NAKUJA PROJECT INTERNSHIP

WEEK 10 PROGRESS REPORT

PROPULSION

TASKS ACHIEVED THIS WEEK

- [#32] Test stand PCB Etching
- [#99] Camera mount for test stand
- [#52] Nozzle Fabrication
- [#19] Iterative static firing test.
- [#151] Launch pad design

● [#56] Fuel Casting

We prepared a single grain of fuel. The mixing ratio was 67:33 potassium nitrate to sorbitol, 5g of iron oxide. The single grain was used for a static conducted on Friday.

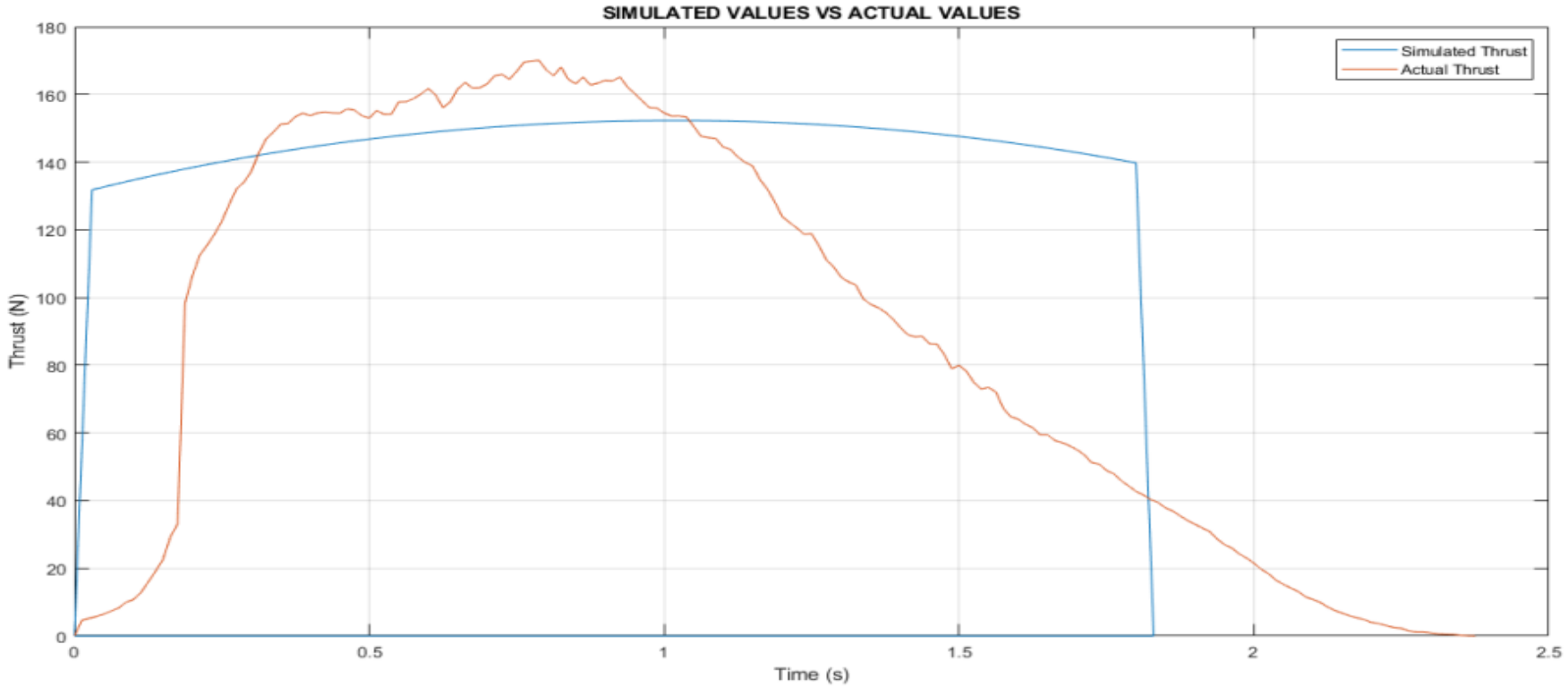
[#24] Static Firing Test #8

We went back to one grain for testing.

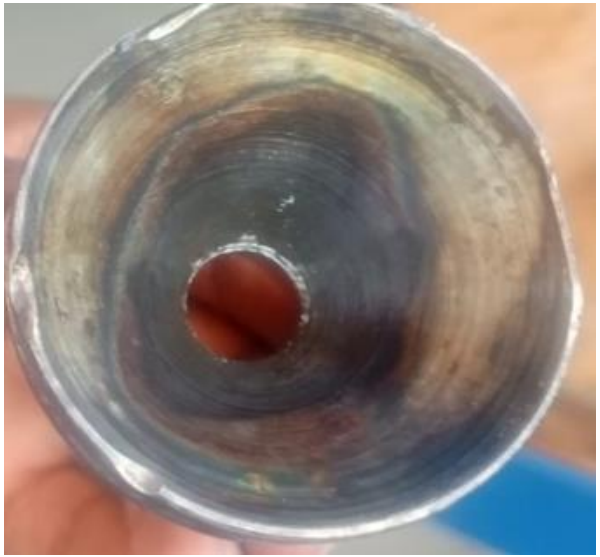
We achieved a maximum thrust of 170N compared to the simulated value of 152.2N.

There was use pressure seal (o-ring) at the nozzle.

Thermal insulation inside the casing was used to protect the casing from high temperatures.



Value	SIMULATED	ACTUAL
Motor Class	H	H
Total Impulse (Ns)	263.74	214
Specific Impulse (s)	879.15	714.3
Average thrust(N)	141.8	80.87
Peak Thrust (N)	152.2	170
Burn Time (s)	1.83	2.375

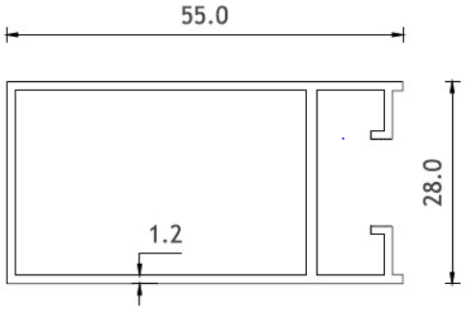


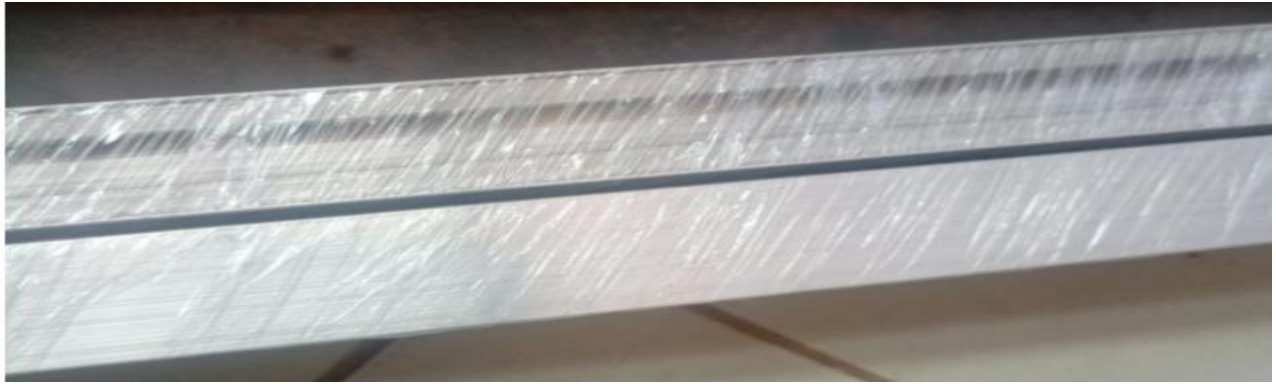
There was no corrosion at the throat of the nozzle indicating the steel nozzle was able to withstand the temperature and pressure.

During machining the nozzle was destroyed necessitating a new fabrication of the nozzle.

Launch Pad Design

Exit Rail Purchase





6m of aluminium s003 was bought to be used as exit rail for the launch pad

[#16] Test stand revamp (Repairing)

As noted previously, the test-stand was improved by adding a mesh around it to increase safety.

TASKS TO BE DONE

- [#71] Casing Fabrication
- [#19] Iterative static firing test.
- [#151] Launch pad fabrication
- [#150] Test Flight

Timeline

Month	Intern week	Tasks
Jan		
	Week 1	Designs [Fuel, Casing, Nozzle, Bulkhead, Casting tools, Test stand]
	Week 2	Fabrication of items
	Week 3	Fuel Fabrication and test stand revamp
Feb	Week 4	Fabrication of items & Fuel casting
	Week 5	Iterative Fuel tests
	Week 6	Launch Pad design and iterative fuel tests
	Week 7	Iterative fuel testing and improvement