

## **Crisman Proposal**

### **Title: Modular Power for Drilling Rigs:**

#### **Goals**

*Reduced Cost, Lower Emissions, and Smaller Footprint for Drilling Operations*

#### **Project Objective**

Develop a prototype module, electrical grid based, with capability of replacing diesel/generator packages for drilling and completion operations.

Identifying interested sponsors in GPRI members to provide industrial expertise and develop a working application.

#### **Background**

A study team in 2008 measured the power usage of a new generation light weight drilling rig (Huisman KOC 250) during drilling operations in South Texas. Compilation of the power data and a subsequent engineering study has shown that it is possible design a low cost transmission line to connect the rig to the electrical grid and provide sufficient power for drilling operations. A key to a cost effective design was to “load level” power from the grid, removing energy surges, by incorporation of energy storage devices. An example design of utilizing kinetic energy storage (KERS) coupled with a 2-mile power transmission line, and the necessary switching circuits, could be built and fit within the given physical dimensions and standards of an ISO container. (Verma and Burnett, 2009).

#### **Description of Project**

A three year study is proposed to develop the engineering designs of a working application of the power module. The study would advance preliminary studies and investigate key components of such a system i.e.

- Other energy storage and recovery technology
- Advanced switching designs and power output.
- Design features of high power, temporary transmission lines
- Design links to the rig power bus.
- Safety, environmental, and regulatory issues involved in application of the new technology.

#### **Project Management**

The project would be a part of the Environmentally Friendly Drilling Program managed by the Houston advanced Research Center (HARC, led by Dr. Rich Haut

(<http://www.efdsystems.org>). D. B. Burnett of the Department of Petroleum Engineering at Texas A&M University will be the Principle Investigator of the Mobile Power project along with co-PI Dr. Alan Palazzola of the Department of Mechanical Engineering. Mr. Burnett is the Director of Technology for GPRI (<http://www.gpri.org>) and co-manages the EFD program along with Dr. Haut. Dr. Palazzola leads the Vibration Control and Electromagnetic Laboratory (<http://www.tamu.edu/tamu-vcel/>).

## **Deliverables**

- Design of the key components of the power unit would be validated.
- A model for a set of possible field configurations for single and multiple rig operations (centralized power)
- A robust engineering design for a cost-effective mobile power unit for drilling rigs.

## **Schedule and Cost**

Sponsor fees for the project are \$100,000 for three years. Sponsors would serve as Advisors to the project managers, and help to establish milestones and deliverables from the research. They would also share IP developed from the project.

Preliminary meetings are underway to select a qualified GA and to acquire information on diesel engine performance. Depending on the level of support, the project could take more than the entire three years, or be completed at the conclusion of the current EFD program (end date Summer 2011).

## ***Value of the Project to Sponsors***

Business benefits come from less costly use of electrical power from the Grid, elimination of infrastructure necessary to support diesel/generator packages on rigs, and a safer environment to work. Environmental benefits stem from reduced environmental footprint because of elimination of emissions from drilling operations.

A cost benefit analysis of the containerized system to transfer grid power to a rig, coupled with the KERS indicated that such a design had the potential to save more than \$10,000 per week of drilling operations with significantly lower emissions, quieter operation, and smaller size well pad.

## **Contact Information**

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