

*Notes taken by: Owen Kaufmann*

Overview of new **member project progress**, clarification on design parameters:

- Mass budget is not needing to be optimized.
- Money budget: \$50/each target, without actuator part e.g. solenoid valve.
- Needs to close while fuel is flowing.
- Propellant pressure ~1600PSI
- FOS: 2
- Temp around part/gas temp: should be ambient, however it depends on a few things not discussed in detail.
- Necessary flow rate:  $C_v=13-13.5$
- Propellant flow rates: 0.1651ft<sup>3</sup>/s liquid oxygen, 0.1585ft<sup>3</sup>/s liquid methane.
- Patrick will send out valve actuation torque requirement.

### **Sprint Backlog:**

- Hoping to wind carbon structural testing tubes tonight.
- Bulkhead drawings complete, ready to be manufactured.
- Nozzle strain: target to have analysis done by Monday, Sept 7th.
  - Michael S's FEA: Reveals that the FOS is around 2 in throat section on inner wall. FOS issues on outer wall when applying uniform 1500PSI, however we are unlikely to realize these forces in practice. Also, volute is causing an asymmetrical stress concentration on the throat. Can fix by making the volute flange axially symmetric.
  - Some confusion on what (SS) means in Solidworks material assignment: 6061 T6 (SS)
    - We will be looking into this to properly characterize our parts in FEA.
- CFD (Zach): Looking like more trouble than it's worth. Will keep working on getting the meshing done and try to do a simulation on the film cooling, however we might have to rely on experimental data more heavily in general.
  - Looking into SU2 (Owen), other open-source CFD, it's going to take a dedicated effort and serious time to figure out a sustainable CFD solution for SRL engine simulation.
- Servos for misc valves will need testing. Ian has multiple Arduinos for configuring a test setup. Will likely have 9V power source on rocket, but this has not been finalized.