CZECH TECHNICAL UNIVERSITY IN PRAGUE
Faculty of electrical engineering
Department of electrical power engineering
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Master thesis opponent's review

Master thesis: **Low-carbon technology in distribution networks**
Author: **Abdullah Essa**
Thesis supervisor: **doc. Dr. Ing. Jan Kyncl**
Thesis opponent: **Ing. Josef Hrouda**

	Rating (1 – 5) (1 = best; 5 = worst):
1. Fulfillment of assignment requirements:	3
2. Systematic solutions of individual tasks:	1
3. Ability to apply knowledge and to use literature:	2
4. Thesis formal and language level:	1
5. Thesis readability and structuring:	1
6. Thesis professional level:	2
7. Conclusions and their formulation:	2
8. Final mark evaluation (A, B, C, D, E, F):	B

verbal:

Brief summary evaluation of the thesis (compulsory):

Author selected live topic of renewable sources (RES). The work is well structured where opening clauses deal with theory, general description of renewable resources and their penetration into European networks, while later clauses focus on analyzing existing RES in Egypt as well as the prognosis in that country. Before the case study is created, student describes the requirements for source connection in the Czech Republic distribution systems and details the problematics of wind generation with double-fed asynchronous motor. This power plant type is fully mathematically modeled and deals with d-q system. Case study was calculated in DNCalc software where various configurations were used to verify the Vestas V-90 wind power plant connectivity regarding the voltage variation and flicker correlating with short-circuit power. This, in my opinion, illustrates that the student is able to solve the practical task from the distribution system operation. More detailed description of elements which were modeled in the case study would be welcome as well as utilization of RES for microgrids. In context with complicated conditions associated with the COVID-19 situation, the work is considered to be successful and it is recommended to discussion.

Questions:

1. Does Vestas V-90 wind power plant support the voltage control?
2. How can the DSO increase the short-circuit power at source point of connection?

Date: Signature:

Notes:

1) The total thesis evaluation needn't be determined by the partial evaluations average.
2) The total evaluation (item 8) should be from the following scale:

excellent	very good	good	satisfactory	sufficient	insufficient
A	B	C	D	E	F