

I. IDENTIFICATION DATA

Thesis name:	Study of launcher recovery systems
Author's name:	Mauro Eusebio Rojas Sigala
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Control Engineering
Thesis supervisor:	Dr. Élcio Jeronimo de Oliveira
Supervisor's department:	doc. Kristian Hengster-Movric, Ph.D.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
This thesis deals with the analysis and proposal of a stage recovery system for small launchers. This problem presents a high level of difficulty that demands a multidisciplinary capability in space systems. For instance, only few years ago it was demonstrated a cost effective project by the company Space X. In this way, a complete solution of this problem is out of the range of a unique master thesis. However, a general analysis with a reasonable approximation can take place in a master thesis as done by the author.	

Satisfaction of assignment	fulfilled with minor objections
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
A control project, even a simple one, for the reentry stage is not developed in this thesis, being left for a future research. A good control project will impact in the final sizing and payload capability of the launcher, as well as in the final cost of this sort of project. However, considering the short time to develop this master thesis, it should be taken into account the relative complexity of this topic which demands time to be developed properly.	

Activity and independence when creating final thesis	A - excellent.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
After some meetings receiving the general background to guide his research, the student worked independently by developing his own computational codes, as well as the whole research by analyzing and comparing the theory and data available in the current literature.	

Technical level	A - excellent.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
As addressed before, to develop this specific topic demands a very good understanding and application of a multitude of skills in the space area, as well as time. In the specific case of this thesis, considering the short time, the work covered most of the key areas demanded to achieve an acceptable preliminary design/result.	

Formal and language level, scope of thesis	B - very good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
In general, the thesis is well structured and written in a clear and sequential way, which make easy its understanding. The theoretical/mathematical development, references and codes used are clear and follow the formal scientific language. However, a review/correction in some graphics need to be done.	

Selection of sources, citation correctness	B - very good.
<i>Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished</i>	



SUPERVISOR'S OPINION OF FINAL THESIS

from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

During the regular meetings to follow up the thesis progress, it was clear the use of good references and the care, by the student, with the use of some "not well informed" parameter. However, in the Reference List a publication appears twice with different heading.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

Please insert your commentary (voluntary evaluation).

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

I evaluate handed thesis with classification grade **B - very good**.

Date: **30.8.2020**

Signature: