

**SOUTHWEST WINDPOWER INC**  
Job Description

**Job Title:** Embedded Software Engineer  
**Department:** Research and Development  
**Reports To:** Chief Technical Officer  
**FLSA Status:** Exempt  
**Prepared By:** Office Manager  
**Prepared Date:** 3/20/07  
**Approved By:** CTO  
**Approved Date:** 3/20/07

**Summary:** Will be part of a research team focused on development and testing of wind turbine controllers and inverters. The team consists of approximately 15 people in the areas of physics, aerodynamics, hardware, software, and modeling, among others.

**Essential Duties and Responsibilities include the following.** Other duties may be assigned.

- Contributes to the research, develop, design, and testing of wind turbine controllers and inverters.
- Develops a wide variety of software from machine language control to higher levels such as graphical user interface.
- Primarily focuses on writing C software for embedded controllers.
- Consults with other engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.
- Formulates and designs software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design.
- Develops and directs software system testing procedures, programming, and documentation.

**Supervisory Responsibilities**

This job has no supervisory responsibilities.

**Qualifications** To perform this job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

### **Education and/or Experience**

- Bachelor's degree (B. A.) or Bachelor's of Science (B.S.) degree in Computer Science or Engineering from four-year college or university.
- Extensive experience programming in C/C++ for embedded systems.

### **Mathematical Skills**

Ability to apply advanced mathematical concepts such as exponents, logarithms, quadratic equations, and permutations. Ability to apply mathematical operations to such tasks as frequency distribution, determination of test reliability and validity, analysis of variance, correlation techniques, sampling theory, and factor analysis.

### **Computer Skills**

To perform this job successfully, an individual must demonstrate the following:

- An understanding of how a microcontroller interacts with the hardware:
  - PWM
  - A/D Converter; and
  - Period/Frequency Calculating
- Experience with interrupt-based programming
- Experience debugging embedded systems
- Familiarity with serial interfaces (UART, SPI, etc.)
- Excellent debugging, math, logic, and engineering skills
- Creative thinking

### **Other Skills and Abilities**

Experience with the following desired:

- Labview, Java, Matlab, and Mathematica
- RF Communications (specifically Chipcon transceivers)
- Linux and GCC
- Power supply design
- FET and IGBT drives/power electronics
- UL 1741/IEEE 1547 familiarity
- FCC conducted and radiated emissions familiarity
- RF transmitter/receiver design

### **Other Qualifications**

Experience in renewable energy preferred. Please visit our website at [www.windenergy.com](http://www.windenergy.com) for some background information on Southwest Windpower.

**Work Environment** The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is frequently exposed to moving mechanical parts. The employee is occasionally exposed to high, precarious places; outside weather conditions and risk of electric shock. The noise level in the work environment is usually moderate.