

## Master thesis reviewers opinion

**Title:**

**EXAMINATION OF ELECTRICAL ENERGY QUALITY OF GAS CONDENSATE FIELD**

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**Opponents name: Ing. Jan Bejbl, Ph.D.**

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The goal of the thesis is to assess the quality of electric energy of the gas condensate field and propose measures to improve it.

First of all the student describes in the technical part of the thesis the parameters of electrical energy quality. After evaluation of steady-state voltage deviation, negative sequence voltage unbalance factor and zero sequence voltage unbalance factor including the analysis of losses of power and electrical energy she concluded two problems - the necessity of reactive power compensation and the high value of the negative sequence voltage unbalance factor.

After analysis of measures for improving electrical energy quality the student propose investment in the capacitor unit with harmonic filters and investment in one of the selection of new high-voltage circuit breakers.

In the next part there is the economical evaluation of proposed investments including the sensitivity analysis.

The overall approach of the student can be assessed as comprehensive. The technical part is quite robust. The thesis has a logical sequence and the economical evaluation including sensitivity analysis can be considered as a sufficient.

The obtained results, their contribution and their practical application I consider as a sufficient as well.

However, I would appreciate some more conclusions at the end of the technical and economical part.

I miss in the thesis some more discussions about used inflation rate (whether it is not clear if CPI or PPI was used) and about the discount rate, which is relatively little commented.

I also don't understand the calculation of savings of the cost of overhaul – 60 % of 6 000 000 RUB is 3 000 000 RUB? With regard to that, this parameter is the most affecting the economical evaluation I think it should be little more discussed.

Despite of the mentioned above, I consider the quality of the thesis to be sufficient.

From the formal point of view, the work meets the given requirements.

I suggest the classification

**A – excellent**

and I recommend the work for defence.

I have the following questions:

1. How would change the results of economical evaluation if you would consider that the overhaul of synchronous motor would be carried out every two years (instead of three)?
2. You assumed that the investment will be covered from the equity. In this particular case with such robust payback period it's not surprising. Could you generally describe what should be included in the economical evaluation assuming financing via bank loan? How would it affect the results of IRR criterium?

In Prague on 9. 6. 2022

Ing. Jan Bejbl, Ph.D.