to consider the scope and content of the prior art, differences between the prior art and the claim, the level or ordinary skill in the art, and any secondary considerations of nonobviousness.

IV. SUMMARY OF OPINIONS

20. Opinion 1: As I explain further herein, it is my opinion that the Petitioner is incorrect in challenging the validity of the various claims of the '732 patent. The PTO made the appropriate decision in granting the '732 patent. However, the patent would benefit from the proposed amended claims.

21. Opinion 2: The references cited by the Petitioner do not disclose the amended or retained features of the amended two claims, specifically Claim 14 and Claim 21. For example, the control box with the circuitry and then a separate container camera, as represented in Claim 14 and illustrated in original Fig. 2, are not provided in the cited references.

22. Opinion 3: With regard to the amended language of Claim 14 concerning the first and second serial transceivers and their relationship to the data converters and information handling system (IHS) in the control box, this concept is present in the original patent body column 6 lines 55-60, and not disclosed with specificity in any of the references, or their valid combination.

23. Opinion 4: With regard to amended Claim 21 disclosing gate positioning, in the original patent the gate is shown in Fig. 1 and Fig. 2, and the control of the gate is disclosed in the body of the original '732 Patent in column 4 lines 61-65. Gate automated positioning is implied, but not explicitly taught, in *Case*, and is not present in other references.

24. Opinion 5: *Dykstra* deals with fracking fluid preparation and delivery, but does not disclose any of the elements of the amended claims. He does not teach about measuring the weight of proppant in a proppant storage container.

25. Opinion 6: Both *Broussard* '079 as well as the '732 Patent implement electrically-driven fracking pumps. The *Broussard* '079 patent does not speak to any of the unique teachings of the '732 Patent, and in particular does not teach about proppant control, IHS systems, or cameras as sensors, and does not cover the items discussed in the amended claims.

26. Opinion 7: *Krenek* '410 discloses use of a feedback control system to monitor and control solid aggregate, such as proppant. There is no mention of video cameras. A feedback control system is simply mentioned as a concept, and there is no mention in *Krenek* about ethernet, serial transmitters and receivers, control boxes and their power supplies, or IHS systems and their software.

27. Opinion 8: The primary goal of *Case* is mixing/ blending of multiple species with an IMSBS, not focus on control of the proppant. His claims strictly focus on operation of blending pumped fluid mixtures.

28. Opinion 9: The Petitioner highlighting of computer and network products and services available from Amazon and Moxastore, including the StarTech ethernet

device, is irrelevant. The '732 Patent is not disclosing custom electronic design of the IHS, wireless, or ethernet components, or details of the software architecture, but is disclosing the unique combination of such for monitoring and controlling proppant delivery.

29. Opinion 10: In summary, the amended features of the '732 patent would not be obvious in view of the references. The petition uses conclusory language of the expert report and demonstrates lack of specificity in applying the cited references.

30. Opinion 11: The combination of references cited by the Petitioner is based on hindsight reconstruction.

V. BACKGROUND

31. USWS is a market-leading provider of electric hydraulic fracturing systems, services, and products to exploration and production companies, and invented a revolutionary, one-of-a-kind high pressure all-electric fracturing systems, eventually known as Clean Fleet®. USWS's Clean Fleet® product and related electric-fracturing fleet technology was developed in the early stage of the electrical fracturing industry, and USWS was the first in the industry to successfully utilize electric motors and electrically-driven pumps in an all-electric high-pressure well stimulation system. USWS has continued to further develop, refine, and

commercialize the Clean Fleet® product and related electric-fracturing fleet technology. The Clean Fleet® product comprises electric pumps powered by at least one electric motor and a VFD connected to the electric motor. USWS's claimed invention (*e.g.*, Clean Fleet® product) succeeded where others had failed.

32. On April 15, 2021, USWS filed a lawsuit against Petitioners for infringement of the '732 Patent and six other patents in the United States District Court for the Western District of Texas, Waco Division ("WDTX"). *See U.S. Well Services, Inc. v. Halliburton Co.*, Case No. 6:21-cv-00367-ADA. Since USWS filed suit, Petitioners have filed fifteen IPR petitions challenging fifteen separate patents owned by USWS. Petitioners filed this present Petition on Nov. 8, 2021.

33. Petitioner has filed Petitions for IPR against these patents: IPR2021-01032 against U.S. Pat. No. 9,410,410; IPR2021-01034 against U.S. Pat. No. 10,337,308; IPR2021-01033 against U.S. Pat. No. 8,789,601; IPR2021-01035 against U.S. Pat. No. 9,970,278; IPR2021-01036 against U.S. Pat. No. 9,611,728; IPR2021-01037 against U.S. Pat. No. 9,745,840; IPR2021-00074 against U.S. Pat. No. 10,408,030; IPR2021-01065 against U.S. Patent No. 9,840,901; IPR2021-01066 against U.S. Patent No. 10,020,711; IPR2021-01238 against U.S. Patent No. 10,526,882; IPR2021-01315 against U.S. Patent No. 9,893,500; IPR2021-01316 against U.S. Patent No. 10,280,724; IPR2021-01538 against U.S. Patent No. 10,408,031; and IPR2021-01539 against U.S. Patent No. 10,648,311.

34. The '732 Patent was filed as App. No. 15/235,716 (the "'716 Application") on Aug. 12, 2016 and claims priority as follows:

1. Continuation-in-part of U.S. Patent Application No. 15/202,085 filed on July 5, 2016 (the "'085 Application") and issued on July 2, 2019 as U.S. Patent No. 10,337,308.
2. The '085 Application is a continuation of U.S. Patent Application No. 13/679,689, filed on Nov. 16, 2012 (the "'689 Application") and issued on Aug. 9, 2016 as U.S. Patent No. 9,410,410.
3. The '732 Patent also claims priority to U.S. Provisional Patent Application No. 62/204,331 (the "Provisional"), which was filed on August 12, 2015.

35. The '732 Patent discloses a "system and method that remotely monitors and controls proppant usage in a fracturing operation." [Ref. '732 Patent abstract]. During hydraulic fracturing, the fracturing fluid that is pumped down into the well includes a proppant that is a solid particulate such as sand or ceramic beads. In many known fracking systems, proppant, such as sand, glass beads, ceramic material, bauxite, dry powders, rock salt, fiber material, or cement plastics, is mixed with other materials and enhances the flow capacity of the fractures. The proppant props open the fractures and remains in the fractures after the end of the hydraulic fracturing operation.

36. The system and method of the '732 Patent "allow operators to wirelessly monitor and control proppant storage units from inside a datavan through sensors and control mechanisms that interface with fracturing software to schedule the flow of the proppant." [Ref. '732 Patent abstract]. This system is mobile and fully electric. The invention is particularly beneficial for improving the fracturing industry. The teachings of the '732 Patent are generally directed to an all-electric, mobile, high pressure, well stimulation system in the fracturing industry, in a manner that is novel, teaching the use of improved sensing methods and process automation where none existed in prior art that had been implemented in the field.

37. The patent owner of 10,254,732 is proposing to amend certain patent claims with regard to its remote proppant monitoring system, by implementing a Non-Contingent Motion to Amend, amending the claims to incorporate additional features not found in the prior art references. The proposed amendments are listed below, with amendments indicated by underlining of the text, and deletions in double brackets :

38. Claim 14: (Substitute for Claim 1) A system for use with a fracturing operation comprising:

a plurality of electric-powered pumps fluidly connected to a well and
powered by at least one electric motor, and configured to pump fluid into the

well at high pressure so that the fluid passes from the well into the formation, and fractures the formation; and

a variable frequency drive connected to the electric motor to control the speed of the motor, wherein the variable frequency drive frequently performs electric motor diagnostics to prevent damage to the at least one electric motor;

a weight monitoring system in selective cooperation with a proppant container that selectively contains proppant used in fracturing;

an information handling system in communication with the weight monitoring system;

[[and]] a proppant dispensing system coupled with the proppant container and that is in communication with and selectively activated by the information handling system;

a control box coupled to the proppant container, comprising:

a first serial transceiver in communication with the weight monitoring system and a data converter coupled to the first serial transceiver; and

a second transceiver coupled to the data converter, the second transceiver to provide converted data to the information handling system from the data converter;

and a camera associated with the proppant dispensing system positioned to monitor a position of a gate of the proppant dispensing system.

39. Claim 21: (Substitute for Claim 8) A method for conducting a fracturing operation comprising:

pumping fluid with a plurality of electric-powered pumps into a wellbore at high pressure so that the fluid passes from the wellbore into the formation, and fractures the formation;

controlling ~~[[the]]~~ a speed of an electric motor powering ~~powered~~ the electric-powered pumps with a variable frequency drive, wherein the variable frequency drive frequently performs electric motor diagnostics to prevent damage to the electric motor;

sensing an amount of proppant contained in at least one proppant storage container;

comparing the amount of proppant sensed in the proppant storage container with a designated amount of proppant;

~~[[and]]~~ regulating a flow of proppant from the proppant storage container based on the step of comparing the amount of proppant sensed and the designated amount of proppant;

determining, using a camera associated with the at least one proppant storage container, a position of a gate used to regulate the flow of the proppant;

determining the position of the gate corresponds to an open position; and causing a remediation action to be performed when the open position is indicative of a failure.

VI. DISCUSSION

40. I am informed and understand that a person having ordinary skill in the art (“POSITA”) is a hypothetical person who is presumed to know the relevant prior art. For purposes of this Response, USWS has used Petitioner’s proposed definition of a person of ordinary skill in the art (“POSITA”). I understand that the first step in determining whether a patent claim would have been anticipated or obvious is to ascertain how a POSITA would have understood the claim terms.

41. Petitioner challenges the patentability of the Challenged Claims based on five references: *Broussard*, *Dykstra-818*, *Case*, *Krenek*, and *StarTech*, utilized in six grounds.

42. Petitioner asserts the following challenges to the Challenged Claims, all per §103:

Ground	'732 Claims	References/Basis for Challenge
1	1-13	Broussard in view of Dykstra-818

2	1-8, 11-13	Broussard in view of Dykstra-818, in view of Case
3	1-13	Broussard in view of Krennek
4-6	2	Each of the above grounds, further in view of StarTech (Ex. 1018)

43. The cited references do not disclose the amended or retained features of the amended two claims, specifically Claim 14 and Claim 21.

44. For example, the control box with the circuitry and then a separate container camera, as represented in Claim 14, are not provided in the cited references, but are presented in the Fig. 2 as items **204** (control box) and **236** (camera), as discussed in context in the body of the original patent in column 8, lines 1315.

45. As another example, using the camera as a key sensing element is disclosed in both Claims 14 and 21, but is not present in the references. In the original '732 patent, the camera use is taught as item **236** of Fig. 2, and discussed in context in the body of the patent, in column 8 line 13.

46. With regard to the amended language of Claim 14 concerning the first and second serial transceivers and their relationship to the data converters and information handling system (IHS) in the control box, this concept is present in the original patent body column 6 lines 55-60: "In the example of FIG. **2**, the information is transmitted after it is sent from the sensor **218** via analog connection from a serial transceiver **226** to another serial transceiver **228** in the control box **204**. The information is then sent through a serial connection to another information handling system (IHS) **234** in the control box **204**." In column 6, lines 62 to 64, the

‘732 Patent further states “The IHS **234** then selectively converts the data through a serial to Ethernet converter **210**”.

47. With regard to amended Claim 21 disclosing gate positioning, in the original patent the gate is shown as item **120** in Fig. 1, and **220** in Fig. 2, and the control of the gate as taught in Claim 21, i.e. automatic actuation of gate position based on information from the sensor, is disclosed in the body of the original ‘732 Patent in column 4 lines 61-65.

48. *Dykstra* deals with fracking fluid preparation and delivery, but does not disclose any of the elements of the amended claims. He is concerned with controlling flow of liquids and gels, not particulate flow per se. As such, he speaks of controlling valves, not gates. He does speak loosely of measuring height of a mix including proppant in a blender tub, but not about measuring the weight of proppant in a proppant storage container, or using advanced sensing methods to quantify proppant or its flow rate, such as a video camera. Overall, *Dykstra* is directed toward a centralized location of materials, as shown in FIG. 1, and there is no teaching or motivation to incorporate the specific circuitry and monitoring into the individual tanks. For example, the large “Operations Factory 100” requires an extra manifold assembly, as well as substantial additional length (and associated “alleys”, i.e. real estate pathways) of piping and conveyor belts. This would increase the footprint of the fracturing site, which the POSITA would recognize as an undesirable

consequence of the system, especially when combined with *Broussard* '079 that seeks to reduce the footprint on site.

49. The *Broussard* '079 patent does not speak to any of the unique teachings of the '732 Patent, and in particular does not teach about proppant control, IHS systems, or cameras as sensors, and does not cover the items discussed in the amended claims. In any event, I am considering the *Broussard* '079 patent as part of the family of patents of the '732. This leads to some shared language and field-of-application concepts, but the teaching of the '732 Patent remains unique from *Broussard* '079. *Broussard* '079, as well as similar patent '308, is concerned with driving fracking pumps through use of electric motors, using VFD drives. The '732 Patent teachings would be applied in that context and environment, but beyond this provide new teachings than *Broussard* by providing a method for proppant automatic delivery and control. Both *Broussard* '079 as well as the '732 Patent implement electrically-driven fracking pumps, but this teaching is not central to the '732 Patent purpose or unique teachings, in my opinion.

50. *Krenek* discloses use of a feedback control system to monitor and control solid aggregate, such as proppant, in a fracking application. A weight device is used to determine amount of aggregate. The focus is on wireless monitoring and control, the design and modularity of the aggregate containers, conveyance to site on a trailer,

and the delivery to the blenders by conveyor belts. There is similarity of intent relative to the purpose of the '732 Patent, but the teachings are different. The sensing is by simple strain gage-based load cells, with no mention of advanced methods such as video cameras. The feedback control system is simply mentioned as a concept, as is the "wireless communication", with no detail provided concerning the components or methodology. There is no mention of ethernet. There is no mention in *Krenek* about serial transmitters and receivers, control boxes and their power supplies, or IHS systems and their software. *Krenek* has no interest in teaching about such matters which are prominent teachings in the '732 Patent.

51. *Case* does disclose not only weighing (again with load cells) the aggregate container and contents, as well as containers of other materials and contents, but also an IHS with monitoring and controlling software. However, the primary goal is mixing/ blending of multiple species, not focus on control of the proppant. As *Case* states in his first claim, he is disclosing "an integrated material blending and storage system" (in the patent body he calls it an "integrated material storage and blending system", IMSBS, in paragraph 21). In disclosing the details of his system in the list of claims, he does not even directly refer to proppants, not does he claim any IHS or transmitter/ receiver system, but is strictly focused on the operation of blending the pumped fluid mixture. Additionally, this focus on blending operations does not

illustrate the advanced monitoring techniques of the substitute claims, such as the camera.

52. I find the Petitioner's spotlighting of computer and network products and services available from Amazon and Moxastore curious, and irrelevant. This includes the referenced StarTech ethernet device. The '732 Patent is not disclosing the detailed electronic design of the IHS components, wireless transmission components, or ethernet network components, or the programming of its disclosed software concepts. It *assumes* these are available off-the-shelf. Rather, the '732 Patent is disclosing the combination of such components and software, for the purposes it lays out in the patent body, illustrates appropriately in its figures, and discloses distinctly in list form in its claims.

53. In summary, the amended features of the '732 Patent would not be obvious in view of the references. The petition does not provide an articulated rationale for combining the references, but uses conclusory language of the expert report and demonstrates lack of specificity in attempting to apply the cited references.

54. Furthermore, the combination of references cited by the Petitioner is based on hindsight reconstruction to first integrate features from several references into the proppant container design itself, and then to assert that the reference-disclosed sensors suggest the camera as a secondary visual monitor.

**VII. CLOSURE, AND COMMENT ON REVISION OR
SUPPLEMENTATION**

**IN THIS REPORT, I HAVE PRESENTED MY OPINIONS
REGARDING THE VALIDITY OF AMENDING THE CLAIMS OF
THE '732 PATENT BASED ON THE INFORMATION AVAILABLE
TO ME. MY OPINIONS ARE SUBJECT TO CHANGE IN VIEW OF
ANY ADDITIONAL INFORMATION THAT I MAY RECEIVE. I
RESERVE THE RIGHT TO SUPPLEMENT MY OPINIONS
ACCORDINGLY.**

**I HEREBY DECLARE THAT ALL STATEMENTS MADE HEREIN OF
MY OWN KNOWLEDGE ARE TRUE AND THAT ALL OPINIONS
EXPRESSED HEREIN ARE MY OWN; AND FURTHER THAT THESE
STATEMENTS WERE MADE WITH THE KNOWLEDGE THAT
WILLFUL FALSE STATEMENTS AND THE LIKE ARE PUNISHABLE
BY FINE OR IMPRISONMENT, OR BOTH, UNDER SECTION 1001 OF
TITLE 18 OF THE UNITED STATES CODE.**

**I DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF
THE UNITED STATES OF AMERICA THAT THE FOREGOING IS TRUE
AND CORRECT.**

William D. Marscher

William D. Marscher, P.E

August 5, 2022

APPENDIX A

William Donnelly Marscher, P.E.
Mechanical Solutions Inc.
CEO & Senior Consultant

William D. Marscher is employed as CEO and Senior Consultant of the machinery consulting and independent rotating machinery company Mechanical Solutions, Inc. (MSI), performing engineering work in the field of fluid systems and their rotating and reciprocating machinery, particularly pumps, compressors, turbines, and motors. His typical work responsibilities include leading MSI's technical team in design, analysis, and testing of all types of plant machinery, as well as other types of fluid and mechanical systems. Mr. Marscher has background in all types of pumps, including centrifugal (e.g. horizontal single & multiple stage as well as VTP vertical) as well as positive displacement (e.g. reciprocating, gear, rotary, diaphragm, and screw) pumps.

For 22 years, Mr. Marscher has been one of the U.S. voting representatives on the ISO (International Standards Organization) TC108 committee concerning, among other issues, pump dynamic behavior and acceptance standards. He is past president of the Society of Tribologists & Lubrication Engineers (STLE), the primary technical society worldwide for the study of bearings, sealing, wear, and erosion issues in machinery. For the past 42 years he has been a voting member of the ASTM Fatigue Standards Committee, as well as the ASTM Wear & Erosion Standards Committee. He is also the past Board of Directors Chairman for the Machinery Failure Prevention Technology Society (MFPT) of the Vibration Institute. Mr. Marscher is an 20 year member of the Texas A&M Pump Users Symposium Advisory Committee (essentially the Board of Directors for the Symposium). For ASME, Mr. Marscher was Chair of the Predictive Maintenance committee, and was Organizing and Presiding Chair of the 1993 RoCon Rotating Machinery Conference and the 1995 Tribology Conference.

Mr. Marscher has written twelve handbook chapters for various major engineering handbooks, which have focused on pump and turbomachinery mechanical issues, including dynamics and vibration. In previous employ, he was a senior instrumentation and controls engineer for the Bendix Fuel Pump and EFI Division (maker of automotive electric motor driven plunger/piston pumps and fuel injection systems, now a Honeywell division), a senior engineer for Pratt & Whitney Aircraft Engines, Director of Mechanics (Mechanical Engineering) for Worthington Pump HQ, and Manager of Engineering Mechanics for Dresser Worthington Pump Division after their acquisition of Worthington. Later, he was VP of the independent pump and turbomachinery developer Concepts NREC, from which 25 years ago he spun off Mechanical Solutions, Inc. as an independent pump and turbomachinery technology company. At MSI, he was a principal in the USAF project for paralleling control of motors/generators. He is a charter Standards Partner for the Hydraulic Institute (HI), the trade association for the pump industry, became Vice Chair of the pump vibration technical committee for HI, and was HI Standards Partner of the Year for 2018, based on playing a significant role in the 9.6.4 and new 9.6.8 standards. He also won the Vibration Institute MFPT Fraey Award for Diagnostics Excellence.

Education: B.S.M.E. Cornell University, 1970
Master Eng. (Mech. Des.) Cornell University, 1972

M.Sc. Applied Mechanics, Rensselaer Polytechnic Institute, 1976

Experience:

Bendix Corp., MI (now Honeywell), 1970- 1973, Engineer, instrumentation and controls system modeling, and advanced automotive pump development for fuel injection systems

Pratt & Whitney Aircraft, CT, 1973-1980, Senior Engineer, aircraft engine compressor and turbine section mechanical development, analysis, and testing

Dresser Worthington Pump Div., Dresser Industries, NJ, 1980-1992, Manager and Director, Mechanical Engineering

Concepts NREC, Inc., Norwich VT, 1992-1996, Vice President and Chief Mechanical Engineer

Mechanical Solutions, Inc., 1996- Present, Founder, CEO, and Senior Consultant

Honors:

NASA Fellow, Cornell University, 1971-1972, original Mars Rover Design project

1983 ASLE Best Technical Paper Award

1986 \$5000 Dresser Pump Creativity Award for Vibration Evaluation Methodology

Fellow & Past President, Society of Tribologists and Lubrication Engineers (STLE)

Fellow & Past President/ Board Chairman MFPT Engineering Society

Associate Editor for 18 years, STLE *Tribology Transactions* magazine

Chapters for 12 Technical Handbooks

Author of 6 U.S. Patents & 1 European Patent

Charter Standards Partner for the Hydraulic Institute, past V. Chairman Vibration Committee

2018 ANSI/HI Standards Partner of the Year

2019 Jack L. Frarey Machinery Diagnostics Achievement Award of the Vibration Institute/MFPT

Registered and Licensed Professional Engineer, State of New Jersey Lic. No. 40626

Publications and Short Courses

Mr. Marscher's twelve machinery handbook chapters include the 2nd and 3rd Edition of the Sanks Pumping Station Design Handbook, the structural engineering chapter for Sawyer's Gas Turbine Handbook, the Lubrication and Bearings section of The Modern Marine Engineer's Manual 3rd Edition, and the vibration test and predictive maintenance chapters for the CRC Lubrication & Tribology Handbooks, as well as the handbook pump and turbomachinery tribology chapter. He authored the pump mechanical behavior section of the McGraw-Hill Pump Handbook, 4th Edition, and the pump erosion and wear chapter for the ASM Materials Handbook. He has given short courses and tutorials on pump vibration and rotating machinery mechanical evaluation and troubleshooting twelve times over a period of more than 40 years at the Texas A&M Symposium, and also at the U. of Virginia, the von Karman Institute in Belgium, the Sumy Institute Ukraine, IMechE in London, STLE, and the Vibration Institute and MFPT. He has published a large number of refereed technical papers, and was co-author the book Centrifugal Pump Design & Application, published by Oxford University Press (Oxford, England).

Additional Selected Publications:

Marscher, W.D., "A Phenomenological Model of Abradable Seal Wear in High Performance Machinery", Wear Magazine, v. 59, 1980 pp. 191-211

Marscher, W.D., "A Critical Evaluation of the Flash Temperature Concept", ASLE Hodson Best Paper Award Winner, ASLE Annual Meeting, Preprint No. 81-AM-1D-3, May 1981

Marscher, W.D., "Thermal vs. Mechanical Effects in High Speed Sliding", Wear Magazine, v. 79, pp 129-143, 1982

Marscher, W. D., “*Test Simulation of Turbomachinery Rotor/ Stator Interactions at Seals,*” ASLE Annual Meeting, May 1982, featured article in Lubrication Engineering magazine, v. 39, no. 9, pp 577-583, September 1983.

Marscher, W.D., “*Structural Design and Analysis of Modern Turbomachinery Systems*”, Chap. 7, Sawyer's Gas Turbine Engineering Handbook, 3rd Ed., v. I, Turbomachinery Publications, Norwalk CT, c. 1985

Marscher, W.D., “*The Effect of Fluid Forces at Various Operation Conditions on the Vibrations of Pumps*”, Proc. IMechE, Radial Loads and Axial Thrusts, Feb 5 1986

Marscher, W.D., “*Determination of Pump Rotor Critical Speeds During Operation through Use of Modal Analysis*”, Proc ASME 1986 WAM Symposium on Troubleshooting Methods and Technology, Anaheim Cal, Dec 1986

Marscher, W.D., “*The Relationship Between Pump Rotor System Tribology and Appropriate Vibration Specifications*”, Proc IMechE 3rd European Congress on Fluid Machinery for the Oil and Petrochemical Industries, The Hague, Netherlands, May 1987

Marscher, W.D., “*Subsynchronous Vibration in Boiler Feed Pumps Due to Stable Response to Hydraulic Forces at Part Load*”, Proc IMechE Conf on Part Load Pumping Control and Behavior, Edinburgh Scotland, Sept. 1988

Marscher, W. D., “*Analysis and Test of Multistage Pump ‘Wet’ Critical Speeds,*” ASME/STLE Joint Lubrication Conference, 1989, Preprint 89-GT-6E-1, October 1989.

Marscher, W.D., “*The Effect of Variable Frequency Drives on Vibration Problems in Vertical Pumps*”, Proc. Water & Wastewater Conference, Barcelona, Spain, April 1990

Marscher, W.D., “*Vibration Test and Analysis of a Barrel Boiler Feed Pump Exhibiting Non-Synchronous Vibration*”, Proc IMechE Seminar on Vibrations in Pumps, London, Dec. 1990

Marscher, W.D., “*The Use of Impact Testing to Solve Vibration Problems in Power Plant Pumps,*” EPRI Reliability Symposium, Tampa, FL, June 1991.

Marscher, W.D., “*Advanced Vibration Analysis and Test Technology for Pumps,*” Conf. on Vibration and Sealing in Centrifugal Machinery, Sumy Technical Institute, Ukraine, Sept. 1991

Marscher, W.D., “*Make Vibration Monitoring Live Up to Its Potential*”, Power magazine, pp 54-57, July 1994

Marscher, W.D., “*Wear and Erosion of Pumps*” Chapter of the ASM Handbook, vol. 18, pp 65-1 to 65-9, c. 1995

Marscher, W.D., “*Vibration*” Chapter and “*Predictive Maintenance*” Chapters, STLE/CRC Tribology & Lubrication Handbook, STLE Park Ridge IL, 1994 & 1997

Marscher, W.D., “*Bearing Application and Lubrication*” Chapter, Modern Marine Engineer’s Manual 3rd Edition, Cornell Maritime Press Centreville MD, 1999

Marscher, W.D., “*Electric Current Modal Impulses to Detect Motor-Driven Pump Rotor Condition*”, Proc. 17th Int’l Modal Analysis Conf., Kissimmee FL, Feb. 1999

Marscher, W.D., “*The Determination of Rotor Critical Speeds While Pump Remains Operating, through Use of Impact Testing*”, IMAC Conf. Orlando FL, SEM, Feb. 1999

Marscher, W.D., “*Avoiding Failures in Pumps*”, Tutorial in Proc. TAMU International Pump Symposium, Houston TX, Feb. 2002

Marscher, W.D., “*The Relationship of Vibration to Problems in Pumps*”, Cover Story in Chemical Engineering magazine, pp 38-44, May 2004

Marscher, W.D., & Hogg, Stephen, “*Use of Non-Contact Acoustic Signals as Metrics for Machinery Diagnostics*”, Proc. 2006 MFPT Annual Meeting, Virginia Beach VA, May 2006

Marscher, W.D., “*An End-User’s Guide to Pump Rotordynamics*”, Proc. Texas A&M 23rd International Pump Symposium, Houston TX, March 2007, and presented annually since then up through Sept. 2020.

Marscher, W.D., and Kelly, W.J., “*Machinery Prognosis Based on Finite Element, Tribological, and Fatigue Analysis Calibrated by Test*”, Proc. 2009 MFPT Annual Meeting, Dayton OH, May 2009

Marscher, W.D., & Kelly, W.J., “*Advanced Diagnostics & Prognostics of Plant Machinery*”, Proc. 2010 MFPT Annual Meeting, Huntsville AL, April 2010

Marscher, W.D., “*Turbomachinery Tribology*” Chapter, STLE/CRC Tribology & Lubrication Handbook Vol.3, STLE Park Ridge IL, 2011

Marscher, W.D., “Vibration Detection Using Motion Magnification Video”, Vibration Institute Annual Meeting, New Orleans LA, 2018

Marscher, W.D., “Effects of Operating Pumps at Off-Design Flows and Speeds”, Hydraulic Institute Annual Meeting, Florida, 2018.

Marscher, W.D., Onari, M.M., Boyadjis, P.A., Olson, E.J., Lerche, A., “*Vibration of Pumps and Turbomachinery*”, Short Course Texas A&M International Pump Symposium, Houston TX, March 2002, and presented annually since then up through Sept. 2020

Present Confidential Legal Support Cases that Are Active:

1. 2021/2022 Rocket Turbopump Seal IP Case in California, expert witness/ report
2. 2021/2022 PGR case challenging patent for fracking pumps, two expert reports

Prior Legal Cases Last 12 Years:

1. 2021 Expert opinion (including extensive analysis and testing) and declaration regarding adequacy of pumps for water plant operations, in support of Bay County Michigan.
Attorney: Jeff M. Sangster, Sangster Kotz Wysocki PC, Detroit MI
Tel. 313-259-8300, jsangster@kotsangster.com
2. 2020/2021 Expert opinion, declaration, and deposition regarding validity of reciprocating pump patent for use in fracking operations.
Attorney: Stephanie Nguyen, Womble Bond Dickenson (US) LLP, Baltimore MD
Tel. 308-545-5873, Stephanie.Nguyen@wbd-us.com
3. 2019 Expert opinion, and declaration regarding City of Laredo TX vs. Patterson Pump concerning legal responsibility for reliability complaints about the pumps.
Attorney: Esteban Delgadillo, Royston Rayzor PC, Brownsville TX
Tel. 956-542-4377, Esteban.Delgadillo@roystonlaw.com
4. 2019 Expert opinion, declaration, and deposition regarding validity of reciprocating pump valve patent No. 7,121,812.
Attorney: Jessica E. Zilberberg, Carlson Gaskey & Olds, P.C., Birmingham Michigan
Tel. (248) 988-8360, jzilberberg@cgolaw.com
5. 2018 Expert opinion and deposition concerning Sulzer submersible pump failures due to problems in the pump specification requirements versus actual needs (the wrong flow rate was specified for the pump) and problems with the sump design. I supported Sulzer over a year's time in their successful defense. I was their primary technical witness.
Attorney: Michael Hanahan, Schiff Hardin LLP, Chicago IL, Tel: 312-258-5701.
6. 2018 Expert opinion and written declaration concerning failure of a Viking gear pump for the making of peanut butter cup candy, which resulted in gross contamination resulting in a great deal of lost product and an extended period of lost production, as well as clean-up and repair costs. The liability amounted to 16 million dollars. The system should have been outfitted with sensors and controls, and should have had a provision for venting of discharge overpressure to avoid such catastrophes. After two years of mediation, the claim was able to be settled for only one percent of the original claim. My testimony composed the primary argument for our ultimately successful case.
Attorney: Timothy Mattson, Frith Anderson & Peake, Roanoke VA, Tel. 540-725-3380.
7. 2018 Expert engineering guidance in a case involving a large skyscraper, advising concerning a valve that was part of a system that flooded the building because of improper

system design. Attorney: Len Lesser, Simon-Lesser PC, New York, NY, Tel: 212-599-5455.

8. 2017 Expert engineering guidance in a case involving a leakage in a cooling assembly and piping in another large skyscraper, advising concerning a pipe joint breakage that flooded the building because of disconnected alarms. Attorney: Len Lesser, Simon-Lesser PC, New York, NY, Tel: 212-599-5455
9. 2014 Expert testimony (2-day deposition as well as testify in court, and provide expert guidance) concerning a Moyno pump/ gear/ motor set that was not properly sized in accordance with specifications, leading to chronic trips. Testified at trial, 2014 Attorney: David Romyn, Castle Law Associates, Los Angeles CA.
10. 2014 Expert testimony, including Declaration, on behalf of Siemens in their “Longview” case concerning a large steam turbine generator enduring hydrogen seal failures. Attorneys were Robert Wolinsky, and David Michaeli, of Hogan Lovells, Washington DC.
11. 2013 Expert testimony, including Declaration, as well as detailed engineering calculations concerning a fire in an Aluminum plant in Qatar, which the Norwegian/British insurance company was refusing to pay the insurance money due because of relatively high prior vibration in a large fan assembly. The insurance company (which was the opposition) settled out of court for nearly the full amount due. Case was throughout most of 2013. Attorneys Vasilis Pappas and John Craig of Bennett-Jones of Calgary Alberta Canada.
12. 2012 Patent Declaration Concerning GIW Patent (Addie et al), DIVERTER FOR REDUCING WEAR IN A SLURRY PUMP, Filed: August 6, 2002, Examiner: Richard A. Edgar. W. Marscher provided expert testimony by declaration. Attorney: Scott Sudderth of Womble Carlyle Sandridge & Rice, PLLC, Winston-Salem NC.
13. 2010/2011 Evaluation of John Crane Mechanical Seal Failures in Sharpe Mixers, W. Marscher provided mechanical seal damage deposition and expert opinion/ declaration. Attorney: John Butler of Preg O'Donnell & Gillette PLLC, Seattle WA.

Prior Legal Cases Before 2010:

HARTLINE, DACUS, BARGER, DREYER, & KERN, LLP

6688 North Central Expressway, Suite 1000

Dallas, Texas 75230

Tel: 214-346-3723

Atty – Edward Davis

Dresser-Rand vs. Equistar Chemical Company. W. Marscher provided expert consulting and compressor design and impeller stresses, and was prepped for trial (settled in 2007 before testimony).

GRAHAM CURTIN, P.A.

4 Headquarters Plaza
Morristown, NJ 07962

Atty. – Tom Curtin- 973-401-7159

Case was about pulsating/ vibrating system including a positive displacement screw compressor that BASF claimed was a faulty design, 2005, W. Marscher provided expert consulting for Dover legal team. Case was Dover/A-C Compressor vs. BASF, Excessive Acoustic Pulsation/ Vibration of Screw Compressor System.

GROTEFELD & DENENBERG, L.L.C.

105 West Adams Street
Suite 2300
Chicago, IL 60603

Atty. - Shantel Woods – 312-601-2374

Case was NJ Building vs. the Sloan Flusher Valve Co., 2003,
W. Marscher provided expert consulting for NJ Building legal team, and performed deposition.

HOLCOMB & MAYTS, P.A.

Attorneys & Counselors at Law
106 S. Tampania Ave., Ste. 200
Tampa, FL 33609

Atty – Andrew Mayts - 813-874-8800

Case was Engine Systems, Inc. vs. Ingersoll-Dresser Pump Company, about 2002,
W. Marscher provided expert consulting for IDP legal team

ROETZEL & ANDRESS Law Firm

1 Seagate, Suite 999
Toledo, OH 43604-4504

Atty – Thomas Zaremba - 419-242-7985

Case was Nuclear Operating Co. v. Johnston Pump, about 2001,
MSI provided expert consulting for NOC legal team on Johnston Pump impeller failures at First Energy Perry Nuclear Plant

FAEGRE & BENSON LLP, Minneapolis MN

Atty. - Jerry Snider

Helicopter Engine Dynamometer, W. Marscher provided at-trial witness testimony in federal court for the Kahn Industries legal team, 1996

McNeer LLP, Clarksburg WV

Atty. - James Riley

Ionics RO Water Systems, T & T vertical pump and water-filled motor thrust bearing failures, W. Marscher provided at-trial witness testimony in state court for the Ionics legal team, 1996/1997