



Figure 1: Revolution Pump Test

Revolution Pump to Extract Heavy Oil

TMI-21 is a patented Russian pump technology proven in Norway and exclusively licensed to 21st Century Fox for the America's and certain other places around the world. This technology is controlled by Kjell Finstadt, President of 21st Century Fox. DRC is interested in seeing it developed because of some shallow undeveloped heavy oil deposits DRC has identified.

A Non-Disclosure Agreement must be signed with Kjell for details of the technology. Public Domain information includes the facts this new artificial lift technology was developed to move sludge in sewer systems. The sludge can be almost solid waste, which has similarities to heavy oil. The pump has simple deployment and reduced downhole complexity. The pump sits at the surface, and all moving parts are removed from the well fluid and flow. It has less power consumption than traditional pumps. Figure 1 shows the location of one of the ski slope tests performed by 21st Century Fox at a ski lift in Norway. The pump was tested at a 650 foot heavy oil field in West Texas in June 2011 and had a 7,500 foot in Luling in November 2011.

DRC proposes a \$13,750,000 investment in exchange for 31.5% ownership. This investment will be used to cover revolution pump fabrication and marketing costs in exchange for DRC to have the rights to use the revolution pump on heavy oil projects worldwide. The revolution pump could have a significant impact on the Da Qing Oilfield's ability to produce heavy oil. The value of improving heavy oil production various places around the world is significant.

The value of this technology as a new type of artificial lift is summarized in the following e-mail from Apache:

> From: King, George <George.King@apachecorp.com>
> Date: Thu, Oct 6, 2011 at 12:54 PM
> Subject: The Revolution Pump
> To: Kjell Finstad <kjellgfinstad@gmail.com>

6 October 2011

Dear Kjell:

My role with Apache Corporation enables me to examine new equipment and technologies in the fields of completions and production where I regularly assist with fracturing, water treating and artificial lift as well as other engineering and chemically oriented activities. One of the gas production industry's critical needs is a small rate pump capable of lifting small to moderate amounts of condensate and water from gas wells (deliquification) to enable low pressure gas to be produced without the backpressures associated with standing liquid that is produced with and/or condenses from flowing natural gas.

On 8 June 2011, I witnessed testing of your CIG 1 pulse pump, at a shallow field south of San Antonio, Texas. That particular test, which was conducted on a new 1,600 foot horizontal well with a vertical depth of 625 feet, was impressive taking into account that major components and power supply for the pump is at surface. This type of pump will require significantly less expense in maintenance and repair. I watched the pump efficiently lift liquids from the well at a flow of about 100 to 250 barrels per day, with obvious solids in the fluid.

I am impressed with the capabilities and capacities of the Revolution Pulse Pump CIG 1. Based on my observations and understanding of the concept of operation, I believe the pump may also work in deeper wells. I am looking within Apache for a low rate gas well with liquid loading problems to serve as a test well. Our wells are generally at 7000 to 12,000 feet and some have liquid loading problems. I will feature a short presentation of the potential of this pump at Apache's Technology Forum for worldwide Apache participation October 19-21. I hope to find a test case for the pump in the mid-continent area of the US or in Canada.

The market for a pump that proves successful in economically dewatering gas wells and could also be used in fully horizontal wells is large. In the mid-continent of the US, there are an estimated 50,000 gas wells that have problems with liquid loading. The horizontal shale wells are another target with very large potential for dewatering with minimum equipment in the well. The pump may also have potential with other lift cases, but I am focusing on the deliquification problem due to the large number of wells. There are few economic alternatives for this type of deliquification and none will work in a horizontal well with solids.

There are several other major gas producers that have shown interest in this type of lift system including BP and Marathon.

I am available to discuss my thoughts and intent for this pumps as needed.

George E. King

Global Technology Consultant

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