MECHANICAL ENGINEERING STUDY PROGRAM
FACULTY OF MECHANICAL AND AEROSPACE ENGINEERING
BANDUNG INSTITUTE OF TECHNOLOGY
Labtek II 2nd Floor, Ganesha 10, Bandung 40132, Phone: +6222 2504243, Fax: +6222 2534099
Email: tu@ftmd.itb.ac.id, Website: www.ftmd.itb.ac.id

Review of the Master Thesis CTU-ITB

Reviewer:

Dr Ir Prihadi Setyo Darmanto
Associate Professor at Faculty of Mechanical and Aerospace Engineering
Bandung Institute of Technology, Bandung, Indonesia

Title of the Thesis:

MASS FLOW LEAKAGE IN LABYRINTH SEAL

Prepared by:

Zbysek Ryvola, Master Student of Czech Technical University and Bandung Institute of Technology.

Introduction:

Before I have taken the responsibility to give some comments of the work and thesis of Mr. Zbysek Ryvola, I know him since he attended my Air Conditioning System course and he got very good score. By reading his thesis report, I am sure that Mr. Zbysek Ryvola is a good, curious, motivated and hard working student.

Review:

The main topic of this master thesis is concerning the evaluation of mass leakage, especially steam, through a labyrinth seal. The methodology of evaluation is based on the formulation derived by some researcher as well as numerical computational fluid dynamics (CFD) using three types of turbulent models. Finally the comparison of the results for various pressure ratio between the evaluation using empirical formulation and CFD was also conducted. The lowest different results between empirical formulation and CFD is finally proposed as the most accurate results for the case study of three teeth labyrinth with steam as working fluid. The main objective of the research is to verify the accuracy of the empirical relationships in comparison to the evaluation using CFD method, as well as it should provide suggestions to the designers in terms of sufficient mesh quality and what turbulent model is better to use for CFD simulations in similar applications. The results show that the empiric correlation of Samoylovich and Kearton is the closest to the evaluation results based on CFD simulation with k-ε turbulent model. In conclusion, the research questions on the suggestion on which formulation that could be used by the designer for calculating steam leakage through the labyrinth can be answered systematically by the results of study. However this results are expected could be able to be compared with experimental results.

Conclusion:

As the whole conclusion, it is reasonable to say that this thesis work is a very good and interesting research work and report.

Question:

In general application, in order to reduce steam leakage, what do you think about the relation of the number of teeth with the increasing of pressure ratio. Is it higher with the higher pressure ratio or contrary the number of teeth is lower with the increase of pressure ratio? Could you explain the reason?

Mark: Very good

Bandung, 8 February 2017 ***Signature of the reviewer***