UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GREENE'S ENERGY GROUP, LLC,

Petitioner,

v.

OIL STATES ENERGY SERVICES, LLC,

Patent Owner.

Case IPR2014-00216
Patent No. 6,179,053

Case IPR2014-00364
Patent No. 6,289,993

DECLARATION OF L. MURRAY DALLAS

I, L. Murray Dallas, hereby declare as follows:

1. I am over 18 years of age and personally competent to make this declaration, having personal knowledge of all facts set forth herein.

2. I am presently an employee of Oil States Energy Services, LLC ("OSES"). I have been employed by OSES since 2005, when OSES acquired Stinger Wellhead Protection, Inc. ("Stinger"), a company I founded in 1998. Between 1998 and 2005, I was the owner of Stinger and held various executive titles there. I have worked in the oilfield business since 1972, and am the named inventor on dozens of issued U.S. patents.

3. When operators of oil & gas wells want to stimulate well production, they will often use a technique known as hydraulic fracturing. The fluid used in hydraulic fracturing can be corrosive and/or abrasive, and is generally pumped into the well at very high pressures. Accordingly, to avoid damage caused by the fluid, the wellhead and other aboveground components generally need to be protected or isolated during hydraulic fracturing operations. That isolation is generally achieved using wellhead isolation tools.

4. Prior to the mid-1990s, it was relatively rare for operators to perform "multistage" hydraulic fracturing, in which several different locations within a well are stimulated in succession. During this time, the most common wellhead isolation tools were casing savers and tree savers, both of which must be removed

from the wellhead between each fracking stage, and then reinstalled for the next stage.

5. Multistage fracking began to become more prevalent during the mid-1990s, in large part due to the efforts of George Mitchell and his company, Mitchell Energy. In multistage fracking, a casing saver or tree saver is inconvenient and expensive because it must be installed and removed every time a new stage is stimulated. Accordingly, in or around 1996, I began trying to develop a wellhead isolation tool that would deliver superior performance for multistage fracking jobs without removing the tool between stages.

6. In or around early 1997, I conceived of a tool that Stinger came to refer to as the “blowout preventer protector” or “BOP protector.” I filed a patent application for this tool in the U.S. and another one in Canada (Canadian Patent Application No. 2,195,118). The U.S. application eventually issued as U.S. Patent No. 5,819,851. The Canadian application issued as Canadian Patent No. 2,195,118.

7. During 1997, Stinger worked on building a commercial embodiment of the tool described in what would become the ’851 Patent. We finished construction and began using this BOP protector in or around the fall of 1997. Over the course of the next several months, it quickly became apparent that this

BOP protector did not function as intended and was not suitable for use in multistage fracking operations.

8. The problem with the BOP protector arose from the fact that the seal assembly, which was located at the bottom of the mandrel, was intended to be held in place exclusively by hydraulic fluid pressure pushing down on the mandrel. The hydraulic fluid pressure was simply not capable of reliably holding the seal assembly in position against the upward pressure exerted by the fracking fluid, as well as the natural formation within the wellbore. There were numerous variables that led to this problem. The first such variable was the frequent and rapid changes in fracking pressure, caused by changes in the rate at which fracking fluid was being pumped downhole. These changes in fracking pressures, in turn, necessitated changes in the hydraulic pressure that would have been necessary to hold the mandrel in place. At the time this tool was being used, I had developed a chart that was intended to tell the operator what level of hydraulic fluid pressure applied to the top of the mandrel was necessary to maintain the mandrel in the operative position. However, I realized quickly that it was simply not practical for the operators to make this kind of adjustment in real time, particularly given the complexity of these systems.

9. There were numerous other factors that made the operation of the BOP protector extremely unpredictable, even with the charts I had developed.

Those factors included the momentary pressure spikes caused by piston strokes in positive displacement pumps, movement of the cup tool caused by swaying of the tool itself, the unknown compressibility of the hydraulic fluid (given the possible presence of entrained air), the possible contraction of the fluid due to temperature differences, and the often uneven surface of the bit guide against which the cup tool was required to seal.

10. Several of these factors were made worse by the required height of the tool described in the ’851 Patent. Because a setting tool was integrated into its design, the tool itself had to be long enough to provide the entire distance for the mandrel to stroke into the wellhead. I believe the BOP protector that we built was approximately five feet high, with an available stroke of approximately four feet. This distance was insufficient to use the tool on many wells, especially those with multiple blowout preventers or other components mounted on top of the wellhead. Nevertheless, the tool could not be made any higher without causing severe safety and operational problems, including excessive vibration and sway. Even with the tool as built, I was often not comfortable with its height, particularly when it was mounted more than a few feet above the ground. My concern over the high profile of this tool was one of the primary reasons I eventually designed the tool claimed in the ’053 Patent.

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