Sebastian Wigstrom

Joshua Denali Benner

Hao Yi Ong

Michal Wegrzynski

ME 140

Advanced Thermal Systems

Reginald Mitchell

April 16, 2014

**Project #3: SR30 Turbojet Combustion Report**

1)

Resubmit all plots from last week with your new combustion product calculations.

Plot of turbine power output using the three scenarios described (constant cp air, variable cp air, variable cp combustion products)

2)

Report your calculated value of the enthalpy of formation for Jet A

A plot of adiabatic flame temperature for both Jet A/air and Dodecane/air over a range of equivalence ratios

3)

Calculate the turbine power assuming To4 is the adiabatic flame temperature and To5 is the isentropic value. (Back to the SR-30 here, so use your measured values) Add this power to your compressor//turbine power plot.

Add the new To4 and To5s to your temperature plot.

4)

This is more open ended, but please provide us with at least 3-4 well thought-out and supported suggestions for improvement. Be as quantitative as possible, and include figures/equations where appropriate. The writeup says a "concise report", so please keep it between 2 and 3 pages (figures included).

4) Critical analysis: how good is it as an engine? Does it accomplish its purpose? Mention profile factor and pattern factor

Ways that the SR30 can be improved:

Reduce the area ratio of the nozzle to increase thrust.

Raise the combustor efficiency by increasing the number of fuel atomizers

Increase the compression ratio