Abstract: Systems for stimulation of a formation include a variable frequency drive (116) configured to receive and output medium voltage power (118) and in communication with high pressure pump (112). A variable frequency drive actuates an electric motor (114) associated with the high pressure pump, such that the pumps pressurizes a fracturing fluid, proppant, or combinations thereof for flowing the fracturing fluid, proppant, or combinations thereof into the formation.
FRACTURING SYSTEM LAYOUTS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is related to:

II. United States Provisional Patent Application Serial Number 62/036,284, filed August 12, 2014;
III. United States Provisional Patent Application Serial Number 62/036,297, filed August 12, 2014;
IV. United States Application for Patent Application Serial Number 14/199,461, filed March 6, 2014;
V. United States Application for Patent Application Serial Number 14/511,858, filed October 10, 2014;
VI. United States Provisional Patent Application Serial Number 61/774,237, filed March 7, 2013;
VII. United States Provisional Patent Application Serial Number 61/790,942, filed March 15, 2013;
VIII. United States Provisional Patent Application Serial Number 61/807,699, filed April 2, 2013; and
X. United States Application for Patent Application Serial Number 14/735,745, filed June 10, 2015;
XI. United States Application for Patent Application Serial Number 14/511,858, filed October 10, 2014;
XII. United States Provisional Patent Application Serial Number 62/036,284, filed August 12, 2014;
XIII. United States Provisional Patent Application Serial Number 62/036,297, filed August 12, 2014;
XIV. United States Provisional Patent Application Serial Number 62/010,302, filed June 10, 2014; and

[0002] Each of the aforementioned applications are incorporated by reference in the entirety.

[0003] The application claims priority to:

XVI. United States Application for Patent Application Serial Number 14/735,745, filed June 10, 2015;
FIELD OF THE INVENTION

[0004] Embodiments usable within the scope of the present disclosure relate, generally, to systems and methods for flowing fluid in association with a wellbore, and more specifically, to systems and methods usable for performing fracturing operations on a formation to stimulate production (e.g., of hydrocarbons) therefrom.

BACKGROUND OF THE INVENTION

[0005] To stimulate and/or increase the production of hydrocarbons from a well, a process known as fracturing (colloquially referred to as "fracing") is performed. In brief summary, a pressurized fluid - often water - is pumped into a producing region of a formation at a pressure sufficient to create fractures in the formation, thereby enabling hydrocarbons to flow from the formation with less impedance. Solid matter, such as sand, ceramic beads, and/or similar particulate-type materials, can be mixed with the fracturing fluid, this material generally remaining within the fractures after the fractures are formed. The solid material, known as proppant, serves to prevent the fractures from closing and/or significantly reducing in size following the fracturing operation, e.g., by "propping" the fractures in an open position. Some types of proppant can also facilitate the formation of fractures when pumped into the formation under pressure.

[0006] Non-aqueous fracturing fluids have been used as an alternative to water and other aqueous media, one such successful class including hydrocarbon-based fluids (e.g., crude/refined oils, methanol, diesel, condensate, liquid petroleum glass (LPG) and/or other aliphatic or aromatic compounds). Hydrocarbon-based fracturing fluids are inherently compatible with most reservoir formations, being generally non-damaging to formations while creating acceptable fracture geometry. However, due to the flammability of hydrocarbon-based fluids, enhanced safety preparations and equipment are necessary when using such fluids for wellbore operations. Additionally, many hydrocarbon-based fluids are volatile and/or otherwise unsuitable for use at wellbore temperatures and pressures, while lacking the density sufficient to carry many types of proppant. As such, it is common practice to use chemical additives (e.g., gelling agents, viscosifiers, etc.) to
alter the characteristics of the fluids. An example a system describing use of liquid petroleum gas is described in U.S. Patent 8,408,289, which is incorporated by reference herein in its entirety.

[0007] Independent of the type of fracturing fluid and proppant used, a fracturing operation typically requires use of one or more high pressure pumps to pressurize the fracturing fluid that is pumped into a wellbore. Conventionally, such equipment is driven/powered using diesel engines, which can be responsible for significant quantities of noise, pollution, and expense at a worksite. Electric drive systems have been contemplated as an alternative to diesel engines; however, such systems require numerous pieces of equipment, extensive cabling and/or similar conduits, and typically utilize on-site power generation, such as a natural gas turbine engine. Use of turbine engines and similar equipment may be unsuitable when utilizing fracturing fluids that include flammable components. An exemplary electrically powered system for use in fracturing underground formations is described in published United States Patent Application 2012/0255734, which is incorporated by reference herein in its entirety.

[0008] A need exists for systems and methods for fracturing and/or stimulating a subterranean formation that can overcome issues of formation damage/compatibility, flammability, proppant delivery, and/or power supply.

BRIEF SUMMARY OF THE INVENTION

[0009] Embodiments usable within the scope of the present disclosure include systems and methods usable to perform fracturing operations on a formation using an electrically powered fracturing spread. FIGURE 1 enumerates numerous benefits relating to safety, economy, and sustainability of electrically powered fracturing systems.

[0010] A power source (e.g., a turbine generator and/or a grid-based power source) can be used to provide electrical power to one or more Variable Frequency Drives (VFDs), which in turn actuate electric motors, used to power associated high pressure pumps (e.g., fracturing pumps). The pumps are usable to pressurize a fracturing fluid (e.g., water, propane, or other suitable media, typically combined with proppant) prior to injection of the
pressurized fluid into a wellbore to fracture the underlying formation.

[0011] A high pressure pump can be subject to a maximum rate and/or torque at which the pump can be operated without damaging components thereof, and as such, a single VFD or set of VFDs may provide horsepower in excess of what is required by a pump to operate the pump at a maximum rate. As such, embodiments usable within the scope of the present disclosure can include multiple high pressure pumps associated with a single VFD. In an embodiment, pumps can be provided with a "breakaway" usable to disconnect a selected pump from a VFD to enable the full power thereof to be provided to one or more pumps that remain connected therewith. In a further embodiment, a VFD can be associated with different types of pumps (e.g., a quintiplex and/or a triplex pump), to enable selective use of one or both types of pumps in a manner that minimizes harmonic resonance.

[0012] An advantage of the present disclosure is the improved safety of engines for explosion risk when compared to traditional diesel engines and transmissions.

[0013] An advantage of the present disclosure is the elimination, and/or reduction, of engine requirements around the high pressure flammable frac fluid.

[0014] An advantage of the present disclosure is the elimination of diesel engines running away.

[0015] An advantage of the present disclosure is the faster response times to upsets.

[0016] An advantage of the present disclosure is the ability to have greater control of pump rate, including micro second kickouts, and the ability to soft start.

[0017] An advantage of the present disclosure is the improved reliability of systems.

[0018] An advantage of the present disclosure includes the improved life span of pumping equipment, and the elimination of engine and line pulsations.

[0019] An advantage of the present disclosure is the reduced maintenance requirements resultant from the elimination of engine and transmission
requirements in some embodiments.

[0020] An advantage of the present disclosure is the improved ability to operate in extreme cold weather.

[0021] An advantage of the present disclosure includes real time diagnostics, which can be utilized for predictive maintenance.

[0022] An advantage of the present disclosure is the reduction in manual labor, with some embodiments configured to be managed from a remote location.

[0023] An advantage of the present disclosure includes reductions and/or elimination of emissions from pump equipment in some embodiments.

[0024] An advantage of the present disclosure includes reductions and/or elimination of noise from pump equipment in some embodiments.

[0025] An advantage of the present disclosure includes reduction in traffic to well site in some embodiments.

[0026] In various embodiments, disclosed systems can be used with medium voltage (e.g., 4160 volts), enabling smaller, lighter power conduits to be used, facilitating transport, installation, and safety, while minimizing line loss and the required amperage to operate the system.

[0027] In various embodiments, VFDs and/or similar components can be positioned a selected distance (e.g., 30 meters) from the high pressure pumps, thereby minimizing risks of ignition when pumping a flammable medium, such as propane and/or other hydrocarbon-based fracturing fluids. Separation of potential ignition sources from flammable components can eliminate the need to utilize explosion-proof measures (e.g., explosion-proof housings, pressurized environments, etc.)
BRIEF DESCRIPTION OF THE DRAWINGS

[0028] In the detailed description of various embodiments usable within the scope of the present disclosure, presented below, reference is made to the accompanying drawings, in which:

[0029] FIGURE 1 depicts a diagrammatic view of an embodiment of a system usable within the scope of the present disclosure.

[0030] FIGURE 2 depicts a diagrammatic view of an embodiment of a system usable within the scope of the present disclosure.

[0031] FIGURE 3 depicts a diagrammatic view of an embodiment of a system usable within the scope of the present disclosure.

[0032] FIGURE 4 depicts a diagrammatic view of a prior art system.

[0033] FIGURE 5 depicts a diagrammatic view of a prior art system.

[0034] One or more embodiments are described below with reference to the listed FIGURES.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0035] Before describing selected embodiments of the present invention in detail, it is to be understood that the present invention is not limited to the particular embodiments described herein. The disclosure and description herein is illustrative and explanatory of one or more presently preferred embodiments of the invention and variations thereof, and it will be appreciated by those skilled in the art that various changes in the design, organization, order of operation, means of operation, equipment structures and location, methodology, and use of mechanical equivalents may be made without departing from the spirit of the invention.

[0036] As well, it should be understood the drawings are intended illustrate and plainly disclose presently preferred embodiments of the invention to one of skill in the art, but are not intended to be manufacturing level drawings or renditions of final products and may include simplified conceptual views as desired for easier and quicker understanding or explanation of the invention.
As well, the relative size and arrangement of the components may differ from that shown and still operate within the spirit of the invention as described throughout the present application.

Moreover, it will be understood that various directions such as "upper", "lower", "bottom", "top", "left", "right", and so forth are made only with respect to explanation in conjunction with the drawings, and that the components may be oriented differently, for instance, during transportation and manufacturing as well as operation. Because many varying and different embodiments may be made within the scope of the inventive concept(s) herein taught, and because many modifications may be made in the embodiments described herein, it is to be understood that the details herein are to be interpreted as illustrative and non-limiting.

FIGURE 1 depicts a diagrammatic view of an embodiment of a system 100 usable within the scope of the present disclosure, usable to perform fracturing operations on a formation associated with a wellhead 102. The diagram may depict a cleared zone 103 (e.g., having a radius of about 30 meters) about the wellhead 102, outside of which the depicted system 100 can be positioned. At the far left of the diagram, a plurality of fracturing fluid storage vessels 104 are shown (e.g., six propane storage tanks; however, any number and/or type of storage vessel can be used without departing from the scope of the present disclosure), in association with a proppant storage vessel 106 (which can be representative of any number or type of proppant sources and/or containers). It should be understood that while the depicted system 100 describes use of propane storage tanks 106 (e.g., containing propane for use as a fracturing fluid), the depicted system 100 can incorporate use of water or any other fracturing fluid without departing from the scope of the present disclosure.

The fracturing fluid and proppant storage vessels 104, 106, may be shown proximate to the low pressure manifold 108 of system 100, where the fracturing fluid and/or proppant can be injected (e.g., as a slurry). A plurality of high pressure pumps 112 (each powered using an associated electric motor) may be shown, the pumps 112 being usable to pressurize the fracturing fluid and/or proppant (e.g., at the high pressure manifold 110 of system 100) prior
to flowing the fracturing fluid and/or proppant to the wellhead 102 (and subsequently into the wellbore to the formation). While the depicted diagram may show eight high-pressure pumps 112 and associated motors 114, it should be understood that any number of high pressure pumps 112 can be used depending on the nature of the operation. Conceptually, FIGURE 1 depicts the eight high pressure pumps 112 divided into three groups - two sets of three pumps 112 and one set of two pumps 112 - each grouping of pumps 112 representative of a single transport load (e.g., the number of pumps 112 that could be transported to an operational site on a single trailer). It should be understood that this division of pumps 112 is merely conceptual, and that depending on the means of transport and/or the characteristics of the pumps 112, motors 114, and/or associated equipment, any number of transport loads could be used without departing from the scope of the present disclosure.

[0040] A plurality of Variable Frequency Drives (VFDs) 116 may be shown spaced a selected distance (e.g., 30 meters) from the high pressure pumps 112. Placement of the VFDs 116 a safe distance from the high pressure pumps 112 can allow propane or a similar flammable medium to be used as a fracturing fluid while minimizing the risk of ignition created by the proximity of VFDs 116 or similar potential ignition sources. By placing the VFDs 116 remote from the high pressure pumps 112, the need for explosion proof housings, pressurized environments, and/or use of similar explosion-proof measures can be eliminated.

[0041] While FIGURE 1 depicts four VFDs 116 (used in association with the eight depicted high pressure pumps 112 and associated electric motors 114), it should be understood that any number of VFDs 116 or similar devices can be used depending on the nature and/or requirements of an operation and/or characteristics of equipment being used. Conceptually, FIGURE 1 depicts the four VFDs 116 as a single grouping of devices, representative of a single transport load - e.g., it is contemplated that four VFDs 116 could be transported to an operational site on a single trailer. As noted above, depending on the means of transport and/or the characteristics of the equipment utilized, any number of transport loads could be used without departing from the scope of the present disclosure. In the depicted embodiment, four transport loads may be used to position each of the depicted
pumps 112, motors 114, and VFDs 116, which is one-half the number of loads required to deploy such a quantity of equipment using conventional configurations.

[0042] Each VFD 116 may be shown in operative association with two high pressure pumps 112 (via the associated electric motors 114). As described above, the maximum rate at which a high pressure pump 112 can be operated is typically limited to the maximum torque able to be withstood by the components thereof. As such, a single VFD 116 may produce horsepower in excess of that which is required to operate a high pressure pump 112 at its maximum rate, and in an embodiment, the horsepower output of a VFD 116 can be generally sufficient to operate two high pressure pumps 112 at a rate suitable for performing a fracturing operation. For example, four conventional VFDs 116 may output approximately 10,000 horsepower, which may be sufficient to operate eight high pressure pumps 112 at approximately their maximum rate. It should be understood that the type and quantity of VFDs 116 and/or pumps 112 and/or electric motors 114 can be selected such that the output of the VFDs 116 is generally equal to the horsepower requirements to operate the associated pumps 112.

[0043] As described above, in various embodiments, one or both pumps 112 coupled with a VFD 116 can include a breakaway or similar means for decoupling from the VFD 116, such that the entirety of the output from the VFD 116 can be used to drive a single pump 112 (e.g., at an enhanced rate), and/or to enable a second pump 112 to be used as a backup/redundant pump in the case of a fault or failure of a first pump. Additionally or alternatively, two pumps 112 associated with a single VFD 116 can include different types of pumps, such that a desired type of pump 112 can be selected for use (e.g., depending on operational conditions, wellbore conditions, types of equipment present/available, etc.). For example, selection between a quintiplex and/or a triplex pump can be used to minimize harmonic resonance.

[0044] The depicted VFDs 116 are shown in communication with a power source, which can include one or more generators, one or more power storage devices, one or more grid power sources, or combinations thereof. In an embodiment, the incoming power 118 can include a medium voltage source
(e.g., 4160 volts), allowing use of smaller and lighter conduits, less line loss, lower amperage, etc. Depending on the characteristics of the VFDs 116, power source 118, motors 114, and/or pumps 112 used, the need for a separate transformer (e.g., to alter the incoming voltage and/or the voltage transmitted between components) can be obviated.

[0045] It should be understood that while FIGURE 1 depicts eight high pressure pumps 112 and associated electric motors 114, and four VFDs, independent from trailers or similar transport vehicles (e.g., frame-mounted on the ground or an operational platform or similar surface), in various embodiments, system 100 components may remain in association with trailers or similar transport vehicles to facilitate mobility thereof.

[0046] FIGURE 2 depicts a diagrammatic view of an embodiment of a system 200 usable within the scope of the present disclosure, usable to perform fracturing operations on a formation associated with a wellhead 202. The diagram depicts a cleared zone 204 (e.g., having a radius of about 30 meters) about the wellhead 202, outside of which the depicted system 200 can be positioned. At the bottom of the diagram, a plurality of fracturing fluid storage vessels 206 may be shown (e.g., six water storage tanks; however any number and/or type of storage vessel can be used without departing from the scope of the present disclosure), in association with a proppant storage vessel 208 (which can be representative of any number or type of proppant sources and/or containers). It should be understood that while the depicted system describes use of water storage tanks (e.g., containing water for use as a fracturing fluid), the depicted system can incorporate use of any fracturing fluid without departing from the scope of the present disclosure. Due to the close proximity of the depicted VFDs 210 to the depicted high pressure pumps 212, the depicted configuration is contemplated to be of particular use with non-flammable fracturing fluids.

[0047] The fracturing fluid and proppant storage vessels 206,208 are shown proximate to the low pressure manifold 214 of the system 200, where the fracturing fluid and/or proppant can be injected (e.g., as a slurry). A plurality of high pressure pumps 212 may each be powered using an associated electric motor 216 and may each be mounted on an associated trailer 218 (as shown).
The pumps 212 may be usable to pressurize the fracturing fluid and/or proppant (e.g., at the high pressure manifold of system 200) prior to flowing the fracturing fluid and/or proppant to the wellhead 202 (and subsequently into the wellbore to the formation). While the depicted diagram shows eight high pressure pumps 212 and associated motors 216, it may be understood that any number of high pressure pumps 212 can be used depending on the nature of the operation.

[0048] A plurality of Variable Frequency Drives (VFDs) 210 may be shown in association with the depicted high pressure pumps 212. Specifically, each trailer 218 may be shown having one VFD 210 mounted thereon, adjacent to two high pressure pumps 212 and associated motors 216. While FIGURE 2 depicts four VFDs 210 (each used in association with two high pressure pumps 212 and associated electric motors 216), mounted on four trailers 218, it should be understood that any number of VFDs 210 or similar devices, and any number of trailers 218, can be used depending on the nature and/or requirements of an operation and/or characteristics of equipment being used. In the depicted embodiment, four transport loads 218 may be used to position each of the depicted pumps 212, motors 216, and VFDs 210, which is one half the number of loads required to deploy such a quantity of equipment using conventional configurations.

[0049] Due to the horsepower limitations of a typical high pressure pump 212, described previously, each VFD 210 is shown in operative association with two high pressure pumps 212. As described above, in various embodiments, one or both pumps 212 coupled with a VFD 210 can include a breakaway or similar means for decoupling from the VFD 210, such that the entirety of the output from the VFD 210 can be used to drive a single pump 212 (e.g., at an enhanced rate), and/or to enable a second pump 212 to be used as a backup/redundant pump 212 in the case of a fault or failure of a first pump 212. Additionally, or alternatively, two pumps 212 associated with a single VFD 210 can include different types of pumps 212, such that a desired type of pump 212 can be selected for use (e.g., depending on operational conditions, wellbore conditions, types of equipment present/available, etc.).

[0050] The depicted VFDs 210 are shown in communication with one or
more power sources 220, which can include one or more generators, one or more power storage devices, one or more grid power sources, or combinations thereof. In an embodiment, the incoming power can include a medium voltage source (e.g., 4160 volts), allowing use of smaller and lighter conduits, less line loss, lower amperage, etc. Depending on the characteristics of the VFDs 210, power sources 220, motors 216, and/or pumps 212 used, the need for a separate transformer (e.g., to alter the incoming voltage and/or the voltage transmitted between components) can be obviated.

[0051] It should be understood that while FIGURE 2 depicts four mobile trailers, each trailer having two high pressure pumps and a single VFD mounted thereon, in various embodiments, system components may be removed from trailers (e.g., frame mounted on the ground or a similar operational platform) to reduce the footprint of the system 100 and allow use of the trailers for other purposes while system 200 is deployed.

[0052] In the depicted embodiment, use of two high pressure pumps 212 and a single VFD on a single trailer can enable the two pumps 212 to be operated via the VFD using a single tie line. Using a reduced number of lines for system 200 in this manner may enable the manifold trailer to be reduced in size (e.g., one half of its conventional length), reducing the footprint of system 200 and facilitating transport thereof.

[0053] FIGURE 3 depicts a diagrammatic view of an embodiment of a system 300 usable within the scope of the present disclosure, wherein the exemplary system is usable for performing fracturing operations on a formation associated with a wellhead. As shown, the exemplary system 300 comprises at least a first high pressure pump 302, a first motor 304, a first VFD 306, and an electrical supply 308. As shown, in the exemplary system depicted, an energy supply is configured to provide medium level voltage, which is directly connected to the VFD 306. The VFD 306, without altering the input voltage, outputs a medium level voltage, which may be directly received by the first motor 304, where it may be converted to mechanical power for driving the first high pressure pump 302. For exemplary purposes, FIGURE 3 further depicts a second VFD 307, which may be connected to a respective second motor 305 and second high pressure pump 303. Those
knowledgeable in the art will understand that a greater or less number of combinations may be utilized without departing from the scope of the present disclosure. FIGURE 3 further depicts exemplary power sources, including: generator 310, main line power supply 312, and generator with transformer 314, which may be utilized for the purposes of providing medium voltage power to system 300.

[0054] FIGURE 4 depicts a diagrammatic view of prior art system 400, as may be commonly used in the art. As shown, prior art system 400 may include a high pressure pump 402, motor 404, VFD 406, series connected transformer 408, and power supply 410. As shown, it is a requirement of known prior art systems that transformer 408 be connected in series with VFD 406, for converting power supply 410 to usable level. For example, a system may be supplied with medium voltage, e.g. 4160 volts, power via power source 410, wherein power supply is connected transformer 408, which converts power from medium voltage to low voltage, e.g. 600 volts, wherein power is then supplied to VFD 406, and subsequently motor 404, which supplies mechanical power to high pressure pump 402. As shown, the prior art arrangement therefore contrasts with the embodiment depicted in FIGURE 3, which does not require stepping down, or stepping up, of medium format voltage by an in series, or connected VFD transformer, in order to supply VFD with operational power.

[0055] FIGURE 5 depicts a diagrammatic view of further prior art system 500, as may be commonly used in the art. As shown, prior art system 500 may include a high pressure pump 502, a motor 504, a VFD with integrated transformer 506, and a power supply 508. As shown, it is a requirement of this known prior art system that transformers be integrated with VFD, to convert incoming power supply 510 to a usable level.

[0056] FIGURE 6 depicts a diagrammatic view of an embodiment of a system 600 usable within the scope of the present disclosure, wherein the exemplary system is usable for performing fracturing operations on a formation associated with a wellhead. As shown, in some embodiments, system 600 may be configured to pressurize fluid 1 to a first pressure, and fluid 2 to a second pressure.
FIGURE 7 depicts a diagrammatic view of an embodiment of a system 100 usable within the scope of the present disclosure, usable to perform fracturing operations on a formation associated with a wellhead 102. As shown, the present disclosure may allow for the location of high pressure pump 110 and motor 112 within a "hot zone" 150 with a VFD 116 to be located outside the hot zone. One of ordinary skill will understand that such a "hot zone" may be a safety zone identified in relation to a flammability or explosion safety standard, which may relate to use of a flammable fracturing fluid. In some embodiments, a pump 110 and motor 112 may be housed in a flammability or explosion control enclosure such as, for example, an ATEX certified enclosure or compliant with other hazard reduction standards.

It should be noted that the ATEX Directive requires equipment and protective systems intended for explosive atmospheres to be designed and manufactured to minimize the occurrence and limit the severity of accidental explosions.

In some embodiments, a medium voltage may be provided to system componentry. In some embodiments, medium voltage provided to system componentry may be in the range of 600 volts to 35,000 volts. In some embodiments, medium voltage provided to system componentry may be in the range of 3500 volts to 7500 volts. In some embodiments, medium voltage provided to system componentry may be 4160 volts.

The process of determining the type and size of these hazardous areas is called area classification. Guidance on assessing the extent of the hazard is given in the NFPA 497 or NFPA 499 standards published by the National Fire Protection Association for explosive gas or dust atmospheres respectively, or RP 500 and RP 505 standards published by the American Petroleum Institute for explosive gas or dust atmospheres respectively, and IEC 60079-10-1 or IEC 60079-10-2 standards published by the International Electrotechnical Commission for explosive gas or dust atmospheres respectively.

While various embodiments usable within the scope of the present disclosure have been described with emphasis, it should be understood that within the scope of the appended claims, the present invention can be practiced other than as specifically described herein.
CLAIMS

What is claimed is:

1. A system for stimulating a formation, the system comprising:
   a source of fracturing fluid in communication with the formation;
   a source of proppant in communication with the formation;
   a medium voltage power source;
   a variable frequency drive in communication with the medium voltage power source;
   an electric motor in communication with said variable frequency drive; and
   a high pressure pump in communication with said electric motor,
   wherein the variable frequency drive receives medium voltage power from the medium voltage power source and actuates, using medium voltage, said electric motor, and wherein said electric motor actuates said high pressure pump, and wherein said high pressure pump pressurizes fracturing fluid, proppant, or combinations thereof for flowing said fracturing fluid, proppant, or combinations thereof into the formation.

2. The system of claim 1, further comprising at least one additional high pressure pump, wherein said at least one additional high pressure pump is actuated by said electric motor.

3. The system of claim 1 further comprising at least one additional high pressure pump and at least one additional electric motor, wherein said at least one additional high pressure pump is powered by said at least one additional electric motor, and wherein said at least one additional electric motor receives medium voltage from said variable frequency drive.

4. The system of claim 1, wherein the medium power source is a range of 3500 volts to 7500 volts.
5. The system of claim 1, wherein said variable frequency drive is configured for transport on a trailer.
6. The system of claim 1, wherein said variable frequency drive, said electric motor, and said high pressure pump are transportable on a single trailer.
7. The system of claim 1, wherein said variable frequency drive is located outside a hot zone.
8. The system of Claim 1, wherein said high pressure pump and said electric motor are located are within a hot zone.
9. The system of claim 1, wherein said variable frequency drive is spaced a distance from said high pressure pump and said motor sufficient to minimize ignition of:
   fracturing fluid pressurized by said high pressure pump.
10. The system of claim 1, wherein the source of fracturing fluid comprises propane.
11. The system of claim 1, further comprising a wellhead in association with the formation, wherein said high pressure pump is spaced a distance from the wellhead sufficient to minimize ignition of fracturing fluid pressurized by said high pressure pump.
12. The system of Claim 1, wherein said high pressure pump is configured to pressurize a first fluid.
13. The system of Claim 11, further comprising a second high pressure pump, wherein said second high pressure pump is configured to pressurize a second fluid.
14. The system of Claim 11, wherein said high pressure pump and said second high pressure pump independently pressurize said first fluid and said second fluid.
15. A system for stimulating a formation, the system comprising:
   a source of fracturing fluid in communication with the formation;
   a source of proppant in communication with the formation;
   at least one power source;
   at least one mobile platform comprising a variable frequency drive and a pressure pump mounted thereon, wherein said high
pressure pump are coupled to the variable frequency drive, wherein the variable frequency drive receives power from said at least one power source and actuates an electric motor associated with said pressure pump, and wherein said high pressure pump pressurize fracturing fluid, proppant, or combinations thereof for flowing said fracturing fluid, proppant, or combinations thereof into the formation.

16. The system of claim 15, wherein the medium power source comprises a medium voltage power source ranging from 3500 volts to 7500 volts.

17. The system of claim 15, wherein said at least one mobile platform comprises at least a second mobile platform, each of said mobile platform and said at least a second mobile platform having a variable frequency drive and a high pressure pump mounted thereon.

18. The system of claim 15, wherein said high pressure pumps engage the variable frequency drive via a single tie line.

19. The system of claim 15, further comprising a wellhead in association with the formation, wherein said high pressure pump are spaced a distance from the wellhead sufficient to minimize ignition of fracturing fluid pressurized by said high pressure pump.

20. The system of claim 15, wherein said high pressure pump comprises a breakaway feature adapted to decouple said high pressure pump from the variable frequency drive to enable substantially all output from the variable frequency drive to be provided to at least one other of said high pressure pumps.

21. The system of claim 15, further comprising a second high pressure pump, wherein said second high pressure pump having a type different than a type of said high pressure pump.

22. The system of claim 21, wherein the first type comprises a quintplex pump and the second type comprises a triplex pump.

23. The system of claim 21, wherein the first type, the second type, or combinations thereof is selectable to reduce harmonic resonance, vibration, or combinations thereof generated by said at least two high pressure pumps, the variable frequency drive, or combinations thereof.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

INV. E21B43/26 E21B43/267

**ADD.**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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**X** Further documents are listed in the continuation of Box C.

**X** See patent family annex.

* Special categories of cited documents:

**A** document defining the general state of the art which is not considered to be of particular relevance

**E** earlier application or patent but published on or after the international filing date

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Date of the actual completion of the international search: 1 September 2016

Date of mailing of the international search report: 09/09/2016

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Authorized officer: Dantinne, Patrick
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<th>Category</th>
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