**Chapter One**

**PROJECT SCOPE**

* 1. **Problem Statement**

Design and build an AUV that meets the standards and requirement for the competition with the AUVSI Foundation.

* 1. **Client Identification**

Naval Sea Systems Command: Naval Undersea Warfare Center Keyport Division

**1.3 Goals and Objectives**

Our main goal is to design and build an AUV for competition with the AUVSI Foundation.

**Objectives**

* System must be able to navigate and perform alone along a given course.
* Vehicle must meet certain building parameters and be rescue diver safe.
* Design should be easily modifiable and battery powered.
* Test machine in various conditions and water environments to ensure functionality and durability.
* Waterproofing
* Made with American parts whenever possible and cost effective.
* Team Webpage
* Speed and direction control

|  |  |  |
| --- | --- | --- |
| **Objective** | **Possible Solutions** | **Methods & measurements** |
| Cost | NAVSEA funding/ Sponsorship/School funding | <$10,000 for parts Navsea  Procure Costs for spare and test parts <$2000 |
| Testing | Campus pools and local water locations | PV pool, Salt and fresh water test areas. Depth, speed, time |
| Equipment/building | Purchase and donation.  Modify existing models. | Cameras, batteries etc from online purchases. Pounds, inches. |
| Waterproofing | Gaskets, Water repellant coatings, hulls | Polyurethane coatings, gaskets. |
| Design | Build upon known designs.  Unique vehicle shape. | Current submarines and robotics as well as computer programing. Shaping. Inches, centimeters. |
| Maneuverability | Mechanical and electrical signals | Sychros, gyros, compass, video cameras and software. Speed, pitch, yaw |
| Speed | Jets and thrusters | Position speed devices and use electronic controls. RPM |
| Webpage | Create a domain or modify existing network for access | Unique designed webpage/link, Facebook |

**Table 1.1:** Table of Objectives

* 1. **Contemporary Issues Relevant to Project**

A major contemporary issue that has been identified with the AUV is the navigation in underwater environment. An AUV which is designed to search, locate, identify and record the position of underwater mines requires a very accurate navigation system in order to avoid accidental detonation of the mines.

* 1. **Potential Impact On The Society**

Studies have shown that AUVs could serve as a replacement for conventional ship-bourne hydrographic survey tasks. Also, could be the future for conventional tethered Remotely Operated Vehicle (ROV) tasks.

**1.6 Operating Environment**

Our environment will be in a pool of a known depth and solution. The obstacle course will consist of trials having various shaped PVC piping along a path as well as an emitted frequency. The underwater vehicle will navigate completely submerged with no outside control in less than 20 minutes.

**1.7 Initial Project Constraints**

* Time Constraints
* Resources
* Funding
* Computer Science personnel for software programing
* Equipment availability
* Electromagnetic interference