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Print This Techline
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Techlines (News)

Speeches

Congressional Testimony

Upcoming Events

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DOE-backed Consortium Delivers Six New Commercially-Ready "Stripper Well" Technologies

Technologies Hold Promise to Boost Domestic Oil and Gas Production

Washington, DC — Joint ventures in technology development by government and industry have delivered six new deployment-ready applications in four years to extend the useful life of more than 650,000 stripper wells that deliver almost 15 percent of America's domestic oil production and almost eight percent of natural gas production, a Department of Energy review has determined.

The technologies were developed by the Stripper Well Consortium, an industry-directed group whose research, development and demonstration efforts are co-funded by the Department of Energy through the National Energy Technology Laboratory's Strategic Center for Natural Gas and Oil. The six new technologies that have been commercialized, or are near commercialization, generally serve the purposes of increasing production, raising efficiencies or lowering costs. The Consortium has been active in bringing along more than 55 additional technologies, some of which are approaching commercial readiness.

The United States has 393,000 oil stripper wells and 260,000 natural gas stripper wells, and they are typically operated by small, independent companies in fields that are long past their peaks. The definition applies to oil wells delivering no more than 10 barrels per day and gas wells delivering no more than 60,000 cubic feet per day.

But without the stripper wells' aggregate production, the United States would have to import an additional 860,000 barrels of oil a day (an increase of seven percent), and 1.5 trillion cubic feet of natural gas (an increase of 38 percent).

Life extension technologies will reduce plugging and abandonment rates and sustain the stripper wells' contribution to U.S. energy supply and security. In 2002 alone, more than 3,800 gas wells and 14,000 oil wells were abandoned, even though most were still producing. Once stripper wells are plugged and abandoned, the costs to re-access the reserves are prohibitive, and the energy resources may be lost forever.

The six deployment-ready applications are:

- ▶ **Gas Operated Automatic Lift (GOAL) PetroPump** – Brandywine Energy & Development Co. has developed a gas-operated automatic plunger lift tool to remove fluids from stripper wells which will result in increased production. The system is unique in that it operates automatically using an on-tool, pressure-activated valve that is pre-set to retrieve and deliver a fixed volume of fluid during each run; it automatically returns to the well bore for additional fluid when required. The tool has low maintenance and service requirements, which is generally limited to changing the cup seals after several months of operation. It is inexpensive to operate because it requires no external energy source and limited manpower.
- ▶ **Vortex Flow Tools** – Vortex Flow, LLC, has developed a revolutionary vortex flow regime that accelerates the velocity of water and reduces the friction that causes pressure drops as fluids flow through a pipe, resulting in far greater efficiency when moving fluids. These tools have been proven to increase production and lower maintenance costs. Test results have shown that Vortex surface tools eliminate water buildup in low spots in flow and gas gathering lines, reducing upstream pressures. Over 200 Vortex surface tools have been installed in gas gathering and production flow lines across the United States.

Another Vortex tool is designed for installation at the bottom of tubing and reduces the pressure drop up the tubing string, thereby reducing the gas flow needed to lift liquids up the wellbore. As a result of the success of these tools, Vortex Flow, LLC, won the Platts' 2004 Global Energy Newcomer of the Year Award.

- ▶ **Hydraulic Diaphragm Electric Submersible Pump** – Pumping Solutions, Inc., now part of Smith Lift, LLC, has developed a new type of pump based on a hydraulic driven diaphragm, which has proven to be tolerant of fines and has allowed placement of the pump inlet below the perforations in sandy wells. Its performance advantages include the following: pumps coal fines and solids at higher concentrations than traditional systems; pumps gas/liquid mixtures; pumps dry/off with no damage within motor limits; pumps any viscosity whether high or low; has constant output with depth; and is highly efficient with reduced electric costs.
- ▶ **Weatherbee Pump** – W&W Vacuum & Compressor, Inc., is developing a novel type of variable capacity compressor/pump for low productivity gas production operations. The new pump will have lower initial costs and lower operational costs compared to existing technology. The new compressor has four rotating chambers, which provides four intake and four exhaust strokes in each 360 degree rotation. The pump economizes motion by loading two chambers while two chambers are unloading. Since the pump has no corners or "dead spots," no fluids are trapped. The pump has a capacity control mechanism which allows the flow rate of the device to be varied to meet increased or decreased demands without changing the rotation rate of the drive shaft. The pump functions equally well whether rotating clockwise or counterclockwise, can be mounted in any position without affecting normal operations, and can handle high BTU gas. The pump is substantially smaller and lighter than existing products on the market.
- ▶ **Chemical Injector for Plunger Lift Gas Wells** – Composite Engineers, Inc., has developed a simple, economical chemical system called the Plunger Conveyed Chemical System, which reduces wellbore corrosion and maintenance costs. It consists of five moving parts, most of which are in the chemical chamber located on the top of the well. A standard oilfield chemical pump charges the chemical chamber with any liquid chemical such as corrosion inhibitors, foaming agents or paraffin solvents, or even a combination of chemicals alternately. The entire system can be installed in about 15 minutes without special tools. The system does not change the plunger performance or well characteristics and is field-proven.
- ▶ **Low-Cost Real-Time Downhole Wireless Gauge** – Tubel Technologies, Inc., has developed a new downhole wireless gauge that addresses the needs of oil and gas producers for a simple system to automate and optimize hydrocarbon production. The system eliminates cables, clamps, and splices inside the wellbore, increasing reliability, lowering costs and significantly reducing the time required for deployment of the completion system in the well. The tool currently monitors temperature and pressure, but additional parameters can be added. This new technology can be used both in permanent and service applications. The wireless gauge can also provide reservoir evaluation with formation build up tests to optimize production and maximize the amount of hydrocarbon that can be extracted from the wellbore.

- End of *Techline* -

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[Return to top of page >](#)

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