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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PETROLEUM GEO-SERVICES INC.
Petitioner

v.

WESTERNGECO LLC
Patent Owner

Case IPR2014-00688
U.S. Patent No. 7,080,607

PATENT OWNER RESPONSE

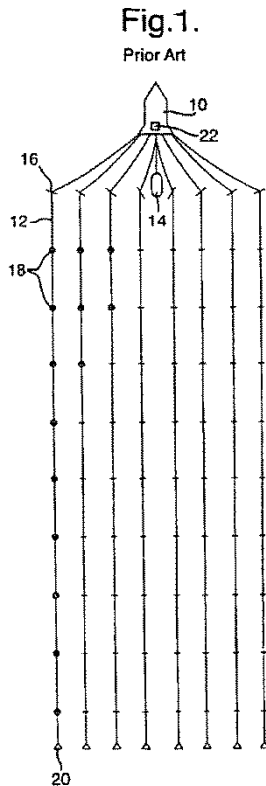
Pursuant to 37 C.F.R. § 42.120, Patent Owner, WesternGeco L.L.C (“WesternGeco” or “Patent Owner”), submits this Response to the Petition for *Inter Partes* Review (“Petition”) of U.S. Patent No. 7,080,607 (the “’607 patent”) filed by Petitioner, Petroleum Geo-Services, Inc. (“PGS” or “Petitioner”).

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I. THE '607 PATENT CLAIMS PREDICTIVE STEERING OF STREAMER ARRAYS

The '607 patent covers methods and apparatus for using predicted positions of streamer positioning devices to calculate steering commands in order to steer



miles-long streamer arrays despite limited location data in order to better image geological structures, improve the streamers' effectiveness, repeat surveys over time to manage resource recovery, and more safely and rapidly deploy and turn the arrays.

Early streamer positioning involved rudimentary devices such as deflectors and tail buoys. (Ex. 1001, 3:34-39; Fig. 1 elements (16) and (20, respectively)¹. Deflectors were associated with the front end of the streamer and used to

¹ Although Figure 1 of the '607 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, streamer positioning device control, etc.), and the distributed processing control architecture. (Ex. 2042, ¶ 67).

horizontally spread the end of the streamer nearest the seismic survey vessel. (*Id.* at 1:34-41.) Tail buoys were associated with ropes or cables secured to the end of the streamer furthest from the seismic survey vessel, and created drag on that end of the streamer. (*Id.* at 1:39-41; 3:37-39.) The tension created on the seismic streamer by the deflector and tail buoy resulted in a roughly linear shape. (*Id.* at 1:34-41.) 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 or lateral forces were 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, 1:48-49.) 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 dynamical movement of neighboring streamers and obstructions along miles of cable deployed in the ever-changing open-water environment of the deep seas. Unless properly controlled, lateral steering can make streamer arrays more dangerous than no steering at all.

The complexity of these streamer arrays led to several widely

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