THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Design of a braking resistor for methane environment**
Author's name:	**Ilya Davydov**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of instrumentation and control engineering
Thesis reviewer:	Ing. Zdeněk Novák, Ph.D.
Reviewer's department:	Department of instrumentation and control engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment — **ordinarily challenging**

How demanding was the assigned project?

The work is challenging enough

Fulfilment of assignment — **fulfilled**

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 assignment has been fulfilled

Methodology — **outstanding**

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

The chosen methodology is correct

Technical level — **A - excellent.**

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?

Technical level of the bachelor thesis is at a high level. The student used 20 publications to write the thesis.

Formal and language level, scope of thesis — **B - very good.**

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 minor errors and formal deficiencies in the work. Formal editing would have deserved more attention when writing the thesis, for example, double labelling of Figure 1 or the beginning of subchapters at the end of the page, etc. There is unnecessary duplication of the same symbols in the thesis - the symbol v (Latin form) is used for both velocity and kinematic viscosity, this can be distinguished using the Greek letters v (Nu). For the velocity of the water flow, w is used interchangeably, which should be represented in equation (6) where the author mistakenly uses v. The area is used as S but also as A, here it would be more useful if the symbols were unified.

Selection of sources, citation correctness — **B - very good.**

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?

The student has used a sufficient number of publications to solve a specific problem. The student could have focused more on the symbology for this work as different publications use different terminology.

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.

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

In this thesis, the student designs a resistor for a traction locomotive. At the beginning, he introduced the reader to the function of locomotives and their historical development and the function of electric and diesel-electric locomotives to understand the implications of using a resistor.

The design of the resistors themselves is explained in a chronological logic and uses coupled problems of electric, temperature and flow fields.

The bachelor thesis is of a high standard, which is brought down by some formal shortcomings, which are described in the section Formal and language level, scope of the thesis.

I have the following questions about the thesis:

1. *The proposed locomotive will have traction batteries from which the motors will be powered. You state in your paper that the energy during braking is regenerated in the batteries, but still the resistor you propose must be installed in the locomotive. Why?*
2. *You do not use the derivative term dT/dt in equation (6). Why can you neglect it for this problem?*
3. *Chapters 2.4 and 4.3 distinguish and select sensors for temperature measurement. You indicate that sensors with lower sensitivity are insufficient (e.g. 5°C). Can you explain why sensor sensitivity is an important factor in this design?*

The grade that I award for the thesis is **B - very good.**

Date: **22.6.2022** Signature: