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Summary of the doctoral thesis entitled:

"Adaptive overload protection of transmission lines"

written by MSc. Łukasz Staszewski.

The doctoral thesis entitled "***Adaptive overload protection of transmission lines***" written by MSc. Łukasz Staszewski focuses on algorithms of basic protection of transmission lines in power systems (delayed and instantaneous overcurrent protection and distance protection) and considers possible use of additional algorithms based on Dynamic Line Rating, in order to improve the protection operation.

The aim of the doctoral thesis was to prove the thesis set at the beginning of the study: "***Adaptive overload protection of transmission lines with use of the Dynamic Line Rating techniques increases the capability of transmission lines and improves the safety of electrical power system operation.***"

To prove the above thesis analysis of selected large-scale failures were presented, with the aim of indicating common elements of formation and development of most blackouts. This made possible to identify the weak points of the current state power system protection, especially the transmission line protection, in the context of prevention of large-scale failures occurrence and development.

In the doctoral thesis analysis of the possibility of use of additional algorithms were also carried out, based on the Dynamic Line Rating, in order to increase the power transmission capacity of overhead transmission lines. There were also presented the results of comparative analysis of overhead lines ampacity designed in accordance with the current standards and the ampacity obtained by applying additional algorithms based on the Dynamic Line Rating.

The doctoral thesis also discussed in detail the transmission line protection indicated in the failure analysis of large-scale events, as often involved in their development. Particular attention was devoted to the decision-making algorithms of the protection relays and their maloperation, causing unnecessary operation during development of analyzed blackouts leading to enlarging the area covered by the failures.

The proposed algorithms supporting standard transmission line protection were tested through simulation analysis to demonstrate the legitimacy of their use and the correctness of

their decision-making. The research was carried out for the situation of overload, identified as one of the main events occurring during the formation and further development of large-scale failures, as well as selected short-circuit situations. In addition, the distance protection was also evaluated for asynchronous and synchronous power swings that were also considered as common events associated with the development of blackouts.

The last chapter of the doctoral thesis contains summary and conclusions that arose during the carried out analyzes.

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