

## POSUDEK OPONENTA DIPLOMOVÉ PRÁCE

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**Oponent:** doc. Ing. Jiří Hirš, CSc.

Studijní program: **Inženýrská informatika**

Studijní obor: **Integrované systémy v budovách**

Akademický rok: **2014/2015**

Téma diplomové práce: **Integrated System HVAC in Family House**

### Hodnocení práce:

- The diploma thesis deal with study solutions for nearly zero energy buildings in terms of building physics, energy consumption, the creation of microclimate, lighting, acoustic problems and possibilities of using renewable energy sources. Based on the analysis, student describes the requirements for environmental engineering equipment, the lighting including the management, monitoring and communication. Student for family house made the design the appropriate system of technical engineering with the possibility of using renewable energy sources. The heating system use the heat pump with the possibility of cooling the interior. For domestic hot water are used solar thermic panels. At the end of thesis is presented visualization SCADA and possibility of using PV solar panels with the technical and economic evaluation.  
The thesis deals with the actual topic of moderate difficulty.
- Student compiled a brief overview of the current state of theoretical and applied on a specific building their knowledge with some mistakes.
- The level of elaboration of the theme is average. Contribution diploma students see in the design of systems using renewable energy sources. The building has not been evaluated in terms of the requirement to nZEB.
- This thesis has a moderate level of graphics and meets the requirements for a university qualification work.
- Some mistakes:
  - Ranking of energy efficiency buildings presented at first chapter not correspond with actual legislative documents. In EU and also in Czech law is only the nZEB defined.
  - How do you create the fig. 1 and fig. 7?
  - What is the „m“ in equation No.2?
  - What is the unit of numbers in tab.5?
  - P. 73 – on figure 15 is energy performance certificate of building envelope. Is not possible to classify the building according this certificate. You should calculate energy certificate of building according Directive 31/2010/EC (figure 3.)
  - Chapter 6.3 – Photovoltaics are not solar collectors?
  - In tab. 23 is better use pipe length instead duct length.



- Questions:
  - Which type of air humidity is described in chapter 3.2 (absolute, specific, relative)?
  - What is the enthalpy of humid air? Is it also the parameter of external climate conditions?
  - When the bivalent electric boiler in heat pump will be operate according the fig. 17.?
  - Why do you compare the surface temperature in equation No.47 with 29 °C?
  
- This diploma thesis deals with the actual technical design of thermal systems for family house with the use of renewable energy, which leads to the nearly zero energy building's design. Thesis with smaller errors fulfilled task and I recommend it for defence.

**Celkové hodnocení práce:**

Známku uvede oponent dle svého uvážení dle klasifikační stupnice ECTS:

A – výborně, B – velmi dobře, C – dobře, D – uspokojivě, E – dostatečně, F – nedostatečně.

Stupeň F znamená též „nedoporučuji práci k obhajobě“.

**Předloženou diplomovou práci doporučuji k obhajobě a navrhuji hodnocení**

**C - dobře.**

**V případě hodnocení stupněm „F – nedostatečně“ uveďte do připomínek a slovního vyjádření hlavní nedostatky práce a důvody tohoto hodnocení.**

Datum 23.5.2015

Podpis oponenta diplomové práce