

Lessons Learned for team P12401: Wind Energy Collection to Energy Bank

- Check purchased parts for dimensions and compatibility prior to production. Parts should have been checked once they arrived to ensure they met our specifications. This would have saved time for when parts needed to be re-ordered.
- Improve testing procedures and have more developed backup plans. The team wanted to thoroughly test the turbine in an outside environment. Due to weather constraints, outside testing was limited. Backup test plans were limited in their ability accurately model system performance in an outside environment.
 - If additional funds were acquired for the project, or if another facility worked in coordination with RIT, testing wind turbine in wind turbine would have been feasible. This would have allowed for thorough testing of the wind turbine, which would have accurately represented the system performance in the real world.
 - Devise testing plan to test full capacity of the system's electrical components. There were electrical parts such as relays that we were not able to test since they would perform at the upper echelon of their performance limits.
- Set up preliminary meetings with outside clients/customers/suppliers early in design phase. There was potential to work with a sodium-ion battery supplier (Aquion) in the project through a recent RIT grad. This would have allowed the group to explore cutting edge battery technology while reducing project costs.
- Customer communication on weekly basis during design phase was extremely helpful. It is recommended that future groups get involved with the customer as early as possible so they can benefit from the customer feedback.
- Classes and formal training through RIT proved to be insufficient for some project requirements. A lot of the mechanical and electrical drawing packages required were things which our team was never exposed to before in class.
 - Mechanical Engineering Suggestions: Pair the Machining Lab with the Engineering Design Graphics course.
 - Complete a drawing during the EDG course in the beginning of a week and then make the part during the lab later in the week. That way, students can realize that if they dimension a part a certain way, it will be easier to make, and they will not have to do complex math while a mill is spinning to figure out a dimension.
 - Electrical Engineering Suggestions: It has been said by one of our EE's that no formal documentation practices have been taught for PCB or PCBA drawings. Some main topics that had to be self-taught were...
 - Learning the appropriate CAD tool (EAGLE CAD) which was never used before MSD.
 - PCB layout techniques, using bypass capacitors to filter noise, pin 1 indicators, proper silkscreens or component annotations.
 - PCBA soldering techniques; techniques for soldering surface mounted and through-hole components, and the tools needed
 - PCB ordering process (GERBER files) and how to get best deals for making PCB