**Project Risk Management**

The ‘Automatic Plant Watering System’ (APWS) takes a basic concept and is integrated with a miniature computer to perform the automated function of plant watering. There are specific risks which are associated with the project, in relation to the methodology and equipment reliability to achieve a successful result.

APWS receives input from multiple sensors to function at regulated intervals to maintain the good health and successful growth of the plants. These sensors must be able to fit in a ‘compact and aesthetically pleasing’ package environment for appeal to customers. This means that any equipment failure may result in degraded system capability to perform its plant watering function. In the most extreme extent is that a single sensor may cause a total systems failure which would render the device as useless.

For the system to persevere and operate, three laws dictate the device functions:

1. Normal (Automatic) Law

2. Alternate Law

3. Manual Law

The Normal Law is for standard operations where the computer determines that all components are fully functional with no degradation in capabilities.

Alternate Law is induced when the system detects degraded functional system failures.

Manual Law is when the user takes full control of the functions.

The device is designed to cope with failures and will degrade to a different state of law. In the instance that the water pump communicates to the computer that it is becoming reliable, the computer will acknowledge and disconnect the pump which will revert to using gravity for the transportation of water from the tank to the plants.  The design of the redundancy is based on a modular system which means each individual part is independent of operating from each other in the event of failure.

The light source suggested for APWS is a hydroponic lighting system. The main risk associated with the device is power failure, which would again render the device useless. The design of the APWS suggests for an auxiliary power unit to be installed onboard the hydroponic light which can supply electricity for up to 15 minutes, while the user troubleshoot the problem until mains electricity is reconnected. The APU is an option for the user to install, which is readily accessible for implementation by using Double AA Batteries.

Overall, the APWS’ functional design floats above the philosophy of simplicity. This minimises the likelihood and possibilities of multiple failures, thus leading to improved reliability and efficiency of functions.