



**National Renewable Energy Laboratory**

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June 30, 1999

Exhibit A  
Response to Question #7

Describe the government project, agency and contract number

U.S. Department of Energy  
Contract number: DE-AC36-98GO10337

The National Renewable Energy Laboratory is a private organization under contract with the US Department of Energy to provide research and development capabilities in the field of renewable and sustainable energy development.

As part of these activities NREL is responsible for monitoring remote power stations around the world. This system will be set up at our test facility in Golden Colorado and will be attached to a wind based hybrid power system. It will be used to familiarize test and field engineers in the operation of remote system monitoring using satellites. Other systems will be installed at other hybrid systems around the world as part of specific projects.

Exhibit B  
Response to Question #9

Project description

- a) Nature of the research project: NREL is responsible for monitoring the operation and performance of remote power systems around the world in order to determine their operation and methods of expanding this technology. In many cases the systems are installed in areas with little or no public facilities such as telephones or cell phone coverage. In these areas the only way to get timely system operation and performance data is through the use of a satellite communications. Since NREL field engineers will be responsible for the installation and operation of the satellite transmitter, the installation of a unit at our test facility before a system is installed overseas is seen as an important process.
- b) When field engineers are sent to complete the installations of data acquisition equipment at plants overseas they have only a limited amount of time to complete this task. These engineers need to be able to understand the operation and instantiation of the satellite transmitter equipment prior to departing to the remote location. The data collected from each site is used to ascertain the operational status of the power system and collect long term performance data in order to determine system modifications and improvements. Without the use of satellite technology it can take more than 6 months to retrieve data from each system.
- c) NREL currently uses cell phone and manual collection of data from remote sites. In many areas there is no cell phone coverage and the installation of landlines is not an option. In these cases the only option compared to manual data collection is through the use of satellite technology. At the proposed site of installation for this system there is cell phone service but we require this unit to allow engineers to obtain experience working with the technology before it can be successfully implemented in remote field applications.