

## Documents

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**A distributed fault protection method for power grid with high penetration of renewable energy sources**

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**Abstract**

This study addresses the fault protection issues that will be caused by the increased penetration of Renewable Energy Sources (RES). A new Distributed Wide Area Differential Protection (DWADP) scheme is proposed to overcome these problems, and hence to improve reliability of power systems. Tools of intelligence are integrated at the relay level, capable of generating optimal responses, based on 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. The proposed DWADP scheme contains a conventional differential protection scheme cascaded with a trip confirmation mechanism (TCM), which performs sensor data integrity evaluation, and a missing sensor restoration mechanism (MSRM). Hence, false trip can be avoided, while locating sensor failures, thus making it possible to take preventive action. © 2011 IEEE.

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