PORTABLE WATER PURIFICATION SYSTEM SENIOR DESIGN PROJECT

Project Sponsor / Client: Labrusca Scientia, LLC

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Project Term: Spring 2012 – Fall 2011

SDSM&T Project Program: Industrial Engineering & Engineering Management

SDSM&T Project Instructor:
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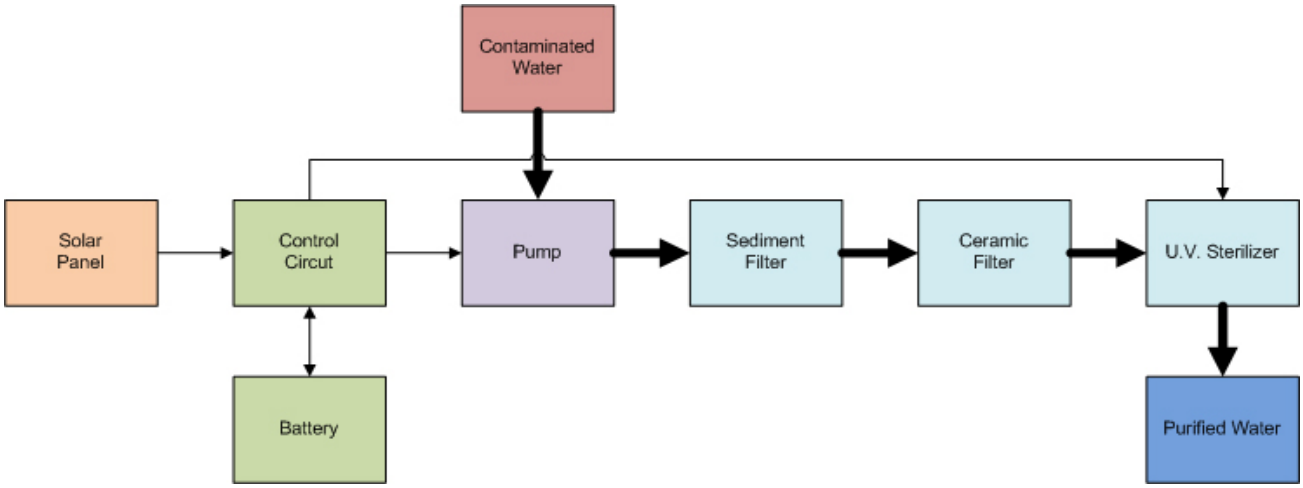
Project Overview:

Last year (Spring 2010 – Fall 2011), a group of interdisciplinary senior design students at SDSM&T worked to develop a prototype of a portable water purification system that produces clean, drinkable water for contaminated fresh water locations and is powered by renewable energy. (See Figure 1 below for block diagram.) The group of students then traveled to Chile to test and implement the prototype at an orphanage construction site in the Andes Mountains where the prototype is currently in use. Due to the success of the project, these students have now created a limited liability company (Labrusca Scientia, LLC) to develop even better portable water purification system technologies. The company would work with senior design students at SDSM&T to help with the product development.



The design of the entire system is being revisited to optimize the product for movement into production. The main objectives of this project are detailed below:

- Design and develop a lightweight containment for the entire system that is ergonomic and fits the carry-on size constraints of airline travel
- Optimize the flow rate through the pump/filtration system
- Optimize the power storage and generation, while lowering power consumption
- Integrate necessary sensors and improve the user interface system

Student project team members will survey the current production and inventory control processes, and report to the supervisors as necessary to verify correct operation of their designed system(s).

Project Background:

Labruscsa Scientia, LLC is developing a portable water purification system that produces clean, drinkable water for contaminated fresh water locations and is powered by renewable energy. This is an interdisciplinary project requiring the technological knowledge from the following engineering backgrounds: Mechanical, Electrical, Environmental, and Industrial. This portion of the proposal details the Industrial Engineering requirements and deliverables as seen by the client and for a successful project.

Project Team Requirements and Deliverables Description:

This project will require a team of at least four, interdisciplinary, senior design students. This project may require only one IE student, but the client is willing to work with the senior design coordinator to ensure adequate projects for a maximum of two IE students. The students will be required to work with the other senior design students, attend weekly meetings and provide reports to the client as requested. The following deliverable items are expected for this project:

IE Student 1
Primary Objective: To ensure proper ergonomics and safety of the water purification system. The student will need to work entirely hand in hand with the respective ME and ENVE on this portion of the project.
Secondary Objective: To assist in the optimization of: lowered power consumption, increased flow rate, and manufacturing process.

IE Student 2
Primary Objective: Observe the manufacturing and design process of the first prototype for value. Recommend ways to add value to the system as a whole in order to achieve high market placement.
Secondary Objective: Work with Lucas Haan on developing a scale-up and commercial production plan.

These items are expected within the time frames and along with the other deliverables described in the Industrial Engineering and Engineering Management Senior Design Projects document. That document provides a more complete description of the process, deliverables, and timing of SDSM&T IEEM Senior Design Projects.