

## Progress Report

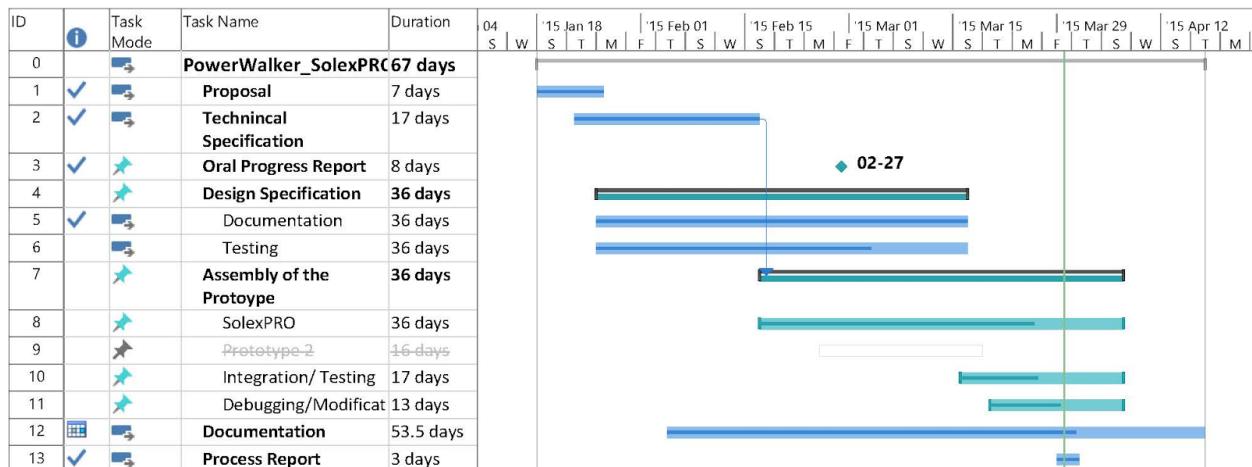
### Introduction

At POWER WALKER, we are developing a new way to harvest wasted energy. Our product, the SolexPRO aims to convert kinetic energy from the motion of the feet to electrical energy, which is stored as electrical potential in a set of batteries.

We are currently working on testing and implementation of the SolexPRO, its sub-components, and its circuitry.

### Schedule

As shown in the original Gantt Chart (Figure: 1), we planned to finish our project by April 1st, 2015. However, our planned integration and testing is taking more time than anticipated due to a faulty solenoid design. Fortunately, we budgeted float time for delays and scheduling issues as seen on the Gantt Chart below. Thus we are confident we will finish our project by April 13th, 2015.



**Figure 1: Gantt Chart**

### Finances

Currently we have spent \$417.01 out of \$647.50 (our original cost estimate). The table below outlines the finances that have been made to date.

**Table 1: Expenditure and Fund Balance**

Original Amount Requested	\$647.50
Funding Received (ESSEF)	\$500.00
Amount Spent	\$417.01
Future Expenditure	\$200.00
Amount Left for Contingency	\$82.99

We received a total funding of \$500 from Engineering Science Student Endowment Fund (ESSEF). In case of further unexpected expenses that exceeds the contingency fund, Wighton Fund will be applied for .

### **Progress Report:**

#### **Research and Development:**

SolexPRO consists of two different subunits called the Energy Harvesting Unit (EHU) and the Energy Storage Unit (ESU). These subunits are built and tested separately and then integrated in the system as a whole. Different stages of research and development are mentioned below:

#### **Stage 1:**

The main objective of the SolexPRO is to be able to harvest energy from walking. The energy harvesting unit converts kinetic energy produced by walking into re-useable electrical energy. Thus the first stage focuses on testing with different size/length solenoids and magnets in order to achieve maximum output and efficiency. In addition, other factors such as durability and sustainability are taken into the account.

#### **Stage 2:**

Storing the harvested energy is a crucial aspect of our project that allows the user to access the energy when needed. Therefore, the second stage focuses on building different circuitries and trying different batteries in order to achieve the highest efficiency, functionality, and performance.

#### **Stage 3:**

The last stage is the integration of the two subunits into a single unit. At this stage the tester will walk approximately 3 hours while wearing SolexPRO to perform the final testing. Further optimization and corrections will be made at this stage.



### Design and User Experimentation:

The design procedures chosen are strongly based on making SolexPRO comfortable, durable and appealing. Thus the user-input was taken from all members of the team which do a significant amount of walking on each given day.

### Material Acquisition and Testing:

All the materials have been ordered and arrived. There are only a few optimization parts to be printed on April 3rd, 2015 for the energy harvesting unit to be tested in stage 3 of research and development.

### Documentation:

Our documentation is done in a timely manner. We used a late submission for the functional specification report.

### **Remediation**

POWER WALKER is still on track with prototyping. However the original solenoid that was 3D printed lacked durability due to a faulty design. Therefore three revised designs have been submitted to Gary Shrum for reprinting and estimated to be delivered to us on April 3rd, 2015. The new designs have added thickness to the walls of the solenoid and multiple guides for the copper windings. Additionally, the Nokia PowerPack could not be used due to inefficiency in charging time. Instead, we are substituting AAA batteries.

The concept of SolexPRO F, which relied on fluids to generate electricity, has been abandoned due to faulty parts from the supplier. It would have taken approximately one month to reorder new parts therefore POWER WALKER has decided to focus solely on the SolexPRO E, which utilizes induction to create electricity.

### **Conclusion**

POWER WALKER is committed to creating an effective solution to provide renewable and portable source of energy. Our team is excited to develop the “SolexPRO”, a revolutionary pair of shoes that generate sustainable energy by walking and running.

The project is currently on track; all parts were received on time and the testing and implementation is currently being carried out. We do have some funds remaining from the original funding by the Engineering Science Student Endowment Fund (ESSEF). However, in case there is an urgent need, the team members will make the necessary contributions and will apply for reimbursements from the Wighton Fund afterwards.