THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**CFD MODELLING AND SIMULATION OF A CENTRIFUGAL FAN**
Author's name:	**TAO JIANG**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Environmental Engineering
Thesis reviewer:	Ing. Ondřej Hojer, Ph.D.
Reviewer's department:	extern

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **challenging**

How demanding was the assigned project?

The project was challenging by its complexity and also by the time demand. It was first necessary to adapt the given geometry, perform high quality 3D meshing and preliminary simulations which were needed to test some settings and to use the results of y+ further as the final input settings. At the end it was necessary to perform simulations for 5 different boundary conditions and analyze the results.

Fulfilment of assignment **fulfilled with minor objections**

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

The primary task to perform the simulations using the given method and make the comparison with measurements was fulfilled. However there are important objections. The first objection is a complete absence of any critical review. Such an assignment with a lot of necessary settings and inputs needs either big experience which for sure one cannot expect from a student or high quality review but this was not done. The only references are located at the end of the thesis in a literature part but these few references are mainly not cited in the text. There are also other problems. At the end it was found that in some region the validation fails but the analysis of this problem is very flat with just a few arguments. It is not always possible to find the error in limited time but I missed here more ideas about what could be wrong. Generally, critical analysis of the results and presented figures is not well done. In the final validation graph, which should be the most important part of the thesis, there are also fundamental errors. One cannot connect measured or simulated data by a line, if there is no clear mathematical description of the curve. Moreover, the choice of chart style (data points with smooth line) is wrong. There are no error bars on the graph which might be caused by missing data from the fan manufacturer but at least it could have been mentioned that these data were not available. Also, the number of decimal points in the values on both axes is not appropriate.

Methodology **partially applicable**

Comment on the correctness of the approach and/or the solution methods.

There is absent a critical review of literature at the beginning which devalues all the other chosen steps although they could be appropriate and correct. A critical review of the state of the art could have revealed that similar cases have been already solved and published, so some previous experience could have been used for the current work.

Technical level **D - satisfactory.**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

The work was presented clearly and all the steps were explained sufficiently with minor exceptions only. Unfortunately, a deeper analysis or at least the student's own opinion about the results is missing, perhaps due to a lack of theoretical knowledge or maybe because of insufficient language skills. This is a bit strange as the knowledge necessary to perform such simulations must have been very broad.

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Formal and language level, scope of thesis	**D - satisfactory.**
Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?	
There are some language mistakes but generally the text is understandable and clear. There are also some formal faults like missing dots at the end of the sentences, different text formats in one sentence, mistyping, some pictures not well chosen, not well written decimal points, etc. All these errors indicate that student was not concentrated enough during the thesis writing-up.	

Selection of sources, citation correctness	**E - sufficient.**
Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?	
Some sources in the Literature part were found and chosen correctly but unfortunately, they were not cited (not used) in the thesis text. Critical review part is missing totally. Moreover, the writing style of some of these references doesn't follow the valid standards so sometimes it is difficult to find the source of information. Correct citations are very important in the scientific work.	

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

Although the set goal of the thesis was finally fulfilled and some results were obtained and presented, the overall quality of all the steps is not very good. There are errors in methodology, citations, graphs and also formal level of the thesis is not high. I mostly miss the student's own critical view with a broader and deeper discussion of achieved results.

I have two questions:

1) Can you present velocity vectors in the area **between the blades** for one chosen gauge pressure? Please show one vector plot at the region with the highest velocities and another plot on the opposite site. Can you comment what is happening between the blades when they are rotating?
2) Can you compare the maximum velocity of the air behind the blade with the circumferential velocity of the blade tip?

The grade that I suggest for the thesis is **D - satisfactory.**

Date: **16.8.2021** Signature: