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An agent-based wide area protection scheme for self-healing grids

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Abstract

This paper presents a wide area protection multi-agent system with high degree of tolerance to faults. Agents in this protection system detect and locate faults by comparing current measurements across the protected component following principles of conventional differential protection; yet they perform sensor data integrity evaluation through a trip confirmation mechanism, by cooperating and collaborating with neighbor agents. This mechanism prevent from possible false trips caused by measurement failure or a failure of communication channel, resulting in explicit sensor failure detection and location. A missing sensor restoration mechanism is initiated to mitigate the effects of sensor failure, applying a self-healing strategy. The principles of cooperation and collaboration are presented, and the structure and hierarchy of protection agents are designed. © 2011 IEEE.

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