**Project Specific Safety Plan**

Team WNR

April 20, 2016

**Project Description:**

Wireless Neural Recorder (WNR) is a wireless monitoring solution to the problem of neural data recording, allowing users the freedom and mobility to return to their normal lives at home while also enabling doctors to obtain sufficient neural data required to treat their patients’ conditions effectively.

**Team Members:**

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**Faculty Advisors:**

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**Technical Experts/Advisors:**

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**Accident Reporting Expectations for OEDK:**

Fill out the incident/accident report within 24 hours of the incident; dial 713-348-6000 immediately when incident occurs.

**In case of emergency***:*

Stop current work immediately by unplugging all devices and equipments. In case of personal injury, call EMS and inform OEDK lab technician at the same time. Report the incident afterwards.

**Hazard Analysis and mitigation plan:**

Electronics:

|  |  |  |
| --- | --- | --- |
| **Work Task** | **Potential Hazards** | **Preventive Actions** |
| Operating with microprocessor boards (especially INTAN RHD 2132 Board) | ESD Hazard | Use ESD Shield and touch metal to discharge possible electron accumulation |
| Operating with oscilloscope for power measurement | Electric Shock | Strictly follow operation instructions, never touch exposed wires and check for short circuit all the time |
| Operating Power supply for power generation | Electric Shock | Strictly follow operation instructions, never touch exposed wires and check for secure connections |
| Operating function generator for generating waveforms | Electric Shock | Strictly follow operation instructions and check for secure connections |
| PCB Mill | Electric Shock, Flying Debris, | Wear safety goggles. Ensure mill safety glass is in place. Do not touch or modify mill components. |
| PCB Components Soldering | Scald Hazard | Wear safety goggles, no eating/drinking |
| PCB Cutting and Filing | Debris Hazard | Wear safety goggles and dust mask, follow safety instructions for PCB cutter and dremel |

In the table above, ESD hazard is the most common and destructive hazard, since it destroys the chipboard in milliseconds, and the entire board will stop functioning, causing a huge economic loss. Special protection is necessary and this headsup must be in mind all the time during operation.

Individual responsible for ensuring that team complies with safety plan:

***Xin Huang: 347-658-6016***

**OEDK safety rules in Electronics:**

* Safety glasses and closed-toe shoes is recommended to be worn when working on electrical/electronic circuits.
* NO EATING/DRINKING while soldering. NO EXCEPTIONS.
* Remove rings, watches, bracelets etc. before working on energized circuits or taking measurements. These items can provide a conductive path for electricity which may result in a shock.
* Voltage and current settings MUST BE verified before applying power to any circuits, circuit boards, motors, etc. Avoid contact with energized electrical circuits or use guarding around exposed circuits and sources of live electricity. (If using electrolytic capacitors, verify the polarity of the leads before installing it into the circuit to avoid possible rupture of the component. Remember that with electric motors torque and current are directly proportional. If full power is applied to a motor at the start up, it will try to accelerate to full speed as quickly as possible.)
* When it is necessary to handle equipment that is plugged in, be sure hands are dry and, when possible, wear nonconductive gloves and shoes with insulated soles.
* Take electrical test measurements using the “one hand” rule. Attaching only one test lead at a time will reduce the risk of receiving an electrical shock.
* Try to avoid making/breaking connections with power applied. (Know how to quickly remove power from a circuit in the event of an emergency, before starting any task. If water or a chemical is spilled onto equipment, shut off power at the main switch or circuit breaker and unplug the equipment.)
* Also, keep in mind if someone is receiving an electrical shock, DO NOT TOUCH THEM. Find a non-conductive material to remove them from the source or remove power from the circuit.

Faculty Safety Reviewer: Gary Woods Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**OEDK general safety rules:**

* YOU MUST follow all safety precautions which are posted, or verbally noted. No exceptions.
* Students are not permitted to work alone at night in the OEDK.
* No smoking is allowed anywhere in the building.
* No food or drinks are allowed in the computer lab or wet lab. It is preferable to have food and drinks in student lounge and definitely NOT at tables where chemicals are used.
* Shoes must be worn at all times.
* Safety glasses and closed-toe shoes must be worn AT ALL TIMES when using any power tools, hand tools, cutting tools, or chemicals including glue.
* If you need help in the OEDK or need to use tools that you do not know how to use, do not hesitate to contact one of the design technicians for help. (When needing assistance from the lab technicians, scheduling a time is suggested; walk up help requests will be handled on an “as available” basis. It is the student's responsible for obtaining proper training for use of the available equipment.)
* If you suspect that a piece of equipment is broken, out of calibration or not functioning properly, let the lab technicians know so that it may be corrected.
* Use proper lifting techniques for heavy objects; bend at your knees not at your waist or ask for assistance. Any object over 75 lbs. is considered a two or more person lift.
* DO NOT stand on rolling stools or chairs. Use a ladder or stepstool for reaching high places or ask for assistance from the OEDK staff.
* Be aware of and follow hazard/warning labels and signs. (The OEDK has many "stored energy devices”. Such as: capacitors, magnets, springs, shock absorbers, servo hydraulic systems, pneumatic systems, batteries and bottled gases, which can be dangerous if not handled properly.
* All Chemicals brought in to OEDK MUST BE checked in and approved by an OEDK technician. We must be able to make Material Safety Data Sheet (MSDS) for chemicals and advise where proper storage is located for item.
* In the case of a battery acid or other chemical spill, the chemical spill kit and instructions can be found in the wet lab and Safety Stations. (You MUST notify an OEDK lab technician or staff member if a spill occurs).

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