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Looking into the Future Protection, Automation and Control Systems

**Working Group K15 of the Substations Subcommittee
IEEE Power System Relaying Committee**

Ratan Das, icaPower

Abstract:

Coupled by the industry drive towards improved reliability and resiliency of the grid, the renewed focus on protection, automation and control is required to address the challenges. One possible future direction for protection, automation, and control systems is Centralized Protection and Control (CPC). The CPC concept has been inherent to the idea of “computer relaying”, proposed in the 70s but the technology not capable of a practical implementation at that time. Advancements in communication technologies provide opportunities for protection, automation and control strategies that build upon the available and emerging technologies, and related industry standards, which can be applied to support a strong long-term business case, now support the reality of CPC. CPC system is comprised of a high-performance computing platform capable of providing protection, control, monitoring, communication and asset management functions by collecting the data those functions require using high-speed, time synchronized measurements within a substation.

This presentation is based on the IEEE PES PSRC report “Centralized Substation Protection and Control”. The presentation starts with the history of CPC with a review of past systems. The majority of the discussion in the presentation is on the realities of using CPC: architecture, reliability, testing, and maintenance of the system. The presentation also shares the experience of a pilot CPC project using available technologies. Using this example, the presentation discusses emerging and future applications for protection and control which will require a paradigm shift in the way we approach the engineering, operation and maintenance of the power system protection, automation and control. Some of these applications can only be applied with a CPC approach while others will significantly benefit from having the high-performance computing platform at the substation which centralizes protection, automation and control.

Reference:

IEEE Power System Relaying Committee WG K15 Report, “Centralized Substation Protection and Control,” December, 2015. [Online]. Available: http://www.pes-psrc.org/Reports/IEEE_PES_PSRC_WG%20K15_Report_CPC_Dec_2015.pdf