

An Application of Protection Management System

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Abstract

The fault information from protective relays and fault recorders is useful for dispatchers to identify the grid fault and resume the power supply promptly when a fault occurs in power grid. Traditionally, EMS/SCADA cannot collect the detailed fault information. The dispatchers realize the information by telephone or making a trip to the substation.

An application of protection management system (PMS) is proposed in the discussion. The system acquires fault information from protective relays and fault recorders automatically. It consists of the master system, the slave system and high-speed communication channel. The slave systems in substations or plants connect with protection relays and fault recorders through Ethernet, RS485 or other media, collect fault information from IEDs, and transfer the information to the master system in the power grid dispatching center. The master system is a platform of fault information intelligent processing. In case of grid fault, the master system concentrates relevant fault information from slave systems and forms the fault report for the dispatchers automatically via fault processing function. The report includes fault device, fault feature, relays action data and so on. Also, the system provides the fault waveform file to do more analysis such as vector analysis, harmonics analysis for the dispatchers. In normal state of the grid, the dispatchers can monitor the running states of relays and fault recorders. Meanwhile, the system provides functions include calling settings, analog, digital values of the IEDs to check values in real-time. The system has been carried out in many large district grid in China.

The discussion concludes that PMS is a system that can promote the automatic level of the protective relay management, enhance the ability to monitor and control the power grid. PMS will have an active impact on stage of building smart grid. To analyze grid fault more roundly, the paper recommends that PMS should integrate with EMS, combine data of secondary device with primary device such as topological information, breaker status to analyze the complex grid fault comprehensively and do some decision smartly.

Keywords

Protection Management System, Fault Information, Fault Analysis, Smart Grid