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Transforming the Grid with Superconductivity

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The electric power grid in the United States faces critical challenges: overloading caused by years of limited investment and steady load growth, bottlenecks in power corridors into urban centers, voltage instability leading to brownouts and blackouts, growing fault currents in large urban and suburban areas, as well as the need for increased efficiency. Power equipment based on high temperature superconductors (HTS) offers solutions to these challenges: high capacity, non-interfering HTS cables addressing power bottlenecks, HTS fault current limiters controlling fault currents, HTS synchronous condensers and novel controllability features of HTS cables which address stability issues, HTS transformers and generators with increased efficiency. A variety of commercial-level demonstrations make the impact of HTS power equipment imminent.