**UNH SEDS Progress Report**

Development of Student built Hybrid Rocket

Alex Chesley – UNH SEDS Treasurer

7/27/20

**Purpose-**

The purpose of this report is to summarize progress, achievements, and setbacks made by the UNH SEDS during the 2019-2020 academic year. The purpose of the project undertaken by the UNH SEDS is to develop a hybrid rocket system to compete in Spaceport America Cup, a national armature rocket competition.

**Summary-**

UNH SEDS has had its most successful academic term to date. The team has built and tested two separate revisions of a hybrid rocket engine, assembled a complete flight frame, and finished the first design of our launch control system. These achievements will be highlighted through the report with a small detailed report from each subsystem on the rocket.

So far the team has made first revisions of nearly all systems on the rocket. The past academic year has paved a good foundation for further iterations of each sub system on the rocket.

**Discussion-**

* The progress of each system on the rocket will be categorized and summarized below.

Propulsion: Towards the end of the semester, the propulsion team built and tested two different iterations of our hybrid rocket engine. The propulsion team made a steal framed test stand that was used successfully for both our hot and cold fire testing. During our second, and last hot fire of the year, we had inconsistent combustion inside the combustion chamber. This lead to a rupture of the combustion chamber ending in a fire. All components except the combustion chamber survived and will be used in future tests. Currently propulsion progress has been put on hold as we are trying to have a new combustion camber made by the end of the summer.

Frame: The frame team was working towards incorporating all necessary internal components into a rigid lightweight frame that will make up the body of our rocket. At semester end, the frame team had completed and assembled their frame design, along with creating a body for the exterior of the rocket. Work still needs to be done on making a functioning nose cone and payload compartment at the top of the rocket.

Avionics: The Goal of the avionics team was to create a small launch controller in the form of a briefcase, and to set up both a data collection and ignition system for our test stand. The launch controller was nearly fully functional and tested on dummy igniters. Unfortunately the final version was never finished as the university moved to remote learning. The avionics team set up our ignition and oxidizer actuation systems for our test stand which both worked flawlessly.

**Budget Report-**

The gracious donation from the UNH Parents Association was used to go towards the machining costs of our V2 rocket engine. As seen on the invoice below, the money was used to pay for our chamber, nozzle, and injection plate at Seneca Machine.

**A screenshot of a cell phone

Description automatically generated**