Progress Report

By adhering to the milestones that were presented in the functional specification document, GESS Inc. is on schedule on a proof-of-concept model for the iLifeGuard – an underwater communication system designed to assist lifeguards to help swimmers in need on time. Thus, reducing the number of deaths due to drowning. Though minor obstacles were encountered regarding choice of packaging material for the bracelet components, consultation among the team would ensure the development of cheap, reliable and appealing bracelet.

Requirements Analysis

All of the requirements were analysed during the initial and the functional requirement phase. The usability of the transmitter bracelet and the RF receiver were designed in a manner that is comfortable and easy to operate by the users. As we approach the completion of the proof of concept model, further tests shall be done to ensure the proper and accurate working of the components.

System Level Analysis

GESS has completed the various components of the proposed block diagrams in the design and functional specifications. The team was split into two groups to parallelize the tasks and to make sure that the team deadlines were met. The progress of the hardware, software and the integrated systems are described below.

• Hardware Components

The printed circuit boards (PCBs) required for the transmitter, transceiver and the receiver were designed and printed. They are now fully functional with all the required components attached to the boards. The buzzer, sensor and the microphone were all purchased and have been tested and attached to respective PCBs and have been re-tested to ensure proper functioning. The bracelet

design is in progress and is expected to be completed by March 30th. This also involves waterproofing the transmitter PCB and the development is currently in phase with one team of engineers working on conformal coating of the PCB, and the other on the bracelet specifications. The hardware and the software components are described in the sections below:

- ## Software

We used the AVR studio for the software development section of the product. The AVR is a modified Harvard architecture machine with program and data stored in separate physical memory systems that appear in different address spaces, but having the ability to read data items from program memory using special instructions. The software part involves analog to digital conversion of pressure readings, generation of appropriate signals at a specified time and relay of the signals to end of the line receiver. The pressure readings were tested up to a depth of 1 metre below the surface of the pool. The conversion of the pressure readings from analog to digital signals was successful and consistent. Timer function started count upon reception of the first pressure readings and the required signal was sent promptly when timer went off – after 10 seconds as expected. Relay of the signal was also done in time by the microprocessor in the transceiver. As expected, light-emitting diode (LED) connected to the output port of the receiver blinked whenever the signal was received. During the software development, we had to debug the software to optimize its functionality and eliminate unnecessary delays within the signal relays.

Integration

Since the system is composed of three parts, the testing was done to ensure that the parts were coherent with one another. This involved manually keeping track of the time between signal generation, signal relay and signal reception. So far, we included LED in the receiver component held by the lifeguard as a visible sign of signal reception. Though this LED could also serve as a proof of signal generation and relay, we plan to include an indicator in the other two parts of the system. Possible indicators include LEDs and buzzers, chosen depending on whether visibility or production of noise is preferred.

Budget

GESS is financially onboard with the development and testing costs of iLifeguard well within the budget range. We have disbursed approximately $600 from the available funds to purchase components needed to make printed circuit boards for the bracelet, transceiver and the receiver and on the various other associated components. The remainder of the funds shall be used during the testing and waterproofing phase of the project.

Team Dynamics

All the members of team GESS are getting along well as expected. Since all the members have worked with each other in previous labs and projects, we are well informed of the strengths and weaknesses of each member resulting in a healthy group dynamics with random and happy chatter breaking into the serious discussions that occur.

Action Items

April 4th is the final milestone date for the team working on iLifeguard to deliver the proof of concept model. By this deadline the proof of concept model would be thoroughly tested for any loop holes in the system design and specifications. If any discrepancies may arise, they shall be rectified to ensure the proper functioning of the model.