

## Executive Summary

### **Low Cost Downhole Power Generator for Downhole Gauges in Plunger Lift Wells**

Optimization of the processes required to produce hydrocarbons constitutes an on going strategic concern and a major goal in the oil and gas industry. The goal of this project is to develop a low cost downhole power generator for downhole gauges in plunger lift wells application to achieve the following: monitor the rod pump lifting process in wells, transmit well production information in real time from downhole to the surface, lower gauge costs, improve pump reliability and monitor water levels during the production of hydrocarbons. The purpose of monitoring the rod pump process is to optimize the production and to minimize the amount of down time and lost production from wells. This new system will generate power downhole to operate a wireless gauge also deployed inside the well. The generator will have a coil assembly mounted as part of the tubing string, a rod which will be assembled as the lower section of the rod assembly and a power harvest system. The rod will be composed of permanent magnets that will be placed on the outside of the rod. The up and down motion of the rod and magnets through the coil assembly will generate electricity that will power the gauge downhole. There will be no cables from downhole to the surface and the entire installation can be done within a fraction of the time that it now takes to deploy a gauge in a rod pump well. This project will research, develop and test a low cost, high reliability power generator using the plunger lift as the means to generate the power. This system will help reduce well down time, increase hydrocarbon production and reduced OPEX.