



OPPONENT'S EVALUATION OF THE DIPLOMA THESIS

Student: VITALII SOLOVIOV

Opponent: Assoc. Prof. Ing. Jiří Hirš, CSc.

Study program: **Engineering Informatics**

Study discipline: **Integrated Systems in Buildings**

Academic year: **2014/2015**

Thesis topic: **Integrated Systems in Buildings - HVAC in an office building**

Evaluation of the thesis:

▪ The thoroughness of the elaboration, its validity and the difficulties resolved in the thesis

Scope of this Thesis is designing an integrated technical system for an office building, with the focus on energy savings and provision of comfort for inhabitants. Thesis presents a study on the perspectives of old buildings renovation in Moldova, according to modern approaches on energy efficiency and building management systems.

Student applied measures to meet the requirements for low energy consumption in an old building in Moldova. He designed HVAC systems, hot water preparation and lighting systems. He proposed intelligent building operation principles, implemented through KNX control and SCADA visualization. Economy evaluation is also included. Elaboration is complete, solved the current task and the difficulty is slightly above average.

▪ The method and level of the concepts resolved in the thesis

Master student used for processing the theoretical part of the appropriate literature, research are an adequate extent, concrete knowledge applied to the old office building.

▪ The level of the student's thesis topic and elaboration and its contribution(s)

The level of the topic is moderately difficult. I see the benefit of diploma student in very good overview of the theory and application of appropriate solutions to concrete office building.

▪ The formal aspects of the thesis, errors and mistakes in the technical aspects

- Page 15, Fig. 2. Comparison of gas prices between EaP countries. **What unit is used for price of gas (EUR/1000m²)?**
- Page 24, Chapter 2.2 c) Intelligent building design: Automatic reduction of air temperature after working hours. **Should be controlled whole process, not only reduction after working hours.**
- Page 25, chapter 2.3. **What is including to energy limit over 200 kWh/m²per year? Is it only energy for heating and cooling?** Page 32, Tab. 4. Sound level requirements of national standards. **Is the admissible sound level A [dB] valid for 24 hours of day?**
- Page 90, Last sentence of chapter 9.5: "Total required heat power of the building is 79.47 kW. Heating system shall be designed according to that value." **What is include in value 79,47 kW? Heating system produce the heat for heating, domestic hot water, air conditioning and technologies.**
- Scheme page 94, fig. 34:
 - Unreadable description
 - **Where are the safety valves?**
 - **How to change the circulation pump B10 and what is the type of liquid in solar circuit?**

- **How to change the circulation pump B10 and what is the type of liquid in solar circuit?**
- End of page 95: “Installed heat power is taken with a 10% – 20% reserve toward total heat load.”
Why do you design the reserve 10-20%? Who will pay this oversizing of radiators?
- In Fig. 36 is missing the description of radiators.

▪ Questions relating to the defence of the thesis

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- **Does the Moldova deal with Nearly Zero-energy buildings according the EU directive?**
- **How lighting affects the orientation of the building and the type of glazing?**
- **What type of shading will meet the requirements for intelligent lighting control?**

▪ Conclusion, evaluation of the overall qualities of the submitted thesis and classification according to the rating scale

The work is very good. The application made on concrete building demonstrates the ability of diploma students mastering the subject. At work are some inaccuracies and incorrect technical terms. Work fulfils the requirements for a university qualifying work and I recommend it for defence.

Overall evaluation of the thesis:

The Opponent shall grant a mark according to the ECTS classification scale:

A – Excellent, B – Very Good, C – Good, D – Satisfactory, E – Sufficient, F – Insufficient

An “F” grade also means "I do not recommend the thesis for defence."

I recommend this thesis to be defended and suggest the following evaluation:

B - Very Good

In the case of an evaluation grade of “F – Insufficient”, please supply the main shortages and reasons for this assessment.

4.9.2015

Date: 4.9.2015

Thesis Opponent's Signature:

