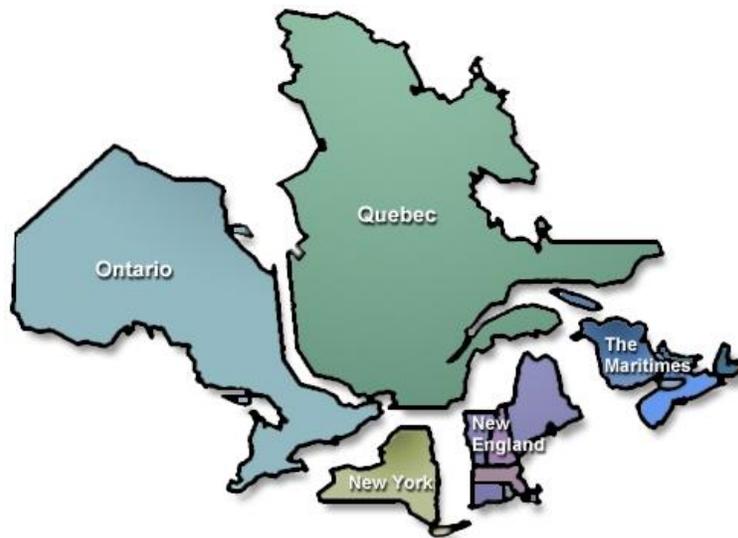




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Northeast Power Coordinating Council, Inc.

Glossary of Terms



Approved by the Reliability Standards Committee

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Revision History

Version	Date	Action	Change Tracking (New, Errata or Revisions)
0	10/26/2011	NPCC Glossary of Terms Established; Retired A7.	New
1	1/18/2012	TFSP revised definition of Special Protection System.	Revisions
2	11/03/2017	TFCO Directory 8 Glossary Term Updates. TFSP Directory 4 Glossary Term Updates.	Revisions

Note: Terms highlighted in blue are defined differently in the NERC Glossary of Terms

Term	Acronym	Definition	Directories that use this term
Actual Interchange		Metered electric power that flows from one entity to another.	D5
Applicable emergency limits		<p>These limits depend on the duration of the occurrence, and on the policy of the various member systems of NPCC regarding loss of life to equipment, voltage limitations, etc.</p> <p>Emergency limits are those which can be utilized for the time required to take corrective action, but in no case less than five minutes.</p> <p>The limiting condition for voltages should recognize that voltages should not drop below that required for suitable system stability performance, and should not adversely affect the operation of the bulk power system.</p> <p>The limiting condition for equipment loadings should be such that cascading outages will not occur due to operation of protective devices upon the failure of facilities. (Various definitions of equipment ratings are found elsewhere in this glossary.)</p>	D1 D7
Area		An Area (when capitalized) refers to one of the following: New England, New York, Ontario, Quebec or the Maritimes (New Brunswick, Nova Scotia and Prince Edward Island); or, as the situation requires, area (lower case) may mean a part of a system or more than a single system. Within NPCC, Areas (capitalized) operate as control areas as defined by the North American Electric Reliability Council (NERC) (the definition of control area can be found in the NPCC Glossary of Terms Not Used by any Directories section of this NPCC Glossary of Terms.)	D1 D7 D8 D12
Area Control Error	ACE	The instantaneous difference between a Balancing Authority’s net actual and scheduled interchange, taking into account the effects of Frequency Bias and correction for meter error.	D2 D5 D8

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Term	Acronym	Definition	Directories that use this term
		(Source: NERC Glossary of Terms)	
Automatic Generation Control	AGC	Equipment that automatically adjusts generation in a Balancing Authority Area from a central location to maintain the Balancing Authority’s interchange schedule plus Frequency Bias. AGC may also accommodate automatic inadvertent payback and time error correction. (Source: NERC Glossary of Terms)	D2 D5 D8
Apparent Power		The product of the volts and amperes. It comprises both Real Power and Reactive Power , usually expressed in kilo volt amperes (kVA) or megavolt amperes (MVA).	
Basic Minimum Power System		Consists of one or more generating stations, transmission lines, and substations operating in the form of an island for the purpose of initiating the restoration process. The Reliability Coordinator shall identify, in conjunction with all affected parties or entities, its Area’s basic minimum power system(s) within its system restoration plan.	D8
Bipolar		Operation of HVdc with two poles of opposite polarity with negligible ground current.	D1
Blackstart Capability		The ability of a generating unit or station to go from a shutdown condition to an operating condition and start delivering power without assistance from the electric system.	D8
Bulk Power System	BPS	The interconnected electrical systems within northeastern North America comprised of system elements on which faults or disturbances can have a significant adverse impact outside of the local area .	D1 D2 D3 D4 D7 D9 D10

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Term	Acronym	Definition	Directories that use this term
Cable		An underground or underwater circuit.	D4 D5 D7 D8
Capacity		The rated continuous load-carrying ability, expressed in megawatts (MW) or megavolt-amperes (MVA) of generation , transmission, or other electrical equipment.	D1 D2 D5 D8
Commutation Failure		A fault in a thyristor valve group where the current transfer from one valve to the next is interrupted.	D4
Component		Refers to components of equipment or protection systems rather than elements of a power system. See Element .	D1 D3 D7
Contingency		An event, usually involving the loss of one or more elements , which affects the power system at least momentarily.	D1 D2 D5 D7
Converter		An operative unit comprised of either a rectifier or inverter bridge connected to an ac system through transformers and switching devices with the associated control equipment.	D4
Converter Transformer		A power transformer which transfers the energy from the thyristor valves to the connected ac system and vice-versa.	D4
Critical Components		Equipment required for continued and proper operation of a key facility in the event of a total loss of grid supply and for performing load restoration . Critical components include but are not limited to the following: <ul style="list-style-type: none"> ▪ Generating units with blackstart capability; ▪ Backup power supplies; ▪ Control center and telecommunication center computer systems and computer room HVAC; 	D8

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		<ul style="list-style-type: none"> ▪ Telecommunication facilities backup power supplies; ▪ Cable pressurization units; ▪ Synchronizing systems. 	
DC Circuit		A set of protection and/or control equipment connected by wire under a common DC circuit breaker or fuse. This DC circuit breaker or fuse is the most immediate device to isolate the aforementioned set of protection and/or control equipment connected by wire from the DC power supply that does not also remove the DC power supply from other equipment.	
Declared Capability (of a generator or generating facility)		The facility ratings submitted by the Generator Owner to the respective Transmission Operator as per NERC Standard FAC-009.	D10
Delayed Fault Clearing		<p>Fault clearing consistent with correct operation of a breaker failure protection system and its associated breakers, or of a backup protection system with an intentional time delay.</p> <p>(Source: NERC Glossary of Terms)</p>	D1
Demand		<ol style="list-style-type: none"> 1. The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time. 2. The rate at which energy is being used by the customer. <p>(Source: NERC Glossary of Terms)</p>	D1 D5
Disturbance		Severe oscillations or severe step changes of current, voltage and/or frequency usually caused by faults .	D1 D2 D4 D5

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			D7
Disturbance Monitoring Equipment	DME	<p>Devices capable of monitoring and recording system data pertaining to a Disturbance. Such devices include the following categories of recorders²</p> <ul style="list-style-type: none"> • Sequence of event recorders which record equipment response to the event; • Fault recorders, which record actual waveform data replicating the system primary voltages and currents. This may include protective relays; • Dynamic Disturbance Recorders (DDRs), which record incidents that portray power system behavior during dynamic events such as low-frequency (0.1 Hz – 3 Hz) oscillations and abnormal frequency or voltage excursions <p>(Source: NERC Glossary of Terms)</p>	D4
Economic Dispatch		<p>The allocation of demand to individual generating units on line to effect the most economical production of electricity.</p> <p>(Source: NERC Glossary of Terms)</p>	D2
Element		<p>Any electrical device with terminals that may be connected to other electrical devices such as a generator, transformer, circuit breaker, bus section, or transmission line. An element may be comprised of one or more components.</p> <p>(Source: NERC Glossary of Terms)</p>	D1 D2 D4 D5 D7 D9 D10
Emergency		<p>Any abnormal system condition that requires automatic or manual action to prevent or limit loss of transmission facilities or generation supply that</p>	D1 D2

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		<p>could adversely affect the reliability of the electric system.</p> <p><u>NPCC Specific Definition:</u></p> <p>Emergency — An Emergency is considered to exist in an Area if firm load may have to be shed.</p>	<p>D4 D5 D7</p>
Emergency Regional Reserve Redispatch		The regional coordination of actions to enhance reliability among Areas in response to a Regional Reserve Deficiency .	D5
Emergency Regional Reserve Dispatch Energy		Electrical energy that is received and delivered among Areas in response to a Regional Reserve Deficiency to enhance regional reliability .	D5
Emergency Transfer Capability		The amount of power transfer allowed between <u>Areas</u> or within an <u>Area</u> when operating to meet NPCC emergency criteria contingencies [as defined in Directory #1].	D2
Energize		To make a piece of equipment or circuit alive.	D4
Fault		An electrical short circuit .	D1 D4 D7
Firm Capacity		Capacity that is as firm as the seller’s native load unless modified by contract. Associated energy may or may not be taken at option of purchaser. Supporting reserve is carried by the seller.	D1
Firm Load		<p>That portion of the Demand that a power supplier is obligated to provide except when system reliability is threatened or during emergency conditions.</p> <p>(Source: Firm Demand defined in NERC Glossary of Terms)</p>	D1 D2

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First Contingency Loss		The largest capacity outage including any assigned Ten-Minute Reserve which would result from the loss of a single element .	D5
Forced Outage		1. The removal from service availability of a generating unit, transmission line, or other facility for emergency reasons. 2. The condition in which the equipment is unavailable due to unanticipated failure. (Source: NERC Glossary of Terms)	D1
Galvanic Isolation		The separation of two or more items or components such that no electrical current can traverse between them under normal operating conditions. The components may be discrete devices such as: relays ; wire/cables; relay panels, etc. or the separation can be on a single device such as that between traces on a circuit board. The electrical separation of components that prevents current flow between these components is, in essence, electrical (galvanic) isolation .	
Generation (Electricity)		The process of producing electrical energy from other forms of energy; also, the amount of electric energy produced, usually expressed in kilowatthours (kWh) or megawatthours (MWh). Gross Generation — The electrical output at the terminals of the generator, usually expressed in megawatts (MW). Net Generation — Gross generation minus station service or unit service power requirements, usually expressed in megawatts (MW).	D1 D2 D4 (Appendix A) D5 D7 (Appendices) D12
Generation Facility		Generating units, which are modeled as a single entity by the Transmission Operator.	D8 D9 D10
Generation Rejection		The process of deliberately removing preselected generation from a power system, or initiating HVdc power runback, in response to a contingency or	D1 D7

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		an abnormal condition in order to maintain the integrity of the system. Synonym: Generator Dropping.	
Gross Real Power Capability (of a generator or generating facility)		The maximum megawatt output at the generator terminals, at the normally expected system conditions for that seasonal capability period.	D9
Gross Reactive Power Capability (of a generator or generating facility)		The maximum lagging and leading reactive capability at the generator terminals and at a specified Gross Real Power output for a specific seasonal capability period.	D10
Grounded		Connected to earth or some extended conducting body that serves instead of the earth, whether the connection is intentional or accidental.	D4 D7
Harmonic		A sinusoidal component of a periodic wave or quantity having a frequency that is an integral multiple of the fundamental frequency. Note: For example, a component, the frequency of which is twice the fundamental frequency, is called a second harmonic.	D4
HVdc Link		A high Voltage direct current connection between two power systems often used to interconnect two asynchronous power systems.	D4
IED (Intelligent Electronic Device)		A microprocessor-based device equipped with digital communication abilities, some examples are protective relays , RTUs, SERs, DFRs, PLCs, data concentrators, telecommunications equipment, merging units , remote I/O units, and general monitoring equipment.	
Inadvertent Interchange		The difference between the Balancing Authority's Net Actual Interchange and Net Scheduled Interchange. (IA – IS) (Source: NERC Glossary of Terms)	D5
Interconnection		When capitalized, any one of the five major electric system networks in	D1

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		North America: Eastern, Western, ERCOT, Québec, and Alaska. When not capitalized, the facilities that connect two systems or Control Areas . Additionally, an interconnection refers to the facilities that connect a nonutility generator to a Control Area or system.	D2 D5 D8 D12
Interchange		Energy transfers that cross Balancing Authority boundaries. (Source: NERC Glossary of Terms)	D1 (Appendix B) D2 D5
Interchange Schedule		An agreed-upon Interchange Transaction size (megawatts), start and end time, beginning and ending ramp times and rate, and type required for delivery and receipt of power and energy between the Source and Sink Balancing Authorities involved in the transaction. (Source: NERC Glossary of Terms)	D1 D5
Interface		The specific set of transmission elements between two areas or between two areas comprising one or more electrical systems.	D1 (Appendices)
Interruptible Load		Demand that the end-use customer makes available to its Load-Serving Entity via contract or agreement for curtailment. (Source: NERC Glossary of Terms)	D1 (Appendix D) D5
Island		A portion of a power system or several power systems that is electrically separated from the interconnection due to the disconnection of transmission system elements .	D1 D8 D12
Key Facilities		Facilities required to establish a basic minimum power system following a system blackout. These facilities are essential to the restoration plan of the Reliability Coordinator Area and include generating stations having blackstart units and other selected generating stations, transmission elements which are part of the basic minimum power system , control centers, telecommunication centers and telecommunication facilities. Such	D8

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		<p>facilities are necessary to support Special Protection Systems, protection and control systems, voice and data between and within control centers and voice and data between control centers and key generating / transmission stations.</p> <p>Key Facilities include but are not limited to the following:</p> <ul style="list-style-type: none"> • Generating stations having Blackstart Capability; • Transmission facilities and generating stations; • Control and telecommunication centers; • Telecommunication facilities 	
Load		<p>An end-use device or customer that receives power from the electric system.</p> <p>(Source: NERC Glossary of Terms)</p>	<p>D1 D2 D3 D4 D5 D7 (Appendices) D8 D9 D10 D12</p>
Load Relief		Load reduction accomplished by voltage reduction and/or load shedding .	D1
Load Shedding		The process of deliberately removing (either manually or automatically) preselected customers' load from a power system in response to an abnormal condition to maintain the integrity of the system and minimize overall customer outages.	D2 D3 D4 D12
Local area		An electrically confined or radial portion of the system. The geographic	D1

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		size and number of system elements contained will vary based on system characteristics. A local area may be relatively large geographically with relatively few buses in a sparse system, or be relatively small geographically with a relatively large number of buses in a densely networked system.	D4
Maintenance Outage		The removal of equipment from service availability to perform work on specific elements that can be deferred, but requires the equipment be removed from service before the next planned outage. Typically, a Maintenance Outage may occur anytime during the year, have a flexible start date, and may or may not have a predetermined duration.	D1
Merging Unit		An intelligent electronic device (IED) that collects multichannel signals output by current transformers and voltage transformers synchronously, along with device status, control, then exchanges these signals with the protocol of IEC 61850 to protective devices and measure-control devices.	
Net Capacity		The maximum capacity (or effective rating), modified for ambient limitations, that a generating unit, power plant, or electric system can sustain over a specified period, less the capacity used to supply the demand of station service or auxiliary needs.	D1
Net Real Power Capability (of a generator or generating facility)		The Gross Real Power Capability, less the auxiliary real power loads necessary to operate the generator at maximum real power output.	D9
Net Reactive Power Capability (of a generator or generating facility)		The Gross Reactive Power Capability adjusted for any applicable losses and auxiliary loads incurred up to the point of interconnection and at a specified Gross Real Power output for a specific seasonal capability period.	D10

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Normal Fault Clearing		Fault clearing consistent with correct operation of the protection system and with the correct operation of all circuit breakers or other automatic switching devices intended to operate in conjunction with that protection system .	D1
Normal (Precontingency) Operating Procedures		Operating procedures that are normally invoked by the system operator to alleviate potential facility overloads or other potential system problems in anticipation of a contingency .	D1 (Appendix F)
Normal Transfer Capability		The amount of power transfer allowed between Areas or within an Area when operating to meet NPCC normal criteria contingencies [as defined in Directory #1].	D1 D2
Operating Capability		The maximum load carrying ability of generating equipment or other electrical apparatus under specified conditions for a given time interval.	D9
Operating Limit		The maximum value of the most critical system operation parameter(s) which meet(s): (a) pre- contingency criteria as determined by equipment loading capability and acceptable voltage conditions; (b) stability criteria; (c) post- contingency loading and voltage criteria.	D1 (Appendix C) D2 D5
Operating Capacity		The capacity claimed for any generating source recognizing any temporary deratings, governor load limits, proven maximum loading rates, starting times and equipment limitations including transmission operating limits .	D5
Operating Procedures		A set of policies, practices, or system adjustments that may be automatically or manually implemented by the system operator within a specified time frame to maintain the operational integrity of the interconnected electric systems.	D1 D5 D7
Operating Reserve		The sum of ten-minute and thirty-minute reserve.	D1 D2
Phase Shifting Transformer		A transformer that advances or retards the phase angle relationship of one circuit with respect to another to control power flow.	D1 D2 D4

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		Synonyms: Phase angle regulator, phase shifter.	
Pilot Protection		A form of line protection that uses a communication channel as a means to compare electrical conditions at the terminals of a line.	D4
Planned Outage		Removing the equipment from service availability for inspection and/or general overhaul of one or more major equipment groups. This outage usually is scheduled well in advance.	D1
Pole (HVdc term)		A rectifier and an inverter, with associated filter banks and control equipment, tied together by a transmission line or bus.	D1
Power		See definitions for Real Power, Reactive Power and Apparent Power.	D8
Power Swing		A transient change in the power flows on a system, usually of an oscillatory nature.	D1 D4 (Appendix A)
Process Bus		IEC 61850 addresses this need through the definition of Sampled Measured Values services and the implementation of a Process Bus . The Process layer of the substation is related to gathering information, such as voltage, current, and status information, from the transformers and transducers connected to the primary power system.	
Protected element		The power system element protected by the subject protection system . Examples: Line, bus, transformer, generator.	D4
Protection		The provisions for detecting power system faults or abnormal conditions and taking appropriate automatic corrective action.	D1 D2 D3 D4 D7

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Protection group		<p>A fully integrated assembly of protective relays and associated equipment that is designed to perform the specified protective functions for a power system element, independent of other groups.</p> <p><u>Notes:</u></p> <p>(a) Variously identified as Main Protection, Primary Protection, Breaker Failure Protection, Back-Up Protection, Alternate Protection, Secondary Protection, A Protection, B Protection, Group A, Group B, System 1 or System 2.</p> <p>(b) Pilot protection is considered to be one protection group.</p>	<p>D1 D3 D4 D7</p>
Protection System		<p><u>Element Basis</u></p> <p>One or more protection groups; including all equipment such as instrument transformers, station wiring, circuit breakers and associated trip/close modules, and communication facilities; installed at <u>all terminals</u> of a power system element to provide the complete protection of that element.</p> <p><u>Terminal Basis</u></p> <p>One or more protection groups, as above, installed at <u>one</u> terminal of a power system element, typically a transmission line.</p>	<p>D1 D3 D4 D7</p>
Protective relay		<p>A relay that detects a power system fault or abnormal condition and initiates appropriate control system action.</p>	<p>D3 D4</p>
Rating		<p>The operational limits of an electric system, facility, or element under a set of specified conditions.</p>	<p>D1 D5</p>

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Reactive Power		The portion of electricity that establishes and sustains the electric and magnetic fields of alternating-current equipment. Reactive power must be supplied to most types of magnetic equipment, such as motors and transformers. It also must supply the reactive losses on transmission facilities. Reactive power is provided by generators, synchronous condensers , or electrostatic equipment such as capacitors. Reactive power directly influences electric system voltage. It is usually expressed in kilovars (kVAr) or megavars (MVar).	D1 D2 D10
Real Power		The rate of producing, transferring, or using electrical energy, usually expressed in kilowatts (kW) or megawatts (MW).	D1 D2 D9 D10
Reclosing		<p>Autoreclosing — The automatic closing of a circuit breaker in order to restore an element to service following automatic tripping of the circuit breaker. Autoreclosing does not include automatic closing of capacitor or reactor circuit breakers.</p> <p>High-speed autoreclosing — The autoreclosing of a circuit breaker after a necessary time delay (less than one second) to permit fault arc deionization with due regard to coordination with all relay protective systems. This type of autoreclosing is generally not supervised by voltage magnitude or phase angle.</p> <p>Manual Reclosing — The closing of a circuit breaker by operator action after it has been tripped by protective relays. Operator initiated closing commands may originate from local control or from remote (supervisory) control. Either local or remote close commands may be supervised or unsupervised.</p>	D1

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		<p>Supervision — A closing command is said to be supervised if closing is permitted to occur only if certain prerequisite conditions are met (e.g., synchronism-check).</p> <p>Synchronism-check — refers to the determination that acceptable voltages exist on the two sides of the breaker and the phase angle between them is within a specified limit for a specified time.</p>	
Regional Reserve Deficiency		When two or more Areas are deficient in ten minute reserve after all Area coordinated actions have been deployed, including acquiring emergency energy and/or capacity but excluding the shedding of firm load.	D5
Relay		An electrical device designed to respond to input conditions in a prescribed manner and after specified conditions are met to cause contact operation or similar abrupt change in associated electric control circuits. (Also: see protective relay).	D1 D3 D4 D7 D12
Reliability		<p>The degree of performance of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply. Electric system reliability can be addressed by considering two basic and functional aspects of the electric system — Adequacy and Security.</p> <p>Adequacy — The ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.</p> <p>Security — The ability of the electric system to withstand disturbances such as electric short circuits or unanticipated loss of system elements.</p>	D1 D2 D5 D9 D10
Reportable Events		System disturbances involving losses of load, generation or transmission	D5

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		facilities within NPCC Control Areas which equal or exceed the following criteria are reportable events: (1) Actual net interchange deviations equal to or greater than 500 MW (Maritime: 300 MW). (2) Loss of generation or load equal to or greater than 500 MW (Maritime: 300 MW). (3) System frequency deviations equal to or greater than 0.03 Hz (Hydro-Quebec: 0.5 Hz). (System frequency deviations that occur for events outside of the NPCC are reported for analysis of frequency response, but are not included in the reporting for the NERC Disturbance Control Standard.)	
Reserve		In normal usage, reserve is the amount of capacity available in excess of the demand	D1 D2 D5
Reserve on Automatic Generation Control (AGC)		That portion of synchronized reserve which is under the command of an automatic controller to respond to load without need for manual action.	D5
Reserve Requirement		That capability above firm system demand required to provide for regulation, load forecasting error, equipment forced and scheduled outages, and local area supply adequacy.	D2 D5
Resource		Resource refers to the total contributions provided by supply-side and demand -side facilities and/or actions. Supply-side facilities include utility and non-utility generation and purchases from neighboring systems. Demand -side facilities include measures for reducing load , such as conservation, demand management, and interruptible load .	D1 D2 D5 D8 D9 D10
Scheduled Interchange		The algebraic sum of all Interchange Schedules across a given path or between Balancing Authorities for a given period or instant in time.	D5

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		(Source: Net Scheduled Interchange defined in NERC Glossary of Terms)	
Second Contingency Loss		The largest capacity outage which would result from the loss of a single element after allowing for the First Contingency Loss.	D5
Short Circuit		An abnormal connection (including an arc) of relatively low impedance, whether made accidentally or intentionally, between two points of different potential. <i>Note:</i> The term fault or short-circuit fault is used to describe a short circuit.	D4 D7
Short Time Emergency Rating	STE	The maximum loading of electrical equipment which can be sustained for 15 minutes based on nominal ambient conditions and recognizing preloading conditions.	D1 (Appendix C)
Significant Adverse Impact		<p>With due regard for the maximum operating capability of the affected systems, one or more of the following conditions arising from faults or disturbances, shall be deemed as having significant adverse impact:</p> <ul style="list-style-type: none"> a. instability; <ul style="list-style-type: none"> • any instability that cannot be demonstrably contained to a well-defined local area. • any loss of synchronism of generators that cannot be demonstrably contained to a well-defined local area b. unacceptable system dynamic response; <ul style="list-style-type: none"> • an oscillatory response to a contingency that is not demonstrated to be clearly positively damped within 30 seconds of the initiating event. c. unacceptable equipment tripping <ul style="list-style-type: none"> • tripping of an un-faulted bulk power system element (element that has already been classified as bulk power system) under planned 	D1 (Appendix E) D5

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		<p>system configuration due to operation of a protection system in response to a stable power swing</p> <ul style="list-style-type: none"> • operation of a Type I or Type II Special Protection System in response to a condition for which its operation is not required <p>d. voltage levels in violation of applicable emergency limits;</p> <p>e. loadings on transmission facilities in violation of applicable emergency limits.</p>	
Single Contingency		A single event, which may result in the loss of one or more elements .	D5
Special Protection System	SPS	<p>Special Protection System (SPS) – A protection system designed to detect abnormal system conditions and take corrective action other than the isolation of faulted elements. Such action may include changes in load, generation, or system configuration to maintain system stability, acceptable voltages or power flows.</p> <p>However, the following are not considered SPS's:</p> <ul style="list-style-type: none"> -Automatic underfrequency load shedding; -Automatic under voltage load shedding, and -Manual or automatic locally controlled shunt devices. 	D1 D3 D4 (Appendix A) D7

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Term	Acronym	Definition	Directories that use this term
Stability		The ability of an electric system to maintain a state of equilibrium during normal and abnormal conditions or disturbances. (Source: NERC Glossary of Terms)	D1 D4
Static Var Compensator	SVC	A combination of controlled shunt reactors and switched capacitor banks, used to affect the reactive power flow of the system or to regulate the system voltage.	D1 (Appendix G) D2 D4
Synchronize		The process of connecting two previously separated alternating current apparatuses or systems after matching frequency, voltage, phase angles, etc. (e.g., paralleling a generator to the electric system).	D8
Synchronized Reserve		The unused portion of generating capacity which is synchronized to the system and ready to pick up load to claimed capacity and capacity which can be made available by curtailing pumping hydro units.	D5
Synchronous Condenser		A synchronous machine which operates without mechanical load to supply or absorb reactive power for voltage control purposes.	D2 D10
System Disturbance		An event characterized by one or more of the following phenomena: the loss of power system stability ; cascading outages of circuits; oscillations; abnormal ranges of frequency or voltage or both.	D1 D2 D4 D5 D7
System Operator		An individual at a control center (Balancing Authority, Transmission Operator, Generator Operator, Reliability Coordinator) whose responsibility it is to monitor and control that electric system in real time. (Source: NERC Glossary of Terms)	D2 D3 D8

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Teleprotection		A form of protection that uses a communication channel.	D4 D7
Ten-Minute Reserve		The sum of synchronized and non- synchronized reserve that is fully available in ten minutes.	D1 D5
Thirty-Minute Reserve		The sum of synchronized and non- synchronized reserve that can be utilized in thirty minutes, excluding capacity assigned to ten-minute reserve .	D5
Tie Line		A circuit connecting two Balancing Authority Areas.	D1 D2 (Appendix B) D5
Tie Line Bias		A mode of operation under automatic generation control in which the area control error is determined by the actual net interchange minus the biased scheduled net interchange .	D2
Total Transfer Capability	TTC	The amount of electric power that can be transferred over the interconnected transmission network in a <i>reliable</i> manner based on <i>all</i> of the following conditions: <ol style="list-style-type: none"> 1. For the existing or planned system configuration, and with normal (precontingency) operating procedures in effect, all facility loadings are within normal ratings and all voltages are within normal limits. 2. The electric systems are capable of absorbing the dynamic power swings, and remaining stable, following a disturbance that results in the loss of any single electric system element, such as a transmission line, transformer, or generating unit. 3. After the dynamic power swings subside following a disturbance that results in the loss of any single electric system element as described in 2 above, and after the operation of any automatic operating systems, but before any post-contingency operator-initiated system adjustments 	D5

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Term	Acronym	Definition	Directories that use this term
		<p>are implemented, all transmission facility loadings are within emergency ratings and all voltages are within emergency limits</p> <p>4. With reference to condition 1 above, in the case where precontingency facility loadings reach normal thermal ratings at a transfer level below that at which any first contingency transfer limits are reached, the transfer capability is defined as that transfer level at which such normal ratings are reached.</p> <p>5. In some cases, individual system, power pool, subregional, or Regional planning criteria or guides may require consideration of specified multiple contingencies, such as the outage of transmission circuits using common towers or rights-of-way, in the determination of transfer capability limits. If the resulting transfer limits for these multiple contingencies are more restrictive than the single contingency considerations described above, the more restrictive reliability criteria or guides must be observed.</p>	
Transfer Capability		<p>The measure of the ability of interconnected electric systems to move or transfer power in a reliable manner from one area to another over all transmission lines (or paths) between those areas under specified system conditions. The units of transfer capability are in terms of electric power, generally expressed in megawatts (MW). The transfer capability from “Area A” to “Area B” is not generally equal to the transfer capability from “Area B” to “Area A.”</p> <p>(Source: NERC Glossary of Terms)</p>	D1 D2 D5
Transient Stability		<p>The ability of an electric system to maintain synchronism between its parts when subjected to a disturbance and to regain a state of equilibrium following that disturbance.</p>	D1
Verified Capability (of a		<p>The capability as demonstrated by the methods specified in NPCC</p>	D9

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Term	Acronym	Definition	Directories that use this term
generator or generating facility)		Directories and accepted by the Transmission Operator.	D10
Voltage Reduction		A means to reduce the demand by lowering the customer's voltage.	D1 D2 (Appendix B) D5 (Appendix 3)
Voltage Regulating Transformer		A transformer that increases or decreases the voltage magnitude relationship of one circuit with respect to another, most often used to control voltage but also to control reactive power flow.	D1
With Due Regard To Reclosing		This phrase means that before any manual system adjustments, recognition will be given to the type of reclosing (i.e., manual or automatic) and the kind of protection .	D1

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Term	Acronym	Definition	Documents that use this term
Automatic Operating Systems		Special protection systems , remedial action schemes, or other operating systems installed on the electric systems that require <i>no intervention</i> on the part of system operators .	
Auto-reclosing		The automatic closing of a circuit breaker in order to restore an element to service following automatic tripping of the circuit breaker. Auto-reclosing does not include automatic closing of capacitor or reactor circuit breakers.	
Available Transfer Capability	ATC	A measure of the transfer capability remaining in the physical transmission network for further commercial activity over and above already committed uses. ATC is defined as the Total Transfer Capability (TTC), less the Transmission Reliability Margin (TRM) , less the sum of existing transmission commitments (which includes retail customer service) and the Capacity Benefit Margin (CBM) .	
Availability		A measure of time a generating unit, transmission line, or other facility is capable of providing service, whether or not it actually is in service. Typically, this measure is expressed as a percent available for the period under consideration.	
Average Demand		The electric energy delivered over any interval of time as determined by dividing the total energy by the units of time in the interval.	
Base load Capacity		Capacity used to serve an essentially constant level of customer demand . Base load generating units typically operate whenever they are available.	
Billing Demand		The demand upon which customer billing is based as specified in a rate schedule or contract. It may be based on the contract year, a contract minimum, or a previous maximum and, therefore, does not necessarily coincide with the actual measured demand of the billing period.	
Bottled Energy/Power/Capacity		Energy/Power/Capacity which is available at the source but which cannot be delivered to the point of use because of restrictions in the transmission	

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Term	Acronym	Definition	Documents that use this term
		system. Also referred to as Locked-In Energy/Power/Capacity.	
Capacity Benefit Margin	CBM	CBM is defined as that amount of transmission transfer capability reserved by load serving entities to ensure access to generation from interconnected systems to meet generation reliability requirements.	
Coincident Demand		The sum of two or more demands that occur in the same demand interval.	
Contingency Reserve Adjustment Factor		A factor used in determining the additional ten-minute reserve that each Area , not meeting the DCS requirement for a given quarter, must carry. It is calculated using the following formula: $CRA_{quarter} = 2 - \{ \text{the average percentage DCS (expressed as a decimal) for the quarter of measurement} \}$	
Continuous Rating		The rating – as defined by the equipment owner – that specifies the level of electrical loading, usually expressed in megawatts (MW) or other appropriate units that a system, facility, or element can support or withstand indefinitely without loss of equipment life. (Normally not used in NPCC)	
Contract Demand		The amount of capacity that a supplier agrees to make available for delivery to a particular entity and which the entity agrees to purchase.	
Control Area		An electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its net interchange schedule with other Control Areas and contributing to frequency regulation of the Interconnection .	
Demand Interval		The time period during which electric energy is measured, usually in 15-, 30-, or 60-minute increments.	

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Double Element Contingency		A contingency involving the loss of two elements .	
Emergency Rating		The rating – as defined by the equipment owner – that specifies the level of electrical loading, usually expressed in megawatts (MW) or other appropriate units, that a system, facility, or element can support or withstand for a finite period. The rating assumes acceptable loss of equipment life or other physical or safety limitations for the equipment involved.	
Firm Demand		That portion of the Contract Demand that a power supplier is obligated to provide except when system reliability is threatened or during emergency conditions.	
First Contingency Incremental Transfer Capability	FCITC	<p>The amount of power, incremental above normal base power transfers, that can be transferred over the transmission network in a reliable manner based on the following conditions:</p> <ol style="list-style-type: none"> 1. For the existing or planned system configuration, and with normal (pre-contingency) operating procedures in effect, all facility loadings are within normal ratings and all voltages are within normal limits. 2. The electric systems are capable of absorbing the dynamic power swings, and remaining stable, following a disturbance that results in the loss of any single electric element, such as a transmission line, transformer, or generating unit. 3. After the dynamic power swings subside following a disturbance that results in the loss of any single electric system element as described in 2 above, and after the operation of automatic operating systems, but before any post-contingency operator-initiated system adjustments are implemented, all transmission facility loadings are within emergency 	

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		<p>ratings and all voltages are within emergency limits.</p>	
<p>First Contingency Total Transfer Capability</p>	<p>FCTTC</p>	<p>The algebraic sums of the FCITC values and the appropriate total interregional transfers assumed in the base load flow model used for the FCITC calculations.</p>	
<p>Forced Outage Rate</p>		<p>The hours a generating unit, transmission line, or other facility is forced out of service, divided by the sum of the hours it is removed from service, plus the total number of hours the facility was connected to the electricity system expressed as a percent.</p>	
<p>Harmonic Current</p>		<p>A periodic component of current having a frequency that is an integral multiple of that currents fundamental frequency. Harmonic currents are normally measured in amperes or in percent of the fundamental frequency current, generally at specific frequencies, such as second and third harmonics. Harmonic currents can, for example, be generated by HVdc converters, Static Var Compensators (SVC) and geomagnetically induced currents (GIC).</p>	
<p>High Speed Fault Clearing</p>		<p>Fault clearing consistent with correct operation of high-speed relays and the associated circuit breakers without intentional time delay. <i>Notes:</i> The specified time for high-speed relays in present practice is 50 milliseconds (three cycles on a 60Hz basis) or less. [IEEE C37.100-1981]. For planning purposes, a total clearing time of six cycles or less is considered high speed.</p>	
<p>High-Speed Auto reclosing</p>		<p>The auto reclosing of a circuit breaker after a necessary time delay (less than one second) to permit fault arc deionization with due regard to coordination with all relay protective systems. This type of auto reclosing is generally not supervised by voltage magnitude or phase angle.</p>	
<p>Integrated Demand</p>		<p>The average of the instantaneous demands over the demand interval.</p>	

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Interchange Scheduling		The actions taken by scheduling entities to arrange transfer of electric power . The schedule consists of an agreement on the amount, start and end times, ramp rate, and degree of firmness.	
Instantaneous Demand		The rate of energy delivered at a given instant.	
Limiting Contingency		The contingency which establishes the transfer capability .	
Load Cycle		The normal pattern of demand over a specified time period associated with a device or circuit.	
Long Time Emergency (LTE) Rating		The maximum rating of electrical equipment based on nominal ambient conditions and recognizing the nominal load cycle for a long period such as 24 hours.	
Manual Reclosing		The closing of a circuit breaker by operator action after it has been tripped by protective relays . Operator initiated closing commands may originate from local control or from remote (supervisory) control. Either local or remote close commands may be supervised or unsupervised.	
Negative Shared Activation Reserve Energy		Energy received by an assisting Area from a contingent Area for an eligible resource loss having a concurrent effective loss of demand that exceeds the loss of energy from the resource loss, and is implemented at a zero time ramp rate immediately following allocation notification, maintained until the Contingent Area requests a return to normal but not longer than thirty minutes, and ramped out at a ten-minute ramp rate following communications initiated by the Contingent Area which have resulted in mutually established interchange schedules .	
Non coincident Demand		The sum of two or more demands that occur in different demand intervals.	
Non recallable Available Transfer Capability	NATC	Total Transmission Capability less the Transmission Reliability Margin , less non recallable reserved transmission service (including the Capacity Benefit Margin).	
Non-Synchronized Reserve		That portion of operating capacity , which is available for synchronizing to	

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		the network and that capacity which can be made available by applying load management techniques such as curtailing interruptible loads or implementing voltage reductions .	
Normal Incremental Transfer Capability	NITC	The amount of electric power , incremental above normal base power transfers, that can be transferred between two areas of the interconnected transmission systems under conditions where pre- contingency loadings reach the normal thermal rating of a facility prior to any first contingency transfer limits being reached. When this occurs, NITC replaces FCITC as the most limiting transfer capability.	
Normal Rating		The rating – as defined by the equipment owner – that specifies the level of electrical loading, usually expressed in megawatts (MW) or other appropriate units that a system, facility, or element can support or withstand through the daily demand cycles without loss of equipment life.	
NPCC Emergency Criteria Contingencies		The set of contingencies to be observed when operating the bulk power system under emergency conditions.	
NPCC Normal Criteria Contingencies		The set of contingencies to be observed when operating the bulk power system under normal conditions.	
Peak Demand		The highest electric power requirement occurring in a given period (e.g., an hour, a day, month, season, or year). For an electric system, it is equal to the sum of the metered net outputs of all generators within a system and the metered line flows into the system, less the metered line flows out of the system.	
Peaking Capacity		Capacity used to serve peak demand . Peaking generating units operate a limited number of hours per year, and their capacity factor is normally less than 20%.	
Permanent Fault		A fault which prevents the affected element from being returned to service until physical actions are taken to effect repairs or to remove the cause of the fault.	

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Term	Acronym	Definition	Documents that use this term
Pole (of an ac switching device)		That portion of the device associated exclusively with one electrically separated conducting path of the main circuit of the device.	
Post contingency Operating Procedures		Operating procedures that may be invoked by the system operator to mitigate or alleviate system problems after a contingency has occurred.	
Power		Apparent Power — The product of the volts and amperes. It comprises both <i>real</i> and <i>reactive</i> power, usually expressed in kilo volt amperes (kVA) or megavoltamperes (MVA).	
Power Pool		Two or more interconnected electric systems operated and/or planned to supply power for their combined demand requirements.	
Recallable Available Transmission Capability	RATC	Total Transmission Capability less the Transmission Reliability Margin , less recallable transmission service, less non-recallable transmission service (including the Capacity Benefit Margin).	
Reclosing <i>This term by itself is not defined in the NPCC glossary.</i>		<i>Need to develop this definition.</i>	
Regional Reserve Sharing		Procedure that allows participating Areas to reduce the requirement for reserve within its Area due to the availability and deliverability of reserve from other Areas .	
Regional Reserve Sharing Energy		Energy delivered to a contingent Area from assisting Areas that is converted from delivered Shared Activation Reserve Energy after the Shared Activation Reserve Energy has been delivered for 30 minutes; maintained until the Contingent Area requests a return to normal but not longer than sixty minutes, and ramped out at a ten-minute ramp rate following communications initiated by the Contingent Area which have resulted in mutually established interchange schedules .	
Shared Activation Reserve Energy		Energy delivered from an assisting Area to a contingent Area that is implemented at a zero time ramp rate immediately following allocation	

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		notification, maintained until the Contingent Area requests a return to normal but not longer than thirty minutes, and ramped out at a ten-minute ramp rate following communications initiated by the Contingent Area which have resulted in mutually established interchange schedules .	
Single Element Contingency		A contingency involving the loss of one element .	
Small-Signal Stability		The ability of the electric system to withstand small changes or disturbances without the loss of synchronism among the synchronous machines in the system.	
Stability Limit		See NERC definition.	
Supervision		A closing command is said to be supervised if closing is permitted to occur only if certain prerequisite conditions are met (e.g., synchronism-check).	
Supervisory Control		A form of remote control comprising an arrangement for the selective control of remotely located facilities by an electrical means over one or more communications media.	
Surge		See NERC definition.	
Synchronism-check		Refers to the determination that acceptable voltages exist on the two sides of the breaker and the phase angle between them is within a specified limit for a specified time.	
Synchronism-check Relay		A verification relay whose function is to operate when two input voltages satisfy predetermined operating parameters.	
Transient Fault		A fault which occurs for a short or limited time, or which disappears when the faulted element is separated from all electrical sources and which does not require repairs to be made before the element can be returned to service either manually or automatically.	

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Term	Acronym	Definition	Documents that use this term
Transmission Reliability Margin	TRM	TRM is defined as that amount of transmission transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions.	
Wheeling		The contracted use of electrical facilities of one or more entities to transmit electricity for another entity.	