

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

NATIONAL OILWELL VARCO, L.P.,

Plaintiff,

v.

OMRON OILFIELD & MARINE, INC.,

Defendant.

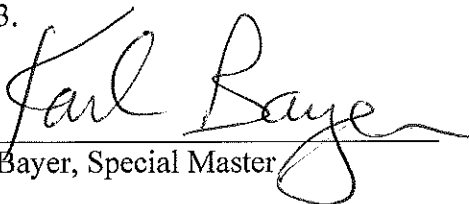
Civil Action No. A-12-CA-773-SS

REPORT AND RECOMMENDATIONS OF THE SPECIAL MASTER REGARDING
UNITED STATES PATENT NO. 5,474,142.

Attached hereto is the Special Master's Report and Recommendations to United States District Judge Sam Sparks regarding the construction of claims in United States Patent No. 5,474,142.

The parties may file written objections to the recommendations made in this report within ten (10) days from the date of their receipt of it, as discussed at the conclusion of the *Markman* hearing.

SIGNED this the 1st day of August, 2013.


Karl Bayer, Special Master

CERTIFICATE OF SERVICE

I hereby certify that on the ____ day of August, 2013, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to counsel of record in this action.

/s/ Karl Bayer
Karl Bayer

**SPECIAL MASTER'S RECOMMENDATIONS FOR PERSON OF ORDINARY
SKILL IN THE ART REGARDING PATENT NO. 5,474,142**

A Person of Ordinary Skill in the Art is someone with at least five years experience in the oil and gas industry including oil drilling operations and developing drilling systems. Additionally they should have an undergraduate collegiate degree in mechanical or electrical engineering, or at least five years working in an engineering field.

SPECIAL MASTER'S RECOMMENDED CONSTRUCTIONS
PATENT NO. 5,474,142

Term/Phrase (claims)	Special Master's Recommendations
"drilling fluid" (Claims 1, 11, 14) <u>Claim 1:</u> "a drilling fluid pressure sensor; a drilling fluid pressure regulator coupled to said drilling fluid pressure sensor, said drilling fluid pressure regulator measuring changes in drilling fluid pressure and outputting a signal representing those changes ... wherein a decrease in drilling fluid pressure results in ... and an increase in drilling fluid pressure results in ..." <u>Claim 11:</u> "measuring drilling fluid pressure; producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure ... controlling said drill string controller to increase the rate of release of said drill string ... when said signal represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string ... when said signal represents an increase in drilling fluid pressure." <u>Claim 14:</u> "measuring drilling fluid pressure ... producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure ..."	Mud pumped down the drill string.
"bit weight" <u>Claim 14:</u> "measuring drilling fluid pressure and bit weight ... producing a second signal in response to changes in bit weight said second signal representing the changes in bit weight ..."	An approximation of downward force placed on the bit by the weight of the drill string.
"changes in drilling fluid pressure" "changes in bit weight" <u>Claim 1:</u> "a drilling fluid pressure regulator coupled to said drilling fluid pressure sensor, said drilling fluid pressure regulator measuring changes in drilling fluid pressure and outputting a signal representing those changes ..." <u>Claim 11:</u> "producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in	No construction necessary.

<u>drilling fluid pressure</u> Claim 14: “producing a first signal in response to <u>changes in drilling fluid pressure</u>, said first signal producing a second signal in response to <u>changes in bit weight</u>; producing a second signal in response to <u>changes in bit weight</u>, said second signal representing <u>changes in bit weight</u>; selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string ...”	
<u>“drilling fluid pressure regulator”</u> Claim 1: “a <u>drilling fluid pressure regulator</u> coupled to said drilling fluid pressure sensor, said <u>drilling fluid pressure regulator</u> measuring changes in drilling fluid pressure and outputting a signal representing those changes; a relay coupled to said <u>drilling fluid pressure regulator</u>, said relay responsive to the output signal of said <u>drilling fluid pressure regulator</u> to supply a drill string control signal at an output thereof”	No construction necessary.
<u>“selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string”</u> Claim 14: “A method for automatically regulating the release of the drill string of a drilling rig drill, comprising the steps of: measuring drilling fluid pressure and bit weight; producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight; <u>selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string</u>; and relaying said selected signal or signals to a drill string controller which regulates the release said drill string in response to said selected signal or signals.”	No construction necessary.
<u>“drill string controller”</u> Claim 1: “a <u>drill string controller</u> coupled to said relay wherein ... relay supplying a drill string control signal that operates said <u>drill string controller</u> to effect an increase in the rate of release ... relay supplying a drill string control signal that operates said <u>drill string controller</u> to effect a decrease in the rate of release ...”	A device that changes the rate of release of the drill string in response to signals from the relay(s).

<u>Claim 11:</u> “relaying said signal to a drill string controller; and controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents ...” <u>Claim 14:</u> “relaying said selected signal or signals to a drill string controller which regulates the said drill string in response to said selected signal or signals.”	
“relay coupled to said drilling fluid pressure regulator” <u>Claim 1:</u> “a drilling fluid pressure regulator ... outputting a signal representing those changes ... a relay coupled to said drilling fluid pressure regulator, said relay responsive to the output signal of said drilling fluid pressure regulator to supply a drill string control signal at an output thereof ...”	A device that generates a drill string control signal in response to a signal from the drilling fluid pressure regulator.
“signal representing those changes” “said signal representing the changes in drilling” “said first signal representing the changes in drilling fluid pressure” “said second signal representing the changes in bit weight” <u>Claim 1:</u> “a drilling fluid pressure regulator coupled to said drilling fluid pressure sensor, said drilling fluid pressure regulator measuring changes in drilling fluid pressure and outputting a signal representing those changes” <u>Claim 11:</u> “producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure; relaying said signal to a drill string controller, and controlling said drill string controller...” <u>Claim 14:</u> “producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said	A signal that indicates the changes in only drilling fluid pressure. A signal that indicates the changes in only bit weight.

<u>second signal representing the changes in bit weight</u> ... selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and relaying said selected signal or signals to a drill string controller ...”	
“relying [sic] said signal to a drill string controller” “Relaying said selected signal or signals to a drill string controller” <u>Claim 11:</u> “producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure; <u>relaying said signal to a drill string controller</u>, and controlling said drill string controller...” <u>Claim 14:</u> “producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight... selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and <u>relaying said selected signal or signals to a drill string controller</u> which regulates the release said drill string in response to said selected signal or signals.”	No construction necessary.
“regulates the release said drill string in response to said selected signal or signals” <u>Claim 14:</u> “producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight; selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and relaying said selected signal or signals to a drill string controller which <u>regulates the release said drill string in response to said selected signal or signals.</u>”	No construction necessary.
“a decrease in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect an increase in the rate of release of said string ... an increase in drilling fluid pressure results in said relay supplying a drill string control signal that	No construction necessary.

operates said drill string controller to effect a decrease in the rate of release of said drill string.”

Claim 1:

“An automatic drilling system for automatically regulating the release of the drill string of a drilling rig during the drilling of a borehole, comprising...
A drill string controller coupled to said relay wherein a decrease in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect an increase in the rate of release of said string with direct effect at the drill bit associated with the drill string and an increase in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect a decrease in the rate of release of said drill string with direct effect at the drill bit associated with the drill string.”

“controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents a decrease in drilling fluid pressure ... to decrease the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents an increase in drilling fluid pressure”

Claim 11:

“A method for automatically regulating the release of the drill string of a drilling rig drill, comprising the steps of...and, **controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents an increase in drilling fluid pressure.”**

No construction necessary.

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
"drilling fluid" (Claims 1, 11, 14) Claim 1: "a <u>drilling fluid</u> pressure sensor; a <u>drilling fluid</u> pressure regulator coupled to said <u>drilling fluid</u> pressure sensor; said <u>drilling fluid</u> pressure regulator measuring changes in <u>drilling fluid</u> pressure and outputting a signal representing those changes ... wherein a decrease in <u>drilling fluid</u> pressure results in ... and an increase in <u>drilling fluid</u> pressure results in ..." Claim 11: "measuring <u>drilling fluid</u> pressure; producing a signal in response to changes in <u>drilling fluid</u> pressure; said signal representing the changes in <u>drilling fluid</u> pressure ... controlling said drill string controller to increase the rate of release of said drill string ... when said signal represents a decrease in <u>drilling fluid</u> pressure and to decrease the rate of release of said drill string ... when said signal represents an increase in <u>drilling fluid</u> pressure." Claim 14: "measuring <u>drilling fluid</u> pressure ... producing a first signal in response to changes in <u>drilling fluid</u> pressure; said first signal representing the	Needs no construction. Alternative Construction: "drilling mud"	1. "Drilling fluid" is repeatedly used in the '142 Patent without further definition. Doc.No. 25, Ex. 1 ('142 Pat.), Col. 1, 1. 58 – Col. 3, 1. 2 (Summary of the Invention). 2. This term's plain and ordinary meaning is apparent to a juror and would be easily recognized by a POOSITA (the proper standard to apply). <i>Phillips v. AWH Corp.</i>, 415 F.3d 1313, 1316 (Fed. Cir. 2005)(hereinafter "<i>Phillips</i>"). 3. Evidence that "drilling fluid" is known to a POOSITA can be found in dictionaries that use this term the substantially the same way for well over a decade (1991 – 2005). Doc.No. 26, Exs. O & P. 4. If this term is given any construction, the patentee expressly defined "drilling fluid" to mean "mud." Doc.No.25, Ex. 1 ('142 Pat.), Col. 3, 1. 67 – Col. 4, 1. 10. A patentee's lexicography always governs over an argued claim construction. <i>Phillips</i>. 5. Omron's preliminary	"fluid, such as air, gas, water, or mud, that is pumped down the drill string"	Ex. K, A Dictionary for the Petroleum Industry (1991) at 82 (definition of "drilling fluid"). Ex. V, Dictionary of Petroleum Exploration, Drilling & Production (1991) at 151 (definition of "drilling fluid"). Ex. W, A Dictionary of Petroleum Terms (1983) at 46 (definition of "drilling fluid"). Ex. Q, NOV's Markman Brief in the Colorado case at 27. Ex. U, NOV's Markman Brief in the Eastern District of Texas case at 15.	Mud pumped down the drill string.

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
changes in <u>drilling fluid</u> pressure ...		noninfringement contentions do not further define "drilling fluid." Doc. No. 25, Ex. 30.			

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

Claim Terms	NOV's Proposed Construction	NOV Supporting Evidence	Omron's Proposed Construction	Omron Supporting Evidence	Special Master Bayer's Construction
"bit weight" Claim 14: "measuring drilling fluid pressure and <u>bit weight</u> ... producing a second signal in response to changes in <u>bit weight</u> said second signal representing the changes in <u>bit weight</u> ..."	Needs no construction. Alternative Construction: "the amount of weight or force that the drill string applies to the drill bit sensed from the drilling rig"	"Bit weight" is used throughout the '142 Patent without further definition. Doc.No. 25, Ex. 1, Col. 6, ll. 12 – 33. - Evidence that "bit weight" is well known to a POOSITA can be found in dictionaries that have defined this term in substantially the same way for over a decade (1991- 2005). Doc.No. 26, Exs. K & Q. - If this term is given any construction, the specification describes "bit weight" as the "weight drill string 21 applies to" or "on top of" "drill bit 23." <i>Id.</i> at Col. 6, ll. 15 – 17; ll. 26 – 29. A patentee's lexicography always governs over an argued claim construction. <i>Phillips</i>.	"an approximation of the amount of weight or force applied to the drill bit"	'142 patent 6:12-36. Ex. K, A Dictionary for the Petroleum Industry (1991) at 304 (definition of "weight on bit"). Ex. Q, NOV's Markman Brief in the Colorado case at 65.	An approximation of downward force placed on the bit by the weight of the drill string.
"changes in drilling fluid pressure" "changes in bit weight" Claim 1: "a drilling fluid pressure regulator coupled to said drilling fluid pressure sensor, said drilling fluid pressure regulator measuring <u>changes in drilling fluid pressure</u> and outputting a signal representing those <u>changes</u> ..."	Needs no construction. Alternative Construction: "changes in drilling fluid pressure [or bit weight] from a set reference point"	- The Federal Circuit reversed a construction by the District of Colorado and held that "manual calibration" was a pre-patent claim step that could not be inserted into Claim 14. Doc.No.25, Ex. 3, <i>Varco. L.P.</i> 436 F.3d at 1371. - The Federal Circuit's refusal to insert manual calibration was based on the preamble of Claim 14.	"an increase or decrease in drilling fluid pressure compared to a reference point set by manual calibration before drilling" "an increase or decrease in bit weight compared to a reference point set by manual calibration before drilling"	'142 patent 1:57-2:3 describing the "present invention" as having regulators). '142 patent 8:57-61, 12:7-10, 14:58-62, 18:9-13 (regulators "must" be calibrated). '142 patent 8:62-10:3, 12:11-18, 14:63-16:4, 18:14-19:18 (describing the calibration).	No construction necessary.

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
Claim 11: “producing a signal in response to <u>changes in drilling fluid pressure</u>, said signal representing the <u>changes in drilling fluid pressure</u>” Claim 14: “producing a first signal in response to <u>changes in drilling fluid pressure</u>, said first signal producing a second signal in response to <u>changes in bit weight</u>; producing a second signal in response to <u>changes in bit weight</u>, said second signal representing <u>changes in bit weight</u>; selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string ...”		which precedes the “changes in” steps. <i>Id.</i> at 1373 (“Hence, the language of Claim 14 (<i>particularly the preamble</i>) does not support the district court’s construction of this step.”)(emphasis added). 3. The preamble of Claim 11 is identical to 14 and the preamble of Claim 1 is almost identical. The same logic applies to these claims. 4. The Eastern District refused to insert “manual calibration” into any of the claims. Doc.No. 25, Ex. 3, at p. 27. 5. If this Court feels the terms need construction, NOV agrees with this Court’s suggested construction of “changes from a set reference point.” Doc.No. 39, Ex. 29 (<i>Markman</i> Transcript (76:11 – 16) & (81:7 – 11)).			
“drilling fluid pressure regulator” Claim 1: “a <u>drilling fluid pressure regulator</u> coupled to said drilling fluid pressure sensor, said <u>drilling fluid pressure</u> regulator measuring changes in drilling fluid pressure and	Needs no construction.	1. The Federal Circuit already ruled that the “drilling fluid pressure regulator” is not limited to manual calibration: “This language suggests that the selecting step is not limited to manual operation of valve selectors and/or manual	“a device that compares only the measured drilling fluid pressure to a reference point set by manual calibration before drilling”	<u>With regard to manual calibration:</u> ‘142 patent 1:57-2:3 (“Summary of the invention” describing the “present invention” as having regulators). ‘142 patent 8:57-61, 12:7-10,	No construction necessary.

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
outputting a signal representing those changes: a relay coupled to said <u>drilling fluid pressure regulator</u> , said relay responsive to the output signal of said <u>drilling fluid pressure regulator</u> to supply a drill string control signal at an output thereof"		calibration of regulators as construed by the district court." 2. Doc.No. 25, Ex. 3. <i>Varco, L.P.</i>, 436 F.3d at 1373. 3. The Federal Circuit held the same argument relied upon by Omron - that "must" from the specification required drilling fluid pressure regulator 200 to be manually calibrated - was an impermissible claim construction. <i>Id.</i> 4. Dependent Claim 5 discloses a specific type of "drilling fluid pressure regulator" expressing a clear intent from the patentee not to further define this term. Doc.No. 25, Ex. 1 ('143 Patent), Col. 25, ll. 53 - 64.		14:58-62, 18:9-13 (regulators "must" be calibrated). '142 patent 8:62-10:3, 12:11-18, 14:63-16:4, 18:14-19:18 (describing the calibration). With regard to "only": '142 patent, claims (plain language, especially claim 14).	
"selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string" Claim 14: "A method for automatically regulating the release of the drill string of a drilling rig drill, comprising the steps of: measuring drilling fluid pressure and bit weight; producing a first signal in	Needs no construction.	1. The Federal Circuit already ruled this exact step does not require manual calibration: 2. "This language suggests that the selecting step is not limited to manual operation of valve selectors and/or manual calibration of regulators as construed by the district court." 3. "In addition, the specification does not	"automatically choosing which signal (either the signal representing changes in only drilling fluid pressure or the signal representing changes in only bit weight) or both will control the release of the drill string at any given moment based on the manual calibrations performed before drilling"	'142 patent 1:57-2:3 ("Summary of the Invention" describing the "present invention" as having regulators). '142 patent 8:57-61, 12:7-10, 14:58-62, 18:9-13 (regulators "must" be calibrated). '142 patent 8:62-10:3, 12:11-18, 14:63-16:4, 18:14-19:18 (describing the calibration).	No construction necessary.

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight; <u>selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string;</u> and relaying said selected signal or signals to a drill string controller which regulates the release said drill string in response to said selected signal or signals."		limit the selecting step to the manual calibration of regulators ... To the contrary, this portion of the specification sets forth an initial setup or calibration step that precedes the claimed selecting step." 4. "In effect, the district court erred by reading the initial setup or calibration step into the claimed selecting step." 5. "Thus, the prosecution history confirms that selecting in Claim 14 does not encompass the initial setup or calibration of the drilling system." 6. Doc.No.25, Ex. 3, <i>Varco, L.P.</i> , 436 F.3d at 1371 – 74.			
"drill string controller" <u>Claim 1:</u> "a drill string controller coupled to said relay wherein ... relay supplying a drill string control signal that operates said drill string controller to effect an increase in the rate of release ... relay supplying a drill string control signal that operates said drill string controller to effect a decrease in the rate of release ..." <u>Claim 11:</u>	Needs no construction. Alternative construction: "A control system (device) that controls, operates, or regulates the release of the drill string (function)." Alternative Construction if the Court determines 35 U.S.C. 112, 6 governs: Device: "A Control Apparatus" or "Drilling	1. "Drill string controller" is described in detail in the claims including its location and connection with other components of the invention, and its operation of receiving a drill string control signal(s), and operating to regulate an increase or decrease in the rate of release of the drill string based on these signal(s) is described in detail in the claims. Doc.No. 25, Ex. 1, '142 Patent, Col. 24, II. 38 – 58; Col. 27, II. 44 –	Governed by 35 U.S.C. § 112, ¶ 6 (Means-Plus-Function): Function: To control the release of the drill string. Corresponding Structure: Indefinite. In the alternative: At least an air motor or all of the following components: the air motor 204, the differential gear unit 205, the drum rotation sensor 90, the flexible shaft cable 91, the cable reel 206, the brake handle 208, the	'142 patent, "Summary of the Invention" (no structure for "drill string controller"). '142 patent, claims (no structure for "drill string controller"). '142 patent, "Brief Description of the Drawings" and "Detailed Description of the Preferred Embodiments" (no mention of "drill string controller"). Exs. J-M (prior art oilfield dictionaries lacking the term	A device that changes the rate of release of the drill string in response to signals from the relay(s).

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
"relaying said signal to a <u>drill string controller</u>; and controlling said <u>drill string controller</u> to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents ..." <u>Claim 14:</u> "relaying said selected signal or signals to a <u>drill string controller</u> which regulates the said drill string in response to said selected signal or signals."	Control" Function: To control, operate, or regulate the release of the drill string	56; Col. 28, ll. 24 – 39. 2. "Controller" is the proper term to analyze if it had a readily understood meaning in the art not "drill string controller." <i>Personalized Media Communications, LLC v. Int'l Trade Com'n</i>, 161 F.3d 1359, 1367 (Fed. Cir. 2002). "Drill string" is called an "adjectival qualification" and this language adds further definition and structure to "controller." <i>Id.</i> "Drill string" should not be viewed as limiting language to "Controller." <i>Id.</i> 3. "Controllers" used to control the drill string as well as other "control systems;" "control apparatuses;" and "control devices" - all used to control the drill string - are described at length in the prosecution history through the cited prior art. <i>See</i> Doc.No. 44, at p. 5 (citing Doc.No. 25, Ex. 11 (Ball), Col. 5, ll. 5 – 16 and Col. 6, ll. 28 – 45; Ex. 13 (Jasinski) Abstract Ex. 7 (Rogers), Col. 2, ll. 55 – 60 and Col. 3, ll. 8 – 19; Ex. 8 (Adler), at Col. 1, ll. 59 – 66; Ex. 10 (Tanaka), Col. 4, ll. 35 – 43. These prior art patents are part of the intrinsic evidence and	brake 32, the drum 26, and the cable 207.	"drill string controller"). Ex. N (search of USPTO database reveals no use of the term "drill string controller" in prior art patents). Ex. K, A Dictionary for the Petroleum Industry (1991) at 58 (definition of "controller" as an "electric device" contradicts '142 patent). Ex. C, Office Action Response at 2-3 (indicating the <i>parameters</i> are what "regulate the release of the drill string"); Ex. E, Office Action Response at 6 (indicating the <i>regulators</i> are what "control the release of the drill string"); '142 patent 1:4-10 (indicating the entire <i>system</i> "controls the release of the drill string"). <u>Support for alternative construction:</u> '142 patent 10:23-32 & Fig. 2 (components that receive signal and adjust the brake).	

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<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
		show that a POOSITA would have known the meaning of "drill string controller." <i>Phillips</i>. 4. A patent examiner is presumed to be a POOSITA. Three examiners (original prosecution and two reexaminations) have examined the '142 Patent and never questioned the meaning of "drill string controller." Doc.No. 25, Exhibit 2. 5. Two prior infringers (Pason and Auto-Drill) have never questioned whether "drill string controller" conveyed sufficient structure. Doc.No. 25, Exs. 3 & 4. 6. This is likely because "drill string controller" is defined at length in the specification. "The drill string controller attaches to relays to receive a drill string control signal from the regulator or regulators controlling the drilling operation." <i>Id.</i> at Col. 2, ll. 15 – 35; ll. 36 – 59. 7. An example of the preferred embodiment "drill string controller" is shown in Figure 2 of the '142 Patent, and the inner components of the preferred embodiment			

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<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
		drill string controller are described in the specification. <i>Id.</i> at Figure 2 and Col. 7, ll. 23 – 30. 8. NOV presented dictionary definitions that defined “controller” as a readily understood term to a POOSITA (an engineer with experience with automatic control systems). Doc.No. 25, Exs. 24, 25, and 26. 9. Omron’s <i>own</i> dictionary from the relevant time period defines “drilling control” as a “device that is connected to the drawworks brake handle on a drilling rig and maintains a pre-determined weight on the bit ...” Doc.No. 26, Ex. W.			
“relay coupled to said drilling fluid pressure regulator” Claim 1: “a drilling fluid pressure regulator ... outputting a signal representing those changes ... a relay coupled to said drilling fluid pressure regulator, said relay responsive to the output signal of said drilling fluid pressure regulator to supply a drill string control signal at an output thereof ...”	Needs no construction.	1. The preamble to Claim 1 claims an apparatus “comprising” certain elements. This “transition” term does not limit an invention from containing additional elements. Doc.No. 25, Ex. 1 (“142 Patent”), Col. 24 (Claim 1) <i>Gillete Co. v. Energizer Holdings, Inc.</i>, 405 F.3d 1367, 1376 (Fed. Cir. 2005). 2. Claim one states the signal “representing” changes	“a device that generates a drill string control signal in response to changes in only drilling fluid pressure”	“142 patent, claims (plain language, especially claim 14).	A device that generates a drill string control signal in response to a signal from the drilling fluid pressure regulator.

SPECIAL MASTER'S RECOMMENDATIONS FOR CLAIM CONSTRUCTION – U.S. PATENT NO. 5,474,142

<u>Claim Terms</u>	<u>NOV's Proposed Construction</u>	<u>NOV Supporting Evidence</u>	<u>Omron's Proposed Construction</u>	<u>Omron Supporting Evidence</u>	<u>Special Master Bayer's Construction</u>
"signal representing those changes" "said signal representing the changes in drilling" "said first signal representing the changes in drilling fluid pressure" "said second signal representing the changes in bit weight" Claim 1: "a drilling fluid pressure regulator coupled to said drilling fluid pressure sensor."	Needs no construction.	and not "only" representing changes. This word of "manifest exclusion" should not be imported into the language of the claim. Doc.No. 25, Ex. 1 ('142 Patent) Col. 24, ll. 38 – 58; <i>Liebel Flarsheim Co.</i>, 358 F.3d at 906. 3. Dependent Claim 5 discloses a specific type of "drilling fluid pressure regulator" expressing a clear intent from the patentee not to further define this language in Claim 1. Doc.No. 25, Ex. 1 ('143 Patent), Col. 25, ll. 53 – 64. 4. See also discussion of the impermissible attempt to insert "only" below. 1. "Only" is absolute limiting language found nowhere in the patent claims. The preambles to the claims state "comprising" and do not exclude the signals from containing or representing other things (in addition to or in combination with) drilling fluid pressure or bit weight. Doc.No. 25, Ex. 1, Col. 24, 27, & 28 (Claims 1, 11, and 14); <i>Gillette Co.</i>, 405 F.3d at 1376. 2. The claims say the	"A signal that indicates the changes in only drilling fluid pressure" "A signal that indicates the changes in only bit weight"	'142 patent, claims (plain language, especially claim 14).	A signal that indicates the changes in only drilling fluid pressure. A signal that indicates the changes in only bit weight.

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said drilling fluid pressure regulator measuring changes in drilling fluid pressure and outputting a <u>signal representing those changes</u>” <u>Claim 11:</u> “producing a signal in response to changes in drilling fluid pressure, <u>said signal representing the changes in drilling fluid pressure</u>; relaying said signal to a drill string controller, and controlling said drill string controller...” <u>Claim 14:</u> “producing a first signal in response to changes in drilling fluid pressure, <u>said first signal representing the changes in drilling fluid pressure</u>; producing a second signal in response to changes in bit weight, <u>said second signal representing the changes in bit weight</u> ... selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and relaying said selected signal or signals to a drill string controller ...” “<u>relying [sic] said signal to a drill string controller</u>” “<u>Relaying said selected signal or signals to a drill string controller</u>”	Needs no construction.	signal(s) only “represent” certain parameters and do not say the signal(s) “only” represent “pressure” or “bit weight.” Doc.No. 25, Ex. 1, Col. 24, 27, & 28 (Claims 1, 11, and 14). 3. This interpretation would exclude at least four operations of the preferred embodiment: 1 (when the safety shut off valve is triggered); 2 (when the flapper closes allowing 100% of the air to be diverted to the relay); 3 (when the flow regulator 213 is used); and 4 (when there is no change in drilling fluid pressure). Doc.No. 25, at 18 – 20. These four operations are included in the claims as drafted and would be excluded if the word “only” is inserted. An interpretation that excludes operations of the preferred embodiment is “rarely, if ever, correct.” <i>Pfizer, Inc.</i>, 429 F.3d at 1373. 1. “Only” is absolute limiting language found nowhere in the patent claims. The preambles to the claims state “comprising” and do not	“sending the signal that represents changes in only drilling fluid pressure” “sending the selected signal or	‘142 patent, claims (plain language, especially claim 14).	No construction necessary.

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<u>Claim 11:</u> “producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure; <u>relaying said signal to a drill string controller</u>, and controlling said drill string controller...” <u>Claim 14:</u> “producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight ... selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and <u>relaying said selected signal or signals to a drill string controller</u> which regulates the release said drill string in response to said selected signal or signals.”		exclude the signals from containing or representing other things (in addition to or in combination with) drilling fluid pressure or bit weight. Doc.No. 25, Ex. 1, Col. 27 & 28 (Claims 11 and 14); <i>Gillette Co.</i>, 405 F.3d at 1376. 2. The claims say the signal(s) only “represent” certain parameters and do not say the signal(s) “only” represent “pressure” or “bit weight.” Doc.No. 25, Ex. 1, Col. 24, 27, & 28 (Claims 1, 11, and 14). 3. This interpretation would exclude at least four operations of the preferred embodiment: 1 (when the safety shut off valve is triggered); 2 (when the flapper closes allowing 100% of the air to be diverted to the relay); 3 (when the flow regulator 213 is used); and 4 (when there is no change in drilling fluid pressure). Doc.No. 25, at 18 – 20. These four operations are included in the claims as drafted and would be excluded if the word “only” is inserted. An interpretation that excludes operations of the preferred embodiment is “rarely, if ever, correct.”	both the signals to the drill string controller”		

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"regulates the release said drill string in response to said selected signal or signals" Claim 14: "producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight, selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and relaying said selected signal or signals to a drill string controller which regulates the release said drill string in response to said selected signal or signals."	Needs no construction.	<i>Pfizer, Inc.</i>, 429 F.3d at 1373. 1. The preamble to the claims states "comprising" and does not exclude the signals from containing other things. Doc.No. 25, Ex. 1, Col. 27 & 28 (Claims 11, and 14); <i>Gillette Co.</i>, 405 F.3d at 1376. 2. The claims say the signal(s) only "represent" certain parameters and do not say the signal(s) "only" consist of "pressure" or "bit weight." Doc.No. 25, Ex. 1, Col. 27, & 28 (Claims 11 and 14). 3. This interpretation would exclude at least four operations of the preferred embodiment: 1 (when the safety shut off valve is triggered); 2 (when the flapper closes allowing 100% of the air be diverted to the relay); 3 (when the flow regulator 213 is used); and 4 (when there is no change in drilling fluid pressure). Doc.No. 25, at 18 – 20. An interpretation that excludes these operations is "rarely, if ever, correct." <i>Pfizer, Inc.</i>, 429 F.3d at 1373. 4. There is no need for the	"the signal representing changes in only drilling fluid pressure, the signal representing changes in only bit weight, or both signals directly control the rate of release of the drill string."	*142 patent, claims (plain language, especially claim 14).	No construction necessary.

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“a decrease in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect an increase in the rate of release of said string ... an increase in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect a decrease in the rate of release of said drill string.” Claim 1: “An automatic drilling system for automatically regulating the release of the drill string of a drilling rig during the drilling of a borehole, comprising... A drill string controller coupled to said relay wherein a decrease in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect an increase in the rate of release of said string with direct effect at the drill bit associated with the drill string and an increase in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect a decrease in the rate of release of said drill string”	Needs no construction.	word “directly.” 1. See reasons to not insert “only” into the claim language described above. 2. There is nothing in the claims that discusses a “primary” or “secondary” control. Doc.No. 25, Ex. 1, (‘142 Patent) Col. 24 an 27 (Claims 1 and 11). 3. Omron is trying to limit the claims to the preferred embodiment described in the specification that says a secondary control parameter “could” be set and the invention is “capable” of operating in this manner. Doc.No. 25, Ex. 1 (‘142 Patent), Col. 20, l. 50 – Col. 21, l. 3. 4. Omron’s allegation that the doctrine of prosecution history disclaimer applies is an admission that Omron is trying to narrow the scope of these claims. 5. Prosecution history disclaimer does not apply because the patentee refused to amend the specification in view of rejections based on 35 U.S.C. §112 (written description). See, e.g., Doc. No. 39, at 25 – 26. 6. The patentee specifically	“the drill string control signal generated in response to changes in only drilling fluid pressure is the only signal that can control the rate of release of the drill string unless overridden by a different drill string control signal generated in response to changes in a different drilling parameter (either bit weight, torque or RPM)”	Disclaimer of a drilling system that can control the release of the drill string using multiple parameters simultaneously; Ex. B, 3/11/94 Office Action at 2-4 (enablement rejection); Ex. C, 6/10/94 Response to Office Action at 2-3 (applicant argued that only one parameter controls at a time); Ex. D, 8/10/94 Office Action at 2-4 (examiner maintained enablement rejection); Ex. E, 11/7/94 Response to Office Action at 3-8 (applicant expanded argument that only one parameter controls at a time); Ex. F, Notice of Allowance at 2 (examiner withdrew enablement rejection based on arguments). *142 patent 20:40-21:3, 24:4-27 (indicating that one parameter is set as primary control, others are set as secondary backup controls).	No construction necessary.

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with direct effect at the drill bit associated with the drill string."		explained to the examiner how multiple parameters can control. Doc.No. 44, at 12. This is "clear and unmistakable" intent <i>not</i> to have the claims construed as advocated by Omron. <i>Omega</i>, 334 F.3d at 1324. 7. Omron's construction would also exclude operations of the preferred embodiment since the specification describes operations where all four drilling parameters can control together (pressure, bit-weight, torque, and RPM). Doc.No. 25, Ex. 1 ('142 Patent), Col. 28, ll. 33 – 48 ("Although the operation of each of regulators 200 – 203 to control drilling operation was described individually, regulators 200 – 203 may be switched on in any combination, including all of them, to regulate the rate drill bit 20 penetrates into formation 8."). 8. The specification also provides examples where the preferred embodiment can act with two parameters controlling such as pressure and bit weight. Doc.No. 25, Ex. 1 ('142 Patent), Col. 20, ll. 50 – 59.			

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"controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents a decrease in drilling fluid pressure ... to decrease the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents an increase in drilling fluid pressure" Claim 11: "A method for automatically regulating the release of the drill string of a drilling rig drill, compromising the steps of...and, controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said		9. The Eastern District refused to adopt a similar limiting construction holding "the preferred embodiment gives several examples that describe when there is a 'decrease in drilling fluid pressure or an increase in drilling fluid pressure that does not always affect the rate of release as required by Defendant's construction." Doc.No. 25, Ex. 4, at pp. 17 -21.			
"controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents an increase in drilling fluid pressure" Claim 11: "A method for automatically regulating the release of the drill string of a drilling rig drill, compromising the steps of...and, controlling said drill string controller to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said	Needs no construction.	1. See reasons to not insert "only" into the claim language described above. 2. There is nothing in the claims that discusses a "primary" or "secondary" control. Doc.No. 25, Ex. 1, ('142 Patent) Col. 24 and 27 (Claims 1 and 11). 3. Omron is trying to limit the claims to the preferred embodiment described in the specification that says a secondary control parameter "could" be set and the invention is "capable" of operating in this manner. Doc.No. 25, Ex. 1 ('142 Patent), Col. 20, l. 50 – Col. 21, l. 3. 4. Omron's allegation that prosecution history disclaimer applies is an admission that it is trying to narrow the scope of	"the drill string control signal generated in response to changes in only drilling fluid pressure is the only signal that can control the rate of release of the drill string unless overridden by a different drill string control signal generated in response to changes in a different drilling parameter (either bit weight, torque or RPM)"	Disclaimer of a drilling system that can control the release of the drill string using multiple parameters simultaneously: Ex. B, 3/11/94 Office Action at 2-4 (enablement rejection); Ex. C, 6/10/94 Response to Office Action at 2-3 (applicant argued that only one parameter controls at a time); Ex. D, 8/10/94 Office Action at 2-4 (examiner maintained enablement rejection); Ex. E, 11/7/94 Response to Office Action at 3-8 (applicant expanded argument that only one parameter controls at a time); Ex. F, Notice of Allowance at 2 (examiner withdrew enablement rejection based on arguments). *142 patent 20:40-21:3, 24:4-27 (indicating that one parameter is set as primary control, others are set as secondary backup controls).	No construction necessary.

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signal represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents an increase in drilling fluid pressure."		these claims. 5. Prosecution history disclaimer does not apply because the patentee refused to amend the specification in view of rejections based on 35 U.S.C. §112 (written description). <i>See, e.g.</i>, Doc. No. 39, at 25 – 26. 6. The patentee specifically explained to the examiner how multiple parameters can control. Doc.No. 44, at 12. This is "clear and unmistakable" intent <i>not</i> to have the claims construed as advocated by Omron. <i>Omega</i>, 334 F.3d at 1324. 7. This would also exclude operations of the preferred embodiment since the specification describes operations where all four drilling parameters can control together (pressure, bit-weight, torque, and RPM). Doc.No. 25, Ex. 1 ('142 Patent), Col. 28, ll. 33 – 48 ("Although the operation of each of regulators 200 – 203 to control drilling operation was described individually, regulators 200 – 203 may be switched on in any combination, including all of them, to regulate the rate drill bit 20 penetrates			

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		into formation 8.”). 8. The specification also provides examples where the preferred embodiment can act with two parameters controlling such as pressure and bit weight. Doc.No. 25, Ex. 1 (“142 Patent”), Col. 20, ll. 50 – 59. 9. The Eastern District refused to adopt a similar limiting construction holding “the preferred embodiment gives several examples that describe when there is a decrease in drilling fluid pressure or an increase in drilling fluid pressure that does not always affect the rate of release as required by Defendant’s construction. Doc.No. 25, Ex. 4, at pp. 17 -21.			