



SUPERVISOR'S REPORT ON THE MASTER'S THESIS

Master's thesis title **Modernization of a traction system for metro vehicles**

Author **Kenzo SIMOND**

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Evaluation criteria and their classification

Fulfilment of the thesis requirements and goals..... C (good)

Self-action and own initiative during the thesis elaboration..... B (very good)

Application of knowledge gained

by self-study and from professional literature C (good)

Usage of groundwork and data from practice A (excellent)

Professional level and contribution of the thesis C (good)

Formal aspects of the thesis D (satisfactory)

Further comments to the thesis:

The thesis was done during the author's internship in Lyon metro operator - Keolis Lyon. It is based on the current situation and needs of this company, however the main conclusions of the thesis are generally applicable. A fleet modernization and renewal is a key issue for all operators of railway vehicles. The thesis summarizes benefits of replacement of DC traction system for MLP 75 metro vehicle by AC traction system. Both traction systems are compared in technical, operational and economic terms. The thesis contains a lot of information and is based on the experience that the author gained during his internship.

Fulfilment of the thesis requirements and goals

The thesis fulfils all points of assignment, although often stays on the surface of a problem. A typical example shows chapter 12. Installation in the Current Bogie (page 40), which contains a list of tasks that should be done in order to assembly the new traction chain into the MLP 75 vehicle. It contains sentences like "..we must make sure" or "..we

must check", Unfortunately it is all. I would expect that these tasks will be addressed at the thesis.

Self action and own initiative...

The thesis was done mainly on the supervision of the tutor from Keolis Lyon. The author informed me regularly about his progress.

Application of knowledge & Usage of groundwork and data from practice

In the thesis mainly the materials and software tools provided by Keolis Lyon are applied. The author very well utilized his knowledge and information gained during the internship, however the thesis often only summarizes these information without deeper analysis.

Professional level and contribution of the thesis

In the thesis the author well utilizes the knowledge and facilities of Keolis Lyon. The thesis confirm advantages of asynchronous traction systems for metro vehicles and shows that MLP75/NG could be used in Metro Lyon line A with financial benefit around 1 million Euro until 2035. The thesis focuses on the energy consumption, vehicle reconstruction and maintenance and its costs. Technical issues connected with the replacement of a traction system are addressed marginally. The review of DC and AC motors is very general and contains several inaccuracies.

Formal aspects of the thesis

The thesis does not contain a list of variables and their designations. Consequently many equations contain words or general designations of quantities. Therefore it is not always clear what input values were used for the calculations. The thesis contain a lot of tables, however not all figures displayed in the tables are necessary for further calculations and simulations. Especially for displaying the simulation results it would be better to use some kind of graph instead of tables. The key calculations and simulations were performed using some very weakly specified in-house software of Keolis Lyon. It is not clear what inputs are taken into the account and how. Most of the references in the reference list are not fully specified and do not respect citation rules.

Questions:

Simultaneously with the change of the traction system, a change of the vehicle arrangement is also proposed. The unit is changed from a three car unit to four car unit. Why?

I **recommend** the master's thesis for the defence.

Summary classification of the master's thesis C (good)

Ing. Jan Kalivoda, Ph.D.

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supervisor's name

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supervisor's signature

In Prague 7th of September 2017