

Integrating Distributed Generation into Smart Grids

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Abstract

Power systems (defined as the electricity infrastructure of generation, transmission and distribution and the consumer) have served the needs of society for well over 100 years. During this time, the owners of the various components of the power system have integrated technologies to provide reliable and affordable electricity service. The existing power system provides the backbone to integrate new technologies using an optimal approach deploying existing components to support the integration to newer and diverse elements.

The power system rejuvenation and renewal, with advanced hardware to meet future consumer requirements, will provide substantial benefits. As a corollary, applications of intelligent devices are not immediately required system-wide. Necessarily, as with all other implementations of advanced technology in power systems, system applications focused on the power system rejuvenation, much like urban renewal programs, will begin with demonstrations on critical portions of the power system, meeting focused needs and with easily defined benefits, thus augmenting the existing power system.

Distributed Energy Resources have the potential for deep penetration into the distribution system. The full benefits will evolve towards a fuller implementation over time and will ensure that as new intelligent controllers become available, their integration will be easier and the full benefits realizable.