Emerging Applications for IEC 61850 in Process Industry Power Distribution Systems

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Applications for the usage of IEC 61850 in the industrial sector and process-based industries have started to gain traction with new products, applications, and engineering practices. This emerging technology has enabled the “digitization” of the protection and controls schemes for industrial power distribution systems. Utility markets around the globe have been embracing and expanding this IEC standard to transform the current state of the legacy grid into the envisioned Smart Grid. The industrial sector has the desire to achieve real-time acquisition of data, communication and logical control of the power system, integration of all types of components, high-availability of protection and control systems, and the interoperability of intelligent electronic devices (IEDs) and other integrated networkable devices with other parts and pieces of the industrial Distributed Control System (DCS), and the technology discussed will be one of many facilitators in the future of the “Industrial Smart Grid.” This paper intends to explore and develop an understanding of the tools held within this protocol and associated products integrating communication with IEC 61850. As an example, many of the applications, such as load-shedding and main-tie-main schemes, can be accomplished utilizing IEC 61850 and simplified in their overall implementation with greater redundancies and capabilities with the IEDs utilizing this protocol. As the technology gains traction in the industrial sector, enhancements to the reliability, monitoring, and decision-making of the plant will be seen and the usage of digital protection and control schemes will provide the reliability and capability electrical professionals desire in enhancing the visibility and decision-making for operators, enhancement to plant processes, and greater safety for their operations.