

Documents

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A sensor failure resilience metric for ship-board power system

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Abstract

This study defines a metric of resilience to sensor faults for ship-board power system. Hence, one is able to compare different power system topology with respect to their robustness to sensor faults, which provides valuable information in the design phase. For a given power system topology, we first present a distributed wide area differential protection (DWAPS) scheme, that is able to cope with the difficulties caused by short cables used to connect the various busbars on board. The proposed scheme is an elaboration of previous studies yet integrates tools of intelligence at the relay level based on a communication with direct neighbors only, instead of a system wide communication, thus minimizing both the required bandwidth and the degree of connectivity between different relays. We then demonstrate how to explicitly reconstruct lost data after sensor failure. Finally, we define the minimum number of sensor that makes this restoration possible as sensor failure resilience metric. © 2011 IEEE.

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