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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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PETROLEUM GEO-SERVICES INC.  
Petitioner

v.

WESTERNGECO LLC  
Patent Owner

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Case IPR2014-00689  
U.S. Patent No. 7,293,520

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**CORRECTED PATENT OWNER RESPONSE**

Pursuant to 37 C.F.R. § 42.120, Patent Owner, WesternGeco L.L.C (“WesternGeco” or “Patent Owner”), submits this Response to the Petition for *Inter Partes* Review (“Petition”) of U.S. Patent No. 7,293,520 (the “’520 patent”) filed by Petitioner, Petroleum Geo-Services, Inc. (“PGS” or “Petitioner”).

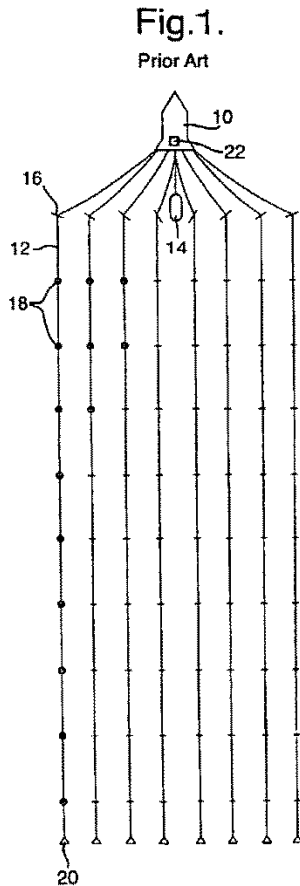
## TABLE OF CONTENTS

I.	THE '520 PATENT CLAIMS PRECISION CONTROL OF STEERABLE SEISMIC ARRAYS .....	1
II.	CLAIM CONSTRUCTION .....	6
	A. Feather Angle Mode.....	7
	B. Streamer Separation Mode.....	9
III.	PRIOR ART.....	10
	A. Workman .....	10
	B. Hedberg .....	15
IV.	THE '520 PATENT IS NOT ANTICIPATED OR OBVIOUS.....	19
	A. Claim 1 and 18 Are Not Anticipated By Workman.....	19
	i. Workman does not disclose each and every limitation of claims 1 or 18.....	19
	ii. Workman Does Not Disclose a Control System Configured to Operate in One or More Control Modes as Recited in Claims 1 and 18 .....	19
	iii. Workman Does Not Disclose a Control Mode Selected from a Feather Angle Mode, a Turn Control Mode, and a Streamer Separation Mode.....	20
	B. Workman Does Not Render Claims 1, 2, 18 and 19 Obvious .....	23
	i. Workman Does Not Render Obvious the Streamer Separation Mode .....	25
	ii. Workman Does Not Render Obvious the Feather Angle Mode .....	28
	C. Claims 1, 2, 18 and 19 Are Not Anticipated by Hedberg .....	34
	i. Hedberg Does Not Disclose The Claimed Invention .....	34

ii.	Hedberg Lacks a Streamer Separation Mode .....	35
iii.	Hedberg Lacks a Feather Angle Mode .....	38
D.	Claims 1, 2, 18 and 19 Are Not Obvious In View Of Hedberg. ....	41
i.	Hedberg Does Not Render Obvious the Streamer Separation Mode .....	41
ii.	Hedberg Does Not Render Obvious the Feather Angle Mode .....	44
V.	SECONDARY CONSIDERATIONS OF NONOBVIOUSNESS .....	47
VI.	THE PETITION IS TIME-BARRED UNDER 35 U.S.C. § 315(b) .....	49
A.	ION is an Unnamed RPI.....	49
i.	<span style="background-color: black; color: black;">[REDACTED]</span> .....	49
ii.	ION’s Involvement with Petitioner.....	51
iii.	ION is an RPI Under the Guidelines .....	53
iv.	Additional Discovery was Prejudicially Denied.....	56
B.	Multi Klient Invest AS is an RPI .....	57
C.	Service .....	58
VII.	CONCLUSION.....	60

## I. THE '520 PATENT CLAIMS PRECISION CONTROL OF STEERABLE SEISMIC ARRAYS

The '520 patent covers methods and apparatus for laterally steering a



plurality of streamer positioning devices along an array of streamers using one or more of three different control modes. Although the need for control systems for streamer steering was known for years, no one in the industry had succeeded in developing the capability of streamer steering along the length of the streamer prior to the '520 patent. This was due to the challenges in constructing a functioning system capable of controlling hundreds of positioning devices at once, as well as designing the devices themselves.

Early streamer positioning involved rudimentary devices such as deflectors and tail buoys. (Ex. 1001, 3:43-45; Fig. 1 elements (16) and (20), respectively)<sup>1</sup> Deflectors were attached to the front end of the streamer

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<sup>1</sup> Although Figure 1 of the '520 patent is captioned as “prior art,” one of ordinary skill would recognize that much of that figure was in fact not prior art, but instead constituted inventive contributions to the state of the art, such as the global control system, its functionality (e.g., predictive analysis, control modes,

and used to horizontally spread the end of the streamer nearest the seismic survey vessel. (Ex. 1001, 3:45-47.) The tail buoy created drag on the end of the streamer farthest from the seismic survey vessel. (Ex. 1001, 3:47-49.) The tension created on the seismic streamer because of the deflector and tail buoy resulted in a roughly linear shape of the streamer. (Ex. 1001, 3:49-52.) Tail buoys floated at the surface and could rely on GPS to determine their positions. Deflectors attached to the front of the array and created fixed spacing through tension at front of the system. No steering was provided for the miles of length along the streamer.

Streamer positioning devices are generally spaced every 200 to 400 meters along the length of a streamer. (Ex. 1001, 3:56-58.) For a modest streamer array, this means hundreds of separate streamer positioning devices are deployed on a given array. Simultaneously controlling this multitude of independent positioning devices is no easy feat. While it is easy to set a target depth and little risk exists if that depth is overshoot, lateral steering requires considerations of the dynamic movement of neighboring streamers and obstructions along miles of cable deployed in the ever-changing open-water environment of the deep seas. Unless

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streamer positioning device control, etc.), and the distributed processing control architecture. (Ex. 2042, ¶ 67.)

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