

Reliability Terminology

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Knowing the Terms

NERC defines the reliability of the interconnected Bulk-Power System in terms of two basic and functional aspects. These aspects are:

1. **Adequacy:** The ability of the electricity system to supply the aggregate electrical demand and energy requirements of the end-use customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.
2. **Operating Reliability:** The ability of the Bulk-Power System to withstand sudden disturbances, such as electric short circuits or the unanticipated loss of system elements from credible contingencies, while avoiding uncontrolled cascading blackouts or damage to equipment.

Regarding adequacy, system operators can and should take controlled actions or procedures to maintain a continual balance between supply and demand within a balancing area. These actions include:

- Public appeals;
- Interruptible demand (i.e., customer demand that, in accordance with contractual arrangements, can be interrupted by direct control of the system operator or by action of the customer at the direct request of the system operator);
- Voltage reductions (also referred to as “brownouts” because lights dim as voltage is lowered); and
- Rotating blackouts (i.e., the term used when each set of distribution feeders is interrupted for a limited time, typically 20–30 minutes, and then those feeders are put back in service and another set is interrupted, and so on, rotating the outages among individual feeders).

All other system disturbances that result in the unplanned or uncontrolled interruption of customer demand, regardless of cause, fall under the heading of operating reliability. When these interruptions are contained within a localized area, they are considered unplanned interruptions or disturbances. When they spread over a wide area of the grid, they are referred to as cascading blackouts—the uncontrolled successive loss of system elements triggered by an incident at any location. Cascading results in widespread electric service interruption that cannot be restrained from sequentially spreading beyond an area predetermined by studies.

Uncontrolled cascading blackouts occurred in 1965 and 2003 in the Northeast and in 2011 in the Southwest. What happened in the summer of 2000 in California, when supply was insufficient to meet all the demand, was a “rotating blackout” or controlled interruption of customer demand to maintain a balance with available supplies while maintaining the overall operating reliability of the interconnected system.