Senior Design Project Description

Company Name	IEEE/UNC Charlotte ECE Department	Date Submitted	11/30/2017
Project Title	IEEE Disaster Relief Energy and Communications Enclosures (UNCC_DISAS)	Planned Starting Semester	Spring 2018

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person.

Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	
Computer		Systems	
Other ( )			

Project Overview:

Whenever a natural disaster strikes, IEEE members have wanted to help. To address this commitment to serve humanity, IEEE designed and built a mobile disaster relief vehicle committed to assisting victims of natural disasters. This unit provides short-term communications, computer, and power solutions. While it has performed admirably during natural disasters, it is too large and too expensive to deploy in hundreds of locations worldwide. Many IEEE volunteers have requested a smaller, perhaps even highly portable, version of the vehicle. This "Modular MOVE" model has the benefit of being replicated hundreds of times for deployment by hundreds of IEEE Sections around the world. This project will be to design and build these disaster relief devices. A modular approach fits the needs for different disaster events in different parts of the world, for example, Caribbean hurricanes, Indian floods, or California earthquakes. IEEE Sections can store these subsystems locally, and then deploy them quickly when needed.

Project Requirements:

We determined the primary requirements of the Modular MOVE devices as:

Req. 1. The components of Modular MOVE will be separated into individual modules.
Req. 2. Modules will have the ability to work independently of each other.
Req. 3. All modules shall be pre-configured for faster startup and easier operation.
Req. 4. The Modules should be built to allow them to work in different parts of the world.
Req. 5. The Modules shall be built with off-the-shelf subsystems where possible.
Req. 6. Modular MOVE shall not design a power generation source (i.e. gas generator), but shall instead identify the specifications of such devices.

Req. 7.   Modular MOVE shall have the capability to store electrical power for deployment when power generation is not readily available.
Req. 8.   Modular MOVE shall utilize renewable energy as a secondary power source.
Req. 9.   Modular MOVE shall provide two-way internet access at the location it is deployed.
Req. 10. Modular MOVE shall have the ability to charge up to twenty devices (phones/tablets).

The main Modules that are desired are:
1. Power Generation via fossil fuels (generator) (specified only)
2. Power Storage and Solar Panel
3. Phone/Tablet Charging
4. Wireless Network Communications
5. Satellite Communications

Enclosures (perhaps the same form factor) for Modules 2 through 5 need to be designed.
It should be noted that Modules 2 through 5 can be plugged into the generator or they can be plugged into a normal wall socket, if normally generated power is available. Modules 3 through 5 can be plugged into Module 2.

Expected Deliverables/Results:

- Design documentation of enclosures.
- Completely populated enclosures/modules for phone charging, energy storage, and.

Disposition of Deliverables at the End of the Project:

Built enclosures and devices will be deployed by the IEEE MOVE Disaster Relief Vehicle.

List here any specific skills, requirements, knowledge needed or suggested (If none please state none):
- Structure design, stress analysis, and thermal analysis of enclosures.
- System Integration