Risk Assessment
Safety Plan

I. Project information:

Team 9: Development of Power Converting Subsystem of Kite Powered Generator	1/20/2017
Name of Project	Date of submission

Team Member	Phone Number	e-mail
Andrew Colangelo	954-871-8490	Ajc13g@my.fsu.edu
Zachary Ezzo	813-545-6491	Zre12@my.fsu.edu
Matthew Hedine	813-777-2245	Mch13b@my.fsu.edu
Denitsa Kurteva	954-907-9694	Dk13b@my.fsu.edu

Faculty mentor	Phone Number	e-mail
Dr. Taira	850-645-0140	ktaira@fsu.edu

II. Project description:

The goal of this project to is design, build, and test the power converting subsystem of a kite powered generator. This will be done using a series of concentric springs, a magnet, and an electrical coil. The magnet will be housed inside of the concentric springs and the electrical coil will wrap around the spring/magnet assembly. The ends of the electrical coil will be hooked up to either batteries that will later be used to power to 40W lightbulb, or directly to the 40W lightbulb. The magnet will be forced through the electric coil which will be driven by some mechanical force. When the springs are compressed, the magnet will be forced back through the coil. This process will be repeated over and over until the mechanical force is exhausted, or the batteries are fully charged. A concept design for a 100kW kite powered generator must also be presented. The concept design will include the flight Dynamics of the kite and necessary performance characteristics that are needed to achieve 100kW of power.

II. Describe steps from project initiation to completion:

*if driven by person

1.Hook up electrical coils to either a battery or a lightbulb 2. Approach system and stand on either side of the electrical coil housing. 3. Grip t-bar and pull upwards until it becomes too difficult. 4. Allow spring system to pull the magnet back down through the electrical coil. 5. Repeat steps 2 and 3 until exhausted or batteries are fully charged.

*if kite used

1. Hook up electrical coils to either a battery or a lightbulb 2. Ground by attaching to a stationary object. 3. Deploy kite. 4. Alternate angle of attack unless automatically controlled. 5. Retract kite when finished using.

III. Given that many accidents result from an unexpected reaction or event, go back through the steps of the project and imagine what could go wrong to make what seems to be a safe and well-regulated process turn into one that could result in an accident. (See examples)

With such a powerful magnet being used for the demonstration, there is the possibility of crushing a finger without proper caution of using the magnet. There is also the possibility that a force is exerted on the demonstration that is higher than the safety mechanism and could damage the user or machine. During the demonstration, the tether that is used to pull the magnet through The coil could snap and pose a risk of injury for the user. If the leads are put on backwards on the battery there is the risk of a spark.

IV. Perform online research to identify any accidents that have occurred using your materials, equipment or process. State how you could avoid having this hazardous situation arise in your project.

There have been countless accidents that have occurred in machine shops, to avoid any of these accidents we plan on using the machines under careful caution with supervision at all times. Misuse of a magnet has been documented to wipe phones or computers. To avoid these accidents, we plan to enforce a certain distance that electronics are allowed to be near the magent. There is also the possibility that the model will not be correctly grounded and can lift up off the ground injuring anyone near by.

V. For each identified hazard or "what if" situation noted above, describe one or more measures that will be taken to mitigate the hazard. (See examples of engineering controls, administrative controls, special work practices and PPE).

To avoid any damage to fingers while using the magnet, we plan to use gloves when handling the magnet. To avoid a worn tether from snapping during operation of the model, we plan to routinely check the tether to make sure that there is no wear or tear on The tether. To avoid a spark on the battery, the leads will be color coated to prevent attaching them to the wrong ends.

VI. Rewrite the project steps to include all safety measures taken for each step or combination of steps. Be specific (don't just state "be careful").

1. Hook up electric coils to battery while making sure the battery is off or grounded to avoid any current going through.
2. Approach system while making sure the housing is secure and grounded and stand on either side of the electrical coil housing. User should be wearing pants and close toed shoes.
3. Grip T-bar and pull upwards until it becomes too difficult. User should utilize common sense when exerting an amount of force.
4. User loosens grip to allow spring system to pull magnet back down through electrical coil.
5. Repeat steps 2-3.

VII. Thinking about the accidents that have occurred or that you have identified as a risk, describe emergency response procedures to use.

The accidents that we've discussed are not fatal. In the scenario where an accident occurs depending on the severity of the accident either the team will contact 911 for an emergency or a department representative.

VIII. List emergency response contact information:

- Call 911 for injuries, fires or other emergency situations
- Call your department representative to report a facility concern

Name	Phone Number	Faculty or other COE emergency contact	Phone Number
Dr. Shih	850-410-6321		
Dr. Taira	850-645-0140		

IX. Safety review signatures

- Faculty Review update (required for project changes and as specified by faculty mentor)
- Updated safety reviews should occur for the following reasons:
  1. Faculty requires second review by this date:
  2. Faculty requires discussion and possibly a new safety review BEFORE proceeding with step(s)
  3. An accident or unexpected event has occurred (these must be reported to the faculty, who will decide if a new safety review should be performed.
  4. Changes have been made to the project.

Team Member	Date	Faculty mentor	Date
Andrew Colangelo	1/19/17	Dr. Taira	1/19/17
Zachary Ezzo	1/19/17		
Matthew Hedine	1/19/17		
Denitsa Kurteva	1/19/17		

Report all accidents and near misses to faculty mentor.