**North American Electric Reliability Corporation**

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| North American Electric Reliability Corporation | |
| The four NERC Interconnections, and the eight NERC Regional Reliability Councils` | |
| **Abbreviation** | NERC |
| **Formation** | March 28, 2006 (2006-03-28) |
| **Founded at** | [Atlanta, Georgia](https://en.wikipedia.org/wiki/Atlanta,_Georgia) |
| **Type** | 501(c)(6) |
| [**Tax ID no.**](https://en.wikipedia.org/wiki/Taxpayer_Identification_Number) | 20-4821888 |
| **Legal status** | Active |
| **Headquarters** | [Atlanta, Georgia](https://en.wikipedia.org/wiki/Atlanta,_Georgia) |
| **Coordinates** | [33°50′51″N 84°22′00″W﻿ / ﻿33.847404°N 84.366719°W﻿ / 33.847404; -84.366719](https://tools.wmflabs.org/geohack/geohack.php?pagename=North_American_Electric_Reliability_Corporation&params=33.847404_N_-84.366719_E_)[Coordinates](https://en.wikipedia.org/wiki/Geographic_coordinate_system): [33°50′51″N 84°22′00″W﻿ / ﻿33.847404°N 84.366719°W﻿ / 33.847404; -84.366719](https://tools.wmflabs.org/geohack/geohack.php?pagename=North_American_Electric_Reliability_Corporation&params=33.847404_N_-84.366719_E_) |
| **Region** | Contiguous [United States](https://en.wikipedia.org/wiki/United_States), [Canada](https://en.wikipedia.org/wiki/Canada) and a portion of [Baja California](https://en.wikipedia.org/wiki/Baja_California_(state)) in [Mexico](https://en.wikipedia.org/wiki/Mexico) |
| **Membership** (2015) | 1,900+ |
| **President &** [**CEO**](https://en.wikipedia.org/wiki/Chief_executive_officer) | Gerry W. Cauley |
| [**Senior Vice President**](https://en.wikipedia.org/wiki/Vice_president#In_business) | Mark Lauby |
| **Sr. VP, CFO, & Treasurer** | Michael Walker |
| [**Board of directors**](https://en.wikipedia.org/wiki/Board_of_directors) | * Frederick W. Gorbet (Chair) * Robert G. Clarke (Vice Chair) * Gerry Cauley * Paul F. Barber * Janice B. Case * David Goulding * George S. Hawkins * Kenneth G. Peterson * Jan Schori * Roy Thilly |
| [**Subsidiaries**](https://en.wikipedia.org/wiki/Subsidiary) | * [Northeast Power Coordinating Council](https://en.wikipedia.org/wiki/Northeast_Power_Coordinating_Council) (NPCC) * [Midwest Reliability Organization](https://en.wikipedia.org/wiki/Midwest_Reliability_Organization) (MRO) * [Florida Reliability Coordinating Council](https://en.wikipedia.org/wiki/Florida_Reliability_Coordinating_Council) (FRCC) * [Southwest Power Pool](https://en.wikipedia.org/wiki/Southwest_Power_Pool) (SPP) * [SERC Reliability Corporation](https://en.wikipedia.org/wiki/SERC_Reliability_Corporation) (SERC) * [ReliabilityFirst](https://en.wikipedia.org/wiki/ReliabilityFirst) (RF) * [Texas Reliability Entity](https://en.wikipedia.org/wiki/Electric_Reliability_Council_of_Texas) (TRE) * [Western Electricity Coordinating Council](https://en.wikipedia.org/wiki/Western_Electricity_Coordinating_Council) (WECC) |
| **Budget** (2015) | [$](https://en.wikipedia.org/wiki/United_States_dollar)66.6 million |
| **Staff** | 198 |
| [**Slogan**](https://en.wikipedia.org/wiki/Slogan) | Reliability/Accountability |
| [**Mission**](https://en.wikipedia.org/wiki/Mission_statement) | To ensure the reliability of the bulk power system in North America, including the continental United States and Canada, and the northern portion of Baja California, Mexico. |
| **Website** | [www.nerc.com](http://www.nerc.com/) |
| **Formerly called** | North American Electric Reliability Council |

The **North American Electric Reliability Corporation** (**NERC**) is a [nonprofit](https://en.wikipedia.org/wiki/Nonprofit) corporation based in [Atlanta, Georgia](https://en.wikipedia.org/wiki/Atlanta,_Georgia), and formed on March 28, 2006, as the successor to the North American Electric Reliability Council (also known as NERC). The original NERC was formed on June 1, 1968, by the electric utility industry to promote the reliability and adequacy of [bulk power transmission](https://en.wikipedia.org/wiki/Bulk_power_transmission) in the electric utility systems of [North America](https://en.wikipedia.org/wiki/North_America). NERC's mission states that it is to "ensure the reliability of the North American bulk power system."

NERC oversees eight regional reliability entities and encompasses all of the [interconnected power systems](https://en.wikipedia.org/wiki/Wide_area_synchronous_grid) of the contiguous [United States](https://en.wikipedia.org/wiki/United_States), [Canada](https://en.wikipedia.org/wiki/Canada) and a portion of [Baja California](https://en.wikipedia.org/wiki/Baja_California_(state)) in [Mexico](https://en.wikipedia.org/wiki/Mexico).

NERC's major responsibilities include working with all stakeholders to develop standards for power system operation, monitoring and [enforcing compliance](https://en.wikipedia.org/wiki/Regulatory_compliance) with those standards, assessing resource adequacy, and providing educational and training resources as part of an accreditation program to ensure power system operators remain qualified and proficient. NERC also investigates and analyzes the causes of significant power system disturbances in order to help prevent future events.

**Origins of NERC**

Early electric power systems, such as those installed by [George Westinghouse](https://en.wikipedia.org/wiki/George_Westinghouse) and [Thomas Edison](https://en.wikipedia.org/wiki/Thomas_Edison), prior to the start of the 20th century were isolated central stations which served small pockets of customers independently of each other. As some of these power systems grew to cover larger geographic areas, it became possible to connect previously isolated systems. This allowed neighboring systems to share generation and voltage stability resources, providing mutual benefit to each side. However, tying power systems together with these early interconnections also introduced the risk that a single significant disturbance could collapse all of the systems tied to the interconnection. Generally it was decided that the benefits outweighed the risks, and by 1915 interconnections began to flourish and grow in size. By the end of the 1960s there were virtually no isolated power systems remaining in the lower forty-eight states and southern Canada; practically all power companies were attached to large interconnections.

In 1962, when the [Eastern Interconnection](https://en.wikipedia.org/wiki/Eastern_Interconnection) was established in its current form, The Interconnected Systems Group (composed of Southern and Midwestern utility companies), the [PJM Interconnection](https://en.wikipedia.org/wiki/PJM_Interconnection), and the [Canada-United States Eastern Interconnection (CANUSE)](https://en.wikipedia.org/wiki/Northeast_Power_Coordinating_Council) formed the Interconnection Coordination Committee to recommend an informal operations structure, which led to the formation of the North American Power Systems Interconnection Committee (NAPSIC). NAPSIC eventually grew to also include the [Texas Interconnection](https://en.wikipedia.org/wiki/Texas_Interconnection) and most of the companies in what is today the [Western Electricity Coordinating Council (WECC)](https://en.wikipedia.org/wiki/Western_Electricity_Coordinating_Council), operating within the [Western Interconnection](https://en.wikipedia.org/wiki/Western_Interconnection).

On November 9, 1965, a relatively minor system disturbance triggered a power system protection component that was not properly configured. The interconnection was operating near peak capacity due to the extreme cold weather and high heating demand, and was therefore more vulnerable than usual. The small initial outage quickly [cascaded](https://en.wikipedia.org/wiki/Cascading_failure) into the [Northeast Blackout of 1965](https://en.wikipedia.org/wiki/Northeast_Blackout_of_1965). This disturbance revealed the extent that interconnections had evolved without adequate high-level planning and operating oversight to try to prevent such events, and that interconnected power systems frequently had varying operating standards and procedures developed somewhat independently by each member on the interconnection. Restoration efforts were also partially hampered due to the lack of common practices and coordination procedures. Furthermore, power system protection schemes were often designed with only a local power system's design in mind, meaning that they might mis-operate in response to protection schemes activating in neighboring systems. This disturbance revealed the necessity to develop common operating and protection standards as well as plans to effectively coordinate power system restoration efforts.

The [Electric Reliability Act of 1967](https://en.wikipedia.org/w/index.php?title=Electric_Reliability_Act_of_1967&action=edit&redlink=1) proposed the creation of a council on power coordination. Although not enacted, the proposed legislation stimulated the development of an industry reliability council. The Federal Power Commission (predecessor of the Federal Energy Regulatory Commission) recommended the formation of a council on power coordination made up of representatives from each of the nation’s regional coordinating organizations, to exchange and disseminate information and to review, discuss and assist in resolving interregional coordination matters.

The North American Electric Reliability Council (NERC) was established by the electric utility industry, in response to the 1965 blackout. Nine regional reliability organizations were formalized under NERC. Also formalized were regional planning coordination guides, which NERC maintained. NAPSIC operations criteria and guides continued to be maintained and practiced voluntarily.

Although significant disturbances continued to occasionally occur, such as the [New York City blackout of 1977](https://en.wikipedia.org/wiki/New_York_City_blackout_of_1977), NERC undoubtedly played a significant role in minimizing the impact and frequency of these events. It is difficult to quantify this success because it is impossible to know how many disturbances were prevented by the influence of NERC and the reliability councils.

**NERC today**

Out of its long history, NERC developed a complex committee structure which brings together hundreds of industry expert volunteers in nearly 50 committees, sub-committees, task forces, and working groups considering issues from wind and renewable power integration to education to demand-side management and energy efficiency. NERC's role in raising awareness of reliability issues and creating the impetus to address them is intended to improve reliability every day.

With the passage of the Energy Policy Act of 2005, an Electric Reliability Organization ([ERO](https://en.wikipedia.org/wiki/List_of_energy_abbreviations)) was created to develop and enforce compliance with mandatory reliability standards in the U.S. This non-governmental, "self-regulatory organization" was created in recognition of the interconnected and international nature of the bulk power grid. In 2006, NERC applied for and was granted this designation.

Today, NERC's standards are mandatory and enforceable throughout the United States and several [provinces](https://en.wikipedia.org/wiki/Provinces_and_territories_of_Canada) in Canada. Electric utilities and/or energy concerns in the states of [Alaska](https://en.wikipedia.org/wiki/Alaska) and [Hawaii](https://en.wikipedia.org/wiki/Hawaii), the [American Commonwealth](https://en.wikipedia.org/wiki/Commonwealth_(U.S._insular_area)) of [Puerto Rico](https://en.wikipedia.org/wiki/Puerto_Rico), and the territories of [American Samoa](https://en.wikipedia.org/wiki/American_Samoa), [Guam](https://en.wikipedia.org/wiki/Guam), and the [Virgin Islands](https://en.wikipedia.org/wiki/United_States_Virgin_Islands) are not under reliability oversight by NERC. Entities in the U.S. found to be in violation of a standard can be subject to fines of up to $1 million per day per violation.

**Interconnections and Reliability Councils**



The [electric power transmission](https://en.wikipedia.org/wiki/Electric_power_transmission) [grid](https://en.wikipedia.org/wiki/Electrical_grid) of the [contiguous United States](https://en.wikipedia.org/wiki/Contiguous_United_States) consists of 190,000 kilometers (120,000 mi) of lines operated by 500 companies.

**Major interconnections**

* The [Eastern Interconnection](https://en.wikipedia.org/wiki/Eastern_Interconnection) covers most of eastern North America, extending from the foot of the [Rocky Mountains](https://en.wikipedia.org/wiki/Rocky_Mountains) to the Atlantic seaboard, excluding most of Texas. The Eastern Interconnection is tied to the Western Interconnection via high voltage [DC](https://en.wikipedia.org/wiki/Direct_current) transmission facilities and also has ties to non-NERC systems in northern Canada. The regional reliability entities within the Eastern Interconnection are:
  + [Florida Reliability Coordinating Council (FRCC)](https://en.wikipedia.org/wiki/Florida_Reliability_Coordinating_Council)
  + [Midwest Reliability Organization (MRO)](https://en.wikipedia.org/wiki/Midwest_Reliability_Organization)
  + [Northeast Power Coordinating Council (NPCC)](https://en.wikipedia.org/wiki/Northeast_Power_Coordinating_Council)
  + [ReliabilityFirst (RF)](https://en.wikipedia.org/wiki/ReliabilityFirst)
  + [SERC Reliability Corporation (SERC)](https://en.wikipedia.org/wiki/SERC_Reliability_Corporation)
  + [Southwest Power Pool, Inc. (SPP)](https://en.wikipedia.org/wiki/Southwest_Power_Pool)
* The [Western Interconnection](https://en.wikipedia.org/wiki/Western_Interconnection) covers most of western North America, from the [Rocky Mountains](https://en.wikipedia.org/wiki/Rocky_Mountains) to the Pacific coast. It is tied to the Eastern Interconnection at six points, and also has ties to non-NERC systems in northern Canada and Northwestern Mexico. The reliability council for the Western Interconnection is:
  + [Western Electricity Coordinating Council (WECC)](https://en.wikipedia.org/wiki/Western_Electricity_Coordinating_Council)

**Minor interconnections**

* The [Texas Interconnection](https://en.wikipedia.org/wiki/Texas_Interconnection) covers most of the state of [Texas](https://en.wikipedia.org/wiki/Texas). It is tied to the Eastern Interconnection at two points, and also has ties to non-NERC systems in Mexico. The regional reliability entity for the Texas Interconnection is:
  + [Texas Reliability Entity](https://en.wikipedia.org/w/index.php?title=Texas_Reliability_Entity&action=edit&redlink=1) (TRE), formerly Texas Regional Entity which was an independent division of the [Electric Reliability Council of Texas](https://en.wikipedia.org/wiki/Electric_Reliability_Council_of_Texas) (ERCOT).
* The [Quebec Interconnection](https://en.wikipedia.org/wiki/Quebec_Interconnection) covers the province of [Quebec](https://en.wikipedia.org/wiki/Quebec) and is tied to the Eastern Interconnection at two points. About one third of Canada's installed power (42 MW out of 130) and about one third of Canada's production (184 TWh out of 567) are in this interconnection. Despite being a functionally separate interconnection, the Quebec Interconnection is often considered to be part of the Eastern Interconnection. The reliability council for the Quebec Interconnection is:
  + [Northeast Power Coordinating Council (NPCC)](https://en.wikipedia.org/wiki/Northeast_Power_Coordinating_Council)
* The [Alaska Interconnection](https://en.wikipedia.org/w/index.php?title=Alaska_Interconnection&action=edit&redlink=1) covers a portion of the state of [Alaska](https://en.wikipedia.org/wiki/Alaska) and is not tied to any other interconnections. Due to its isolated nature, the Alaska Interconnection is not generally counted among North America's interconnections. The reliability council for the Alaska Interconnection is:
  + [Alaska Systems Coordinating Council (ASCC)](https://en.wikipedia.org/wiki/Alaska_Systems_Coordinating_Council), an affiliate member of NERC

**NERC Authority**

As part of the fallout of the [Northeast Blackout of 2003](https://en.wikipedia.org/wiki/Northeast_Blackout_of_2003), the [Energy Policy Act of 2005](https://en.wikipedia.org/wiki/Energy_Policy_Act_of_2005) authorized the [Federal Energy Regulatory Commission (FERC)](https://en.wikipedia.org/wiki/Federal_Energy_Regulatory_Commission) to designate a national Electric Reliability Organization (ERO). On July 20, 2006, FERC issued an order certifying NERC as the ERO for the United States. Prior to being the National ERO, NERC's guidelines for power system operation and accreditation were referred to as *Policies*, for which compliance was strongly encouraged yet ultimately voluntary. NERC has worked with all stakeholders over the past several years to revise its Policies into *Standards*, and now has authority to enforce those standards on power system entities operating in the [United States](https://en.wikipedia.org/wiki/United_States), as well as several provinces in Canada, by way of significant financial penalties for noncompliance. Efforts between NERC and the Canadian and Mexican governments are underway to obtain comparable authority for NERC to enforce its standards on the NERC member systems residing outside of the United States.

**Cyber warfare**

In April 2009, NERC issued a public notice that warns that the electrical grid is not adequately protected from [cyberwarfare](https://en.wikipedia.org/wiki/Cyberwarfare).

**See also**

* [Critical infrastructure protection](https://en.wikipedia.org/wiki/Critical_infrastructure_protection)
* [Grid reliability](https://en.wikipedia.org/w/index.php?title=Grid_reliability&action=edit&redlink=1)
* [Federal Energy Regulatory Commission (FERC)](https://en.wikipedia.org/wiki/Federal_Energy_Regulatory_Commission)
* [NERC Tag](https://en.wikipedia.org/wiki/NERC_Tag) Energy Transaction Tracking Application
* [Vehicle-to-grid](https://en.wikipedia.org/wiki/Vehicle-to-grid)
* [NERC's Annual Long-Term, Seasonal, and Special Reliability Assessments](http://www.nerc.com/pa/RAPA/ra/Pages/default.aspx)
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