COMPUTATIONAL ANALYSIS OF THRUSTER NOZZLE

SYED DANIEL SHUKRI BIN SYED MOHD TAHIR
(2006134949)

"A thesis submitted in partial fulfillment of the requirement for award of Bachelor of Engineering (Honors) (Mechanical)"

Faculty of Mechanical Engineering
Universiti Technologi MARA (UiTM)

NOVEMBER 2009

"I declared that this thesis is result of my own work except the ideas and summaries which I have clarified their sources. This thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree"

Signature : ....

Date : 26ᵗʰ NOVEMBER 09

SYED DANIEL SHUKRI BIN SYED MOHD TAHIR

UiTM No: 2006134949

ACKNOWLEDGEMENT

In the name of Allah S.W.T, The most gracious which given me the strength and the guidance that I need to complete this thesis. With the one and only Allah S.W.T as my guidance it is carried out smoothly.

I would also like to take this chance to thank my supervisor which is also my mentor and supervisor Mr. Ahmad Hussein Bin Adbul Hamid for putting his trust on me to handle this task and for all the knowledge that he conveyed on to me.

Here also I would like to give the highest gratitude to all my family members, teachers and lecturers, friends and everybody that made it possible for me to attain the knowledge and will to complete this research thesis. Also I would like to thanks various intellectual personnel, institution and companies that also aid in the completion of this thesis

Finally thanks also to whom that is so many to mention that give their undying support and assistants to me in completing this thesis in form of idea, knowledge and effort either directly or otherwise.

ABSTRACT

Aviation and Space travel has become more important, demand need to be met with better technology via in depth research on the matter, thruster is propulsive device used by aircraft and spacecraft for altitude control. Thrust force is generated by combustion of propellant which is the fuel and oxidizer within the thrust chamber, that turn the combustion effect to thrust force that accelerated and ejected at high velocity through a nozzle thereby imparting momentum to the system. There are several distinctive variables that determined the efficiency of the thruster nozzle, one of the most important and effective method to do so is by possessing the most superior nozzle configuration. Research is done to studies the effect of variable changes in nozzle design to thruster nozzle parameter, they are subjected to the same flow condition while applying constrain of flight simulation on a sea level altitude. Six different geometry of nozzle divergence section which varies in angle and length, would be studied based on the criteria set under the studies constraint. These studies could aid us by ensuring better understanding of flow characteristic in nozzle studies with emphasize on nozzle configuration by providing comprehensive research information and visualization interpretation via simulation. Also, it is with great expectation that the nation would be interested in further aviation studies where this research could be the basic guideline of thruster design.

TABLE OF CONTENTS