N

n (1) When preceding a capitalized signal name, denotes a signal having negative true logic. (C/MM) 1284-1994

(2) A multiplier having integer values (e.g., 0, 1, 2, 3. . .). (C/BA) 1301.4-1996

(3) *See also:* access; nano. (C) 610.10-1994w

n Multiplier having integer values of 1, 2, 3, . . . (C/BA/MM) 1301.2-1993, 1301.3-1992r

NA *See:* laser gyro axes; numerical aperture.

n–address instruction (-address instruction) A computer instruction that contains *n* address fields, where *n* may be any non-negative integer. *Contrast: n*–plus-one address instruction. *See also:* two-address instruction; one-address instruction. (C) 610.12-1990

n-address instruction format An instruction format that specifies n address fields, referencing n storage locations. For example, a "three-address instruction" contains three addresses. (C) 610.10-1994w

***n*–adic** *See:* N–ary.

n–adic Boolean operation (-adic boolean operation) A Boolean operation involving exactly *n* operands. *See also:* monadic Boolean operation; dyadic Boolean operation. (C) 1084-1986w

NAK *See:* negative acknowledge character.

name (1) (data management) An alphanumeric term that identifies a data item such as a field, record, or file. (C) 610.5-1990w

(2) The language-independent syntax for an identifier used to represent a specific value of a specific datatype. When a name is bound to its value is not specified: at compile time, link time, or load time. The use of a name as a parameter in a datatype specification does not imply that its value is defined at compile time. (C/PA) 1351-1994w

(3) In the shell command language, a word consisting solely of underscores, digits, and alphabetics from the portable character set. The first character of a name shall not be a digit. (C/PA) 9945-2-1993

(4) A construct that singles out a particular (directory) object from all other objects. A name shall be unambiguous (that is, denote just one object); however, it need not be unique (that is, be the only name that unambiguously denotes the object). (C/PA) 1328.2-1993w, 1224.2-1993w, 1327.2-1993w, 1326.2-1993w

(5) An identifier used to represent a specific value of a specific datatype. This Standard does not specify when a name is bound to its value: at compile time, link time, or load time. The use of a name as a parameter in a datatype specification does not imply that its value is defined at compile time. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w, 1224.1-1993w

(6) A word or phrase that designates some model construct (such as a class, responsibility, subject domain, etc.). (C/SE) 1320.2-1998

(7) An indexical term used by humans as a means of identifying data elements and other data concepts. (SCC32) 1489-1999

named constraint A constraint that is specific to a particular model, rather than being inherent in some modeling construct (such as a cardinality constraint.). A named constraint is explicitly named, its meaning is stated in natural language, and its realization is written in the specification language. (C/SE) 1320.2-1998

Named Tag Set A field containing a Tag Set Name and its associated set of security tags. (C/LM) 802.10g-1995

nameplate (rotating machinery) (rating plate) A plaque giving the manufacturer's name and the rating of the machine. (PE) [9]

name service A service that assigns names that are unique within the name space, and that can translate a unique name into the location of the named entity. (C/PA) 1003.2d-1994

name space The environment within which a name is known to be unique. (C/PA) 1003.2d-1994

NaN *See:* not a number.

NAND (mathematics of computing) A Boolean operator having the property that if P is a statement, Q is a statement, R is a statement, . . ., then the NAND of P, Q, R, . . . is true if and only if at least one statement is false. *Note:* The NAND of P and Q is often represented by $\overline{PQ}$.

NAND Truth Table

P	Q	$\overline{PQ}$
0	0	1
0	1	1
1	0	1
1	1	0

Synonyms: Sheffer stroke; nonconjunction. (C) 1084-1986w

NAND element *See:* NAND gate.

NAND gate A gate that performs the Boolean operation of nonconjunction. *Note:* NAND is synonymous with NOT-AND. *Synonyms:* IF-A-THEN-NOT-B gate; NAND element. (C) 610.10-1994w

nano A prefix indicating 10^{-9}. (C) 1084-1986w

nanocode A collection of nanoinstructions. *Synonym:* nanoprogram. (C) 610.10-1994w, 610.12-1990

nanoinstruction (1) (software) In a two-level implementation of microprogramming, an instruction that specifies one or more of the basic operations needed to carry out a microinstruction. (C) 610.12-1990

(2) In a two-level implementation of multiprogramming, an instruction that specifies one or more of the basic operations needed to carry out a microinstruction. (C) 610.10-1994w

nanoprogram *See:* nanocode.

nanostore (software) In a two-level implementation of microprogramming, a secondary control store in which nanoinstructions reside. (C) 610.12-1990

narrative information (data management) Information that is presented according to the syntactic order of a natural language. *Contrast:* formatted information. (C) 610.5-1990w

narrative model A symbolic model whose properties are expressed in words; for example, a written specification for a computer system. *Synonym:* verbal-descriptive model. *Contrast:* mathematical model; software model; graphical model. (C) 610.3-1989w

narrow-angle diffusion (illuminating engineering) That in which flux is scattered at angles near the direction which the flux would take by regular reflection or transmission. (EEC/IE) [126]

narrow angle luminaire (illuminating engineering) A luminaire which concentrates the light within a cone of comparatively small solid angle. (EEC/IE) [126]

narrow-band axis (color television) (phasor representation of the chrominance signal) The direction of the phasor representing the coarse chrominance primary. (BT/AV) 201-1979w, [34]

narrow-band electrical noise A disturbance at a single frequency or in a narrowband of frequencies about a single frequency. (PE/IC) 1143-1994r

narrow-band interference For purposes of measurement, a disturbance of spectral energy lying within the bandpass of the measuring receiver in use. *See also:* electromagnetic compatibility. (EMC) [53]

narrow-band radio noise Radio noise having a spectrum exhibiting one or more sharp peaks, narrow in width compared

to the nominal bandwidth of, and far enough apart to be resolvable by, the measuring instrument (or the communication receiver to be protected). (EMC) C63.4-1988s

narrow-band response spectrum (seismic qualification of Class 1E equipment for nuclear power generating stations) A response spectrum that describes the motion in which amplified response occurs over a limited (narrow) range of frequencies. (PE/NP) 344-1987r

narrow-band spurious emission (land-mobile communications transmitters) Any spurious output emitted from a radio transmitter, other than on its assigned frequency, which produces a disturbance of spectral energy lying within the bypass of the measuring receiver in use. (EMC) 377-1980r

N–ary (1) (A) (software) Characterized by a selection, choice or condition that has *n* possible different values or states. **(B) (software)** Of a fixed radix numeration system, having a radix of *n*. (C/SE) 729-1983

(2) A code whose output alphabet consists of N symbols. (IT) [123]

n–ary (A) (mathematics of computing) Pertaining to a selection in which there are *n* possible outcomes. **(B) (mathematics of computing)** Pertaining to a numeration system with a radix of *n*. (C) 1084-1986

n–ary Boolean operation* **(–ary relation)** A relation with *n* attributes in each tuple. (C) 610.5-1990w

* Deprecated.

n-ary tree (–ary tree) A tree of order *n*; for example, an 8-ary tree. *See also:* octary tree; binary tree; multiway tree. (C) 610.5-1990w

Nassi-Shneiderman chart *See:* box diagram.

nat *See:* nit.

national call (telephone switching systems) A toll call to a destination outside of the local service area of the calling customer but within the boundaries of the country in which he or she is located. (COM) 312-1977w

national character (data management) Deprecated term for the characters #,@, and $. (C) 610.5-1990w

national distance dialing (telephone switching systems) The automatic establishing of a national call by means of signals from the calling device of either a customer or an operator. (COM) 312-1977w

National Electrical Code dimensions (protection and coordination of industrial and commercial power systems) Dimensions once stated in the National Electrical Code (NEC), but now found in ANSI/UL 198B-1982 and in ANSI/UL 198D-1982. These dimensions are common to Class H and K fuses and provide interchangeability between manufacturers for fuses and fusible equipment of a given ampere and voltage range. (IA/PSP) 242-1986r

National Institute for Standards and Technology (NIST) The US federal agency with legally mandated authority to maintain national physical standards for the activity of radionuclides (formerly US National Bureau of Standards, NBS). (NI) N42.22-1995

national number (telephone switching systems) The combination of digits representing an area code and a directory number that, for the purpose of distance dialing, uniquely identifies each main station within each of the world's geographical areas that is identified by a country code. (COM) 312-1977w

national-numbering plan (telephone switching systems) Any plan for identifying telephone stations within a geographical area identified by a unique country code. (COM) 312-1977w

national numbering-plan area (telephone switching systems) A geographical area of the world where a country code and the national boundaries are related uniquely. (COM) 312-1977w

national radioactivity standard source (germanium detectors) A calibrated radioactive source prepared and distributed as a standard reference material by the U.S. National Bureau of Standards. (PE/EDPG) 485-1983s

national standard (plutonium monitoring) An instrument source or other system or device maintained and promulgated as such by the United States National Bureau of Standards. (NI) N317-1980r

national standards (metering) Those standards of electrical measurements that are maintained by the National Bureau of Standards. (ELM) C12.1-1982s

National Television Standards Committee (NTSC) A standards-setting body for the television and video industries in the United States. (C) 610.10-1994w

nationwide toll dialing (telephony) A system of automatic switching whereby an outward toll operator can complete calls to any basic-numbering-plan area in the country covered by the system. (EEC/PE) [119]

native data type (data management) A data type that is built into a software or hardware system. (C) 610.5-1990w

native system demand (power operations) The net 60 min clock-hour peak integrated demand within the system less interruptible loads. *See also:* alternating-current distribution. (PE/PSE) 858-1987s, 346-1973w

NATURAL A database manipulation language used to access data stored in an ADABAS database. (C) 610.13-1993w

natural air cooling system (thyristor controller) A cooling system in which the heat is removed from the cooling surfaces of the thyristor controller components only by the natural action of the ambient air. (IA/IPC) 428-1981w

natural bandwidth (laser maser) The linewidth of an absorption or emission line when spontaneous emission is the dominant process determining spectral distribution. (LEO) 586-1980w

natural binary *See:* binary.

natural frequency (1) (surge arresters) The frequency or frequencies at which the circuit will oscillate if it is free to do so. (PE) [8], [84]

(2) The frequency or frequencies at which a body vibrates due to its own physical characteristics (mass, shape, boundary condition, and elastic restoring forces brought into play) when the body is distorted in a specific direction and then released. (SWG/PE/NP) 344-1987r, C37.81-1989r

(3) (accelerometer) (gyros) That frequency at which the output lags the input by 90°. It generally applies only to inertial sensors with approximate second-order response. (AES/GYAC) 528-1994

(4) A frequency at which a body or system vibrates due to its own physical characteristics (mass and stiffness) when the body or system is distorted and then released. (PE/SUB) 693-1997

natural language (software) A language whose rules are based on usage rather than being pre-established prior to the language's use. Examples include German and English. *Contrast:* formal language. *See also:* INTELLECT. (C) 610.12-1990, 610.13-1993w

natural linewidth (laser maser) The linewidth of an absorption or emission line when spontaneous emission is the dominant process determining spectral distribution. (LEO) 586-1980w

natural model A model that represents a system by another system that already exists in the real world; for example, a model that uses one body of water to represent another. (C) 610.3-1989w

natural noise Noise having its source in natural phenomena and not generated in machines or other technical devices. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

natural number (A) A non-negative integer: {0, 1, 2,. . . }. **(B)** A positive integer {1, 2, 3,. . . }. (C) 1084-1986, 610.5-1990

natural period The period of the periodic part of a free oscillation of the body or system. *Notes:* 1. When the period varies with amplitude, the natural period is the period as the amplitude approaches zero. 2. A body or system may have several modes of free oscillation, and the period may be different for each. (Std100) 270-1966w

natural priority The order of packet transmission of a node given that all nodes start arbitration at the same instant using the same priority level. For the cable environment, the closer a node is to the root, the higher its natural priority. For the backplane environment, the priority level and node_offset are concatenated to give its natural priority. (C/MM) 1394-1995

natural two-way merge sort (data management) A two-way merge sort in which the set to be sorted is repeatedly divided into two ordered subsets and merged, taking advantage of runs which occur naturally in the input set. *Contrast:* straight two-way merge sort. (C) 610.5-1990w

Naval Electronics Laboratory International Algorithmic Compiler (NELIAC) A programming language used primarily for solving scientific and real-time control problems. (C) 610.13-1993w

Naveam (navigation aid terms) A radio navigational warning of dangers to shipping in the Eastern, Atlantic, Mediterranean, and Red Seas. (AES/GCS) 172-1983w

navigation (navigation aid terms) The process of directing a vehicle so as to reach the intended destination. (AES/GCS) 172-1983w

navigational aid (navigation aid terms) An instrument, system, device, chart, or method intended to assist in the navigation of a vehicle. (AES/GCS) 172-1983w

navigational astronomy (navigation aid terms) That part of astronomy of direct use to a navigator, comprised principally of celestial coordinates, time, and apparent motions of celestial bodies. (AES/GCS) 172-1983w

navigational radar (surface search radar) A high-frequency radio transmitter-receiver for the detection, by means of transmitted and reflected signals, of any object (within range) projecting above the surface of the water and for visual indication of its bearing and distance. *See also:* radio direction-finder.

navigational satellite (navigation aid terms) An artificial earth orbiting satellite designed for navigational purposes. *See also:* satellite navigation. (AES/GCS) 172-1983w

navigation coordinate (navigation aid terms) Any one of a set of quantities; the set serving to define a position. (AES/GCS) 172-1983w

navigation light system (illuminating engineering) A set of aircraft aeronautical lights provided to indicate the position and direction of motion of an aircraft to pilots of other aircraft or to ground observers. (EEC/IE) [126]

navigation parameter (navigation aid terms) A measurable characteristic of motion or position used in the process of navigation. (AES/GCS) 172-1983w

navigation quantity (navigation aid terms) A measured value of a navigation parameter. (AES/GCS) 172-1983w

n-bit byte (1) A group of *n* adjacent binary digits operated upon as a unit. (C) 1084-1986w

(2) A string that consists of n bits; for example, an octet is an eight-bit byte. (C) 610.10-1994w

N/C *See:* NC.

NC *See:* not connected; numerical control.

NCAP Block An instance of the class `IEEE1451_NCAPBlock` or of a subclass thereof. (IM/ST) 1451.1-1999

n-channel device (metal-nitride-oxide field-effect transistor) Insulated-gate field-effect transistor (IGFET) where source and drain are regions of *n*-type conductivity. (ED) 581-1978w

n-channel metal-oxide semiconductor (NMOS) A type of semiconductor technology which employs a metal-oxide semiconductor device, using electrons to conduct current in the semiconductor channel. *Note:* The channel has a predominantly negative charge. *Synonym:* high-speed metal-oxide semiconductor. *Contrast:* p-channel metal-oxide semiconductor. *See also:* complementary metal-oxide semiconductor; V-channel metal-oxide semiconductor. (C) 610.10-1994w

N_char *See:* normal character.

***n*-conductor cable** *See:* multiple-conductor cable.

n-conductor concentric cable *See:* multiple-conductor concentric cable.

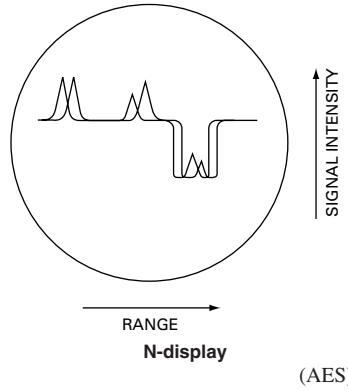
n-core-per-bit storage A type of storage in which each storage cell uses n magnetic cores per binary character, where n may be any positive integer. *See also:* one-core-per-bit storage. (C) 610.10-1994w

NCP *See:* network control program.

N-contours *See:* phase contours.

NDB *See:* nondirectional beacon.

N-display A K-display having an adjustable pedestal, notch, or step, as in the M-display, for the measurement of range. *Note:* This display is usually regarded as a variant of an A-display or a K-display rather than as a separate type.



N-display

(AES) 686-1997

NDR *See:* nondestructive read.

near end crosstalk (NEXT) (1) Crosstalk that is propagated in a disturbed channel in the direction opposite to the direction of propagation of the current in the disturbing channel. *Note:* The terminal of the disturbed channel at which the near-end crosstalk is present is ordinarily near to or coincides with the energized terminal of the disturbing channel. *See also:* coupling. (EEC/PE) [119]

(2) Crosstalk that is propagated in a distributed channel in the direction opposite to the direction of the propagation of the signal in the disturbing channel and is measured at or near the source of the disturbing signal. (LM/C) 610.7-1995, 8802-5-1998

near field The field of a source at distances that are small compared to the wavelength. *Notes:* 1. The near field includes the quasi-static and induction fields varying as r^{-3} and r^{-2}, respectively, but does not include the radiation field varying as r^{-1}. 2. Often refers to points within the Fresnel region of a large antenna. (AP/PROP) 211-1997

near-field diffraction pattern (fiber optics) The diffraction pattern observed close to a source or aperture, as distinguished from far-field diffraction pattern. *Note:* The pattern in the output plane of a fiber is called the near-field radiation pattern. *Synonym:* Fresnel diffraction pattern. *See also:* diffraction; far-field diffraction pattern; far-field region. (Std100) 812-1984w

near-field pattern *See:* radiation pattern.

near-field radiation pattern (1) Any radiation pattern obtained in the near-field of an antenna. *Note:* Near-field patterns are usually taken over paths on planar, cylindrical, or spherical surfaces. *See also:* Fresnel pattern; radiation pattern cut. (AP/ANT) 145-1993

(2) *See also:* radiation pattern.

near-field region (1) That part of space between the antenna and far-field region. *Note:* In lossless media, the near-field may be further subdivided into reactive and radiating near-field regions. (AP/ANT) 145-1993

(2) (fiber optics) The region close to a source, or aperture. The diffraction pattern in this region typically differs significantly from that observed at infinity and varies with distance from the source. *See also:* far-field region; far-field diffraction pattern. (Std100) 812-1984w

(3) That part of space between the antenna array and the far-field region. Refers to the field of a source at distances small compared to the wavelength. *Note:* The near field includes the quasi-static and induction fields varying as r-3 and r-2, respectively, but does not include the radiation field varying as r-1. (T&D/PE) 1260-1996

(4) A region generally in proximity to an antenna or other radiating structure, in which the electric and magnetic fields do not have a substantially plane-wave character, but vary considerably from point to point. The near-field region is further subdivided into the reactive near-field region, which is closest to the radiating structure and that contains most or nearly all of the stored energy, and the radiating near-field region where the radiation field predominates over the reactive field, but lacks substantial plane-wave character and is complicated in structure. *Note:* For most antennas, the outer boundary of the reactive near-field region is commonly taken to exist at a distance of one-half wavelength from the antenna surface. (NIR) C95.1-1999

near-field region, radiating *See:* radiating near-field region.

near-field region, reactive That portion of the near-field region immediately surrounding the antenna, wherein the reactive field predominates. *Note:* For a very short dipole, or equivalent radiator, the outer boundary is commonly taken to exist at a distance $\lambda/2\pi$ from the antenna surface, where λ is the wavelength. (AP/ANT) 145-1993

near-field scanning (fiber optics) The technique for measuring the index profile of an optical fiber by illuminating the entrance face with an extended source and measuring the point-by-point radiance of the exit face. *See also:* refracted ray method. (Std100) 812-1984w

near-field test point (NFTP) The acoustical measurement point located 1 cm from the center of the handsfree telephones (HFTs) loudspeaker along the axis of the speaker. (COM/TA) 1329-1999

near-letter quality (NLQ) Pertaining to printed output that is of nearly as high quality as that of a standard typewriter. *Contrast:* letter-quality; draft quality. (C) 610.10-1994w

near-side (of an SI or BI) That port of an SI or BI that is electrically closer to the originating master. (NID) 960-1993

neck (cathode-ray tubes) The small tubular part of the envelope near the base. *See also:* cathode-ray tube. (ED) [45], [84]

negate (1) To perform the logic operation NOT. (C) [20], [85]

(2) (mathematics of computing) To perform the NOT operation. (C) 1084-1986w

(3) To drive a signal or a parallel set of signals to the zero logic state. (C/BA) 1496-1993w

negation The monadic Boolean operation whose result has a Boolean value opposite to that of the operand. *See also:* NOT gate. (C) 610.10-1994w

negative Pertaining to a voltage or charge that is associated with an excess of electrons. *Contrast:* positive. (C) 610.10-1994w

negative acknowledge character (NAK) A transmission control character transmitted by a station as a negative response to the station with which the connection has been set up. (C) 610.5-1990w

negative acknowledgment A reply transmitted by a receiving station to inform the sending station that an error in data has been detected. *Contrast:* acknowledgment. (C) 610.7-1995

negative after-potential (electrobiology) Relatively prolonged negativity that follows the action spike in a homogeneous fiber group. *See also:* contact potential. (EMB) [47]

negative conductance The conductance of a negative-resistance device. (CAS) [13]

negative conductor A conductor connected to the negative terminal of a source of supply. *Note:* A negative conductor is frequently used as an auxiliary return circuit in a system of electric traction. *See also:* center of distribution. (PE/T&D) [10]

negative-differential-resistance region (thyristor) Any portion of the principal voltage-current characteristic in the switching quadrant(s) within which the differential resistance is negative. *See also:* principal voltage-current characteristic. (IA/ED) 223-1966w, [46], [12]

negative electrode (1) (primary cell) The anode when the cell is discharging. *Note:* The negative terminal is connected to the negative electrode. *See also:* electrolytic cell.

(2) (metallic rectifier) The electrode from which the forward current flows within the cell. *See also:* rectification. (PE/EEC) [119]

negative feedback (1) The process by which part of the signal in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to counteract the initial power, thereby decreasing the amplification. (CAS) [13]

(2) (control) A feedback signal in a direction to reduce the variable that the feedback represents. *See also:* feedback; feedback control system. (IA/ICTL/APP/IAC) [69], [60]

(3) (stabilized feedback) (data transmission) The process by which a part of the power in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to reduce the initial power, thereby decreasing the amplification. *Synonym:* degeneration. (PE) 599-1985w

negative glow (1) (gas tube) The luminous glow in a glow-discharge cold-cathode tube between the cathode dark space and the Faraday dark space. *See also:* gas tube. (ED) [45]

(2) (overhead-power-line corona and radio noise) Corona mode that occurs at electric field strengths above those required for Trichel streamers. Negative glow is confined to a small portion of the electrode and appears as a small, stationary, luminous bluish fan. The corona current of negative glow is essentially pulse less. *See also:* Trichel streamers. (T&D/PE) 539-1990

negative logic An electronic logic system where the voltage representing one, active, or true has a more negative value than the voltage representing zero, inactive, or false. Also known as negative-true logic, it is normally used in electronic and computing data and communications switching systems for noise immunity reasons. (IM/ST) 1451.2-1997

negative logic convention The representation of the 1-state and the 0-state by the low (L) and high (H) levels, respectively. (GSD) 91-1984r

negative matrix A matrix the surface of which is the reverse of the surface to be ultimately produced by electroforming. (EEC/PE) [119]

negative modulation (amplitude-modulation television system) That form of modulation in which an increase in brightness corresponds to a decrease in transmitted power. *See also:* television. (PE/EEC) [119]

negative-phase-sequence impedance (rotating machinery) The quotient of the negative-sequence rated-frequency component of the voltage, assumed to be sinusoidal, at the terminals of a machine rotating at synchronous speed, and the negative-sequence component of the current at the same frequency. *Note:* It is equal to the asynchronous impedance for a slip equal to 2. *See also:* asynchronous machine. (PE) [9]

negative-phase-sequence (phase-reversal) relay A relay that responds to the negative-phase-sequence component of a polyphase input quantity. *Note:* Frequently employed in three-phase systems. *See also:* relay. (SWG/PE/PSR) C37.90-1978s, C37.100-1981s

negative-phase-sequence reactance (rotating machinery) The quotient of the reactive fundamental component of negative-sequence primary voltage due to sinusoidal negative-sequence primary current of rated frequency, and the value of this current, the machine running at rated speed. *See also:* asynchronous machine. (PE/EDPG) [5]

negative-phase-sequence relay A relay that responds to the negative-phase-sequence component of a polyphase input quantity. (SWG/PE) C37.100-1992

negative phase-sequence resistance (rotating machinery) The quotient of the in-phase fundamental component of negative-sequence primary voltage, due to sinusoidal negative-sequence primary current of rated frequency, and the value of this current, the machine running at rated speed. *See also:* asynchronous machine. (PE) [9]

negative-phase-sequence symmetrical components Of an unsymmetrical set of polyphase voltages or currents of M phases, that set of symmetrical components that have the $(m - 1)$st phase sequence. That is, the angular phase lag from the first member of the set to the second, from every other member of the set to the succeeding one, and from the last member to the first, is equal to $(m - 1)$ times the characteristic angular phase difference, or $(m - 1)2\pi/m$ radians. The members of this set will reach their positive maxima uniformly but in the reverse order of their designations. *Note:* The negative-phase-sequence symmetrical components for a three-phase set of unbalanced sinusoidal voltages ($m = 3$), having the primitive period, are represented by the equations

$$e_{a2} = (2)^{1/2}E_{a2}\cos(\omega t + \alpha_{a2})$$

$$e_{b2} = (2)^{1/2}E_{a2}\cos\left(\omega t + \alpha_{a2} - \frac{4\pi}{3}\right)$$

$$e_{c2} = (2)^{1/2}E_{a2}\cos\left(\omega t + \alpha_{a2} - \frac{2\pi}{3}\right)$$

derived from the equation of symmetrical components of a set of polyphase (alternating) voltages. Since in this case, $r = 1$ for every component (of first harmonic), the third subscript is omitted. Then k is 2 for $(m$ -1)st sequence, and s takes on the algebraic values 1, 2, and 3 corresponding to phases a, b, and c. The sequence of maxima occurs in the order, a, c, b, which is the reverse or negative of the order for $k = 1$. *See also:* symmetrical components. (Std100) 270-1966w

negative-polarity lightning stroke A stroke resulting from a negatively charged cloud that lowers negative charge to the earth. *See also:* direct-stroke protection. (T&D/PE) [10]

negative pre-breakdown streamers (overhead-power-line corona and radio noise) Streamers occurring at electric field strengths close to breakdown. The discharge appears as a bright filament with very little branching and extends far into the gap. The associated current pulse has high magnitude, long duration, and low repetition rate. (PE/T&D) 539-1990

negative-resistance device A resistance in which an increase in current is accompanied by a decrease in voltage over the working range. (Std100) 270-1966w

negative-resistance oscillator An oscillator produced by connecting a parallel-tuned resonant circuit to a two-terminal negative-resistance device. (One in which an increase in voltage results in a decrease in current.) *Note:* Dynatron and transitron oscillators, arc converters, and oscillators of the semiconductor type are examples. *See also:* oscillatory circuit. (AP/BT/ANT) 145-1983s, 182A-1964w

negative-resistance repeater (data transmission) A repeater in which gain is provided by a series or a shunt negative resistance, or both. (PE) 599-1985w

negative response An input string that matches one of the responses acceptable to the LC_MESSAGES category keyword `noexpr`, matching an ERE in the current locale. (C/PA) 9945-2-1993

negative-sequence reactance The ratio of the fundamental reactive component of negative-sequence armature voltage, resulting from the presence of fundamental negative-sequence armature current of rated frequency, to this current, the machine being operated at rated speed. *Notes:* 1. The rated current value of negative-sequence reactance is the value obtained from a test with a fundamental negative-sequence current equal to rated armature current. The rated voltage value of negative-sequence reactance is the value obtained from a line-to-line short-circuit test at two terminals of the machine at rated speed, applied from no load at rated voltage, the resulting value being corrected when necessary for the effect of harmonic components in the current. 2. For any unbalanced short-circuits, certain harmonic components of current, if present, may produce fundamental reactive components of negative-sequence voltage that modify the ratio of the total fundamental reactive component of negative-sequence voltage to the fundamental component of negative-sequence current. This effect can be included by multiplying the negative-sequence reactance, before it is used for short-circuit calculations, by a wave distortion factor, equal to or less than unity, that depends primarily upon the type of short-circuit, and upon the characteristics of the machine and the external circuit, if any, between the machine and the point of short-circuit. (EEC/PE) [119]

negative-sequence resistance The ratio of the fundamental component of in-phase armature voltage, due to the fundamental negative-sequence component of armature current to this component of current at rated frequency. *Note:* This resistance, which forms a part of the negative-sequence impedance for use in circuit calculations to establish relationships between voltages and currents, is not directly applicable in the calculations of the total loss in the machine caused by negative-sequence currents. This loss is the product of the square of the fundamental component of the negative-sequence current and the difference between twice the negative-sequence resistance and the positive-sequence resistance, that is, $I_2^2\,(2R_2 - R_1)$. (EEC/PE) [119]

negative shielding angle The shielding angle formed when the shield wire is located beyond the area occupied by the outermost conductors. *See also:* positive shielding angle; shielding angle. (SUB/PE) 998-1996

negative temperature (laser maser) An effective temperature used in the Boltzmann factor to describe a population inversion. *Note:* If n_2 particles populate the higher of two states and n_1 particles populate the lower state, their ratio is conventionally expressed by the Boltzmann factor

$$\frac{n_2}{n_1} = \exp(-\mathrm{kT})$$

where k is the Boltzmann constant and T the (effective) absolute temperature. (LEO) 586-1980w

negative terminal (of a battery) The terminal toward which positive electric charge flows in the external circuit from the positive terminal. *Note:* The flow of electrons in the external circuit is to the positive terminal and from the negative terminal. *See also:* battery. (EEC/PE) [119]

negative-transconductance oscillator Oscillator in which the output of the device is coupled back to the input without phase shift, the condition for oscillation being satisfied by the negative conductance of the device. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

negative vectors Two vectors are mutually negative if their magnitudes are the same and their directions opposite. (Std100) 270-1966w

negentropy *See:* average information content, per symbol.

neighborhood (1) Of any point μ_0, in a three-dimensional space, the volume enclosed by a sphere drawn with μ_0 as center. Of any point μ_0, in a two-dimensional space, the area enclosed by a circle drawn with μ_0 as center. (Std100) 270-1966w

(2) (image processing and pattern recognition) A set of pixels located near a given pixel. (C) 610.4-1990w

neighborhood operator An image operator that assigns a gray level to each output pixel based on the gray levels in a neighborhood of the corresponding input pixel. *Contrast:* point operator. (C) 610.4-1990w

neighboring MTA An MTA with which the service is prepared to establish OSI connections in the context of the MT interface. (C/PA) 1224.1-1993w

NEITHER-NOR* *See:* NOR.

* Deprecated.

NELIAC *See:* Naval Electronics Laboratory International Algorithmic Compiler.

neon indicator A cold-cathode gas-filled tube containing neon, used as a visual indicator of a potential difference or a field. (ED) [45], [84]

neper (data transmission) A division of the logarithmic scale so that the number of nepers is equal to the natural logarithm of the scalar ratio of two currents or two voltages. *Notes:* 1. With I_1 and I_2 designating the scalar value of two currents, and n the number of nepers denoting their scalar ratio: $n\log_e(I_1/I_2)$. 2. One neper equals 0.8686 bel. 3. The neper is a dimensionless unit. (PE) 599-1985w

nerve-block (electrobiology) The application of a current to a nerve so as to prevent the passage of a propagated potential. *See also:* excitability. (EMB) [47]

NESC National Electrical Safety Code, ANSI C2-1993. (T&D/PE) 516-1995

nest (software) To incorporate a computer program construct into another construct of the same kind. For example, to nest one subroutine, block, or loop within another; to nest one data structure within another. (C) 610.12-1990

nest or section (multiple system) A group of electrolytic cells placed close together and electrically connected in series for convenience and economy of operation. *See also:* electrorefining. (EEC/PE) [119]

net (1) One complete circuit connecting at least one output to at least one input. *Note:* Must be some form of conductor such as a wire. *See also:* network. (C) 610.7-1995, 610.10-1994w

(2) An interconnection path between component pins, where the resistance of the path is not significantly different from zero. (C/TT) 1149.4-1999

net assured capability (electric power supply) The net dependable capability of all power sources available to a system, including firm power contracts and applicable emergency interchange agreements, less that reserve assigned to provide for scheduled maintenance outages, equipment and operating limitations, and forced outages of power sources. (PE/PSE) 346-1973w

net dependable capability (1) (electric power supply) The maximum generation, expressed in kilowatt hours per hour which a generating unit, station, power source, or system can be depended upon to supply on the basis of average operating conditions. (PE/PSE) 346-1973w

(2) The maximum system load, expressed in kilowatthours per hour that a generating unit, station, or power source can be depended upon to supply on the basis of average operating conditions. *Note:* This capability takes into account average conditions of weather, quality of fuel, degree of maintenance and other operating factors. It does not include provision for maintenance outages. *See also:* generating station. (T&D/PE/PSE) [10], [54]

net energy for load Net system generation plus net energy interchange. (PE/PSE) 858-1993w

net generation (electric power system) Gross generation minus station service or unit service power requirements. (PE/PSE) 858-1993w, 94-1991w

net head (power operations) The gross head less all hydraulic losses except those chargeable to the turbine. (PE/PSE) 858-1987s

net information content A measure of the essential information contained in a message. *Note:* It is expressed as the minimum number of bits or hartleys required to transmit the message with specified accuracy over a noiseless medium. *See also:* bit. (EEC/PE) [119]

net interchange (control area) (power and/or energy) The algebraic sum of the power on the tie lines of a control area. (PE/PSE) 94-1991w

net interchange deviation (electric power system) (control area) The net interchange minus the scheduled net interchange. (PE/PSE) 94-1970w

net interchange error The net actual interchange power minus the scheduled net interchange. (PE/PSE) 94-1991w

net interchange schedule programmer (speed governing systems) A means of automatically changing the net interchange schedule from one level to another at a predetermined time and during a predetermined period or at a predetermined rate. *See also:* speed-governing system. (PE/PSE) 94-1970w

netlist A point-to-point description of the interconnections between individual components in a circuit. (SCC20) 1445-1998

net load capability The maximum system load expressed in kilowatt hours per hour that a generating unit, station, or power source can be expected to supply under good operating conditions. *Notes:* 1. This capability provides for variations of load within the hour that it is assumed are to be spread among all of the power sources. 2. This is sometimes called net rated capability. *See also:* generating station. (T&D/PE/PE/PSE) [10], [54]

net loss (data transmission) (circuit equivalent) The sum of all the transmission losses occurring between the two ends of the circuit, minus the sum of all the transmission gains. (PE) 599-1985w

net rated capability *See:* net load capability.

net space charge The free, unbalanced charge in a given region, taking no account of the charges of both signs that balance each other. The preferred unit is the coulomb (C). *Note:* The term "space charge" is often used to refer to "net space charge." (T&D/PE) 539-1990, 1227-1990r

net space-charge density Net space charge (spacecharge) per unit volume. The preferred unit is C/m^3. This quantity provides no information about the monopolar space–charge density. (PE/T&D) 539-1990, 1227-1990r

net structure *See:* network structure.

net system energy (1) (power operations) Energy requirements of a system, including losses, defined as: A) net generation of the system, plus B) energy delivered to other systems. (PE/PSE) 858-1987s

(2) Energy requirements of a system, including losses, defined as A) net generation of the system, plus B) energy received from others, less C) energy delivered to other systems. (T&D/PE/PSE) 346-1973w

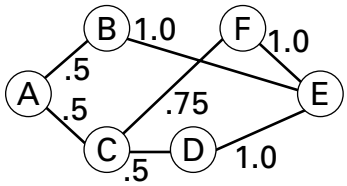
network (1) (measuring longitudinal balance of telephone equipment operating in the voice band) A combination of elements or devices. (COM/TA) 455-1985w

(2) (A) (data transmission) A series of points interconnected by communication channels. **(B) (data transmission)** The switched telephone network is the network of telephone lines normally used for dialed telephone calls. **(C) (data transmission)** A private network is a network of communications channels confined to the use of one customer. (COM/SUB/PE) 999-1992, 599-1985

(3) (A) (software) An interconnected or interrelated group of nodes. *See also:* documentation; node. **(B) (software)** In connection with a disciplinary or problem oriented qualifier, the combination of material, documentation, and human resources that are united by design to achieve certain objectives, for example, a social science network, a science information network. *See also:* node; documentation. (C/SE) 729-1983

(4) (distribution of electric energy) An aggregation of interconnected conductors consisting of feeders, mains, and services. *See also:* alternating-current distribution; network analysis. (T&D/PE) [10]

(5) (A) (data management) A data structure in which components are allowed to have more than one superordinate component. *See also:* hierarchy; graph. **(B) (data management)** A graph in which the edges connecting the nodes are assigned weights representing some characteristic, such as cost or quantity, related to the edge.



network

(C) 610.5-1990

(6) A collection of interconnected hosts. The term network in this document is used to refer to the network of hosts. The batch system is used to refer to the network of batch servers. (C/PA) 1003.2d-1994

(7) A network is any set of devices or subsystems connected by links joining (directly or indirectly) a set of terminal nodes. (C/BA) 1355-1995

(8) An arrangement of components, or nodes, and interconnecting branches. *See also:* computer network; circuit; store-and-forward switched network; public data network; public circuit-switched network; net; decentralized computer network; centralized computer network; packet switching network; distributed computer network; communications network; public switched network; switched network; value-added network; circuit-switched network; private network; public packet switching network; software defined network. (C) 610.7-1995, 610.10-1994w

(9) A communication mechanism for interconnecting multiple Smart Transducers. (IM/ST) 1451.1-1999

network address A network-visible identifier used to designate specific endpoints in a network. Specific endpoints on host systems shall have addresses, and host systems may also have addresses. (C) 1003.5-1999

network address attributes The Organizational-Unit-Name-1, Organizational-Unit-Name-2, Organizational-Unit-Name-3, and Organizational-Unit-Name-4 attributes specific to the class. (C/PA) 1224.1-1993w

network allocation vector (NAV) An indicator, maintained by each station, of time periods when transmission onto the wireless medium (WM) will not be initiated by the station whether or not the station's clear channel assessment (CCA) function senses that the WM is busy. (C/LM) 8802-11-1999

network analysis (networks) The derivation of the electrical properties, given its configuration and element values. (Std100) 270-1966w

network analyzer (network analyzers) A system that measures the two-port transmission and one-port reflection characteristics of a multiport in its linear range at a common input and output frequency. *Note:* This includes systems that: (1) Measure magnitude of reflection and transmission coefficient only as well as those systems that measure magnitude and phase; (2) operate manually or automatically; (3) cover a frequency range either continuously or in small enough steps to make coverage practically continuous; (4) vary frequency manually or automatically, stepped, or swept. (IM/HFIM) 378-1986w

network architecture *See:* computer network architecture.

network byte order An implementation-defined way of representing an integer so that, when transmitted over a network via a network endpoint, the integer shall be transmitted as an appropriate number of octets with the most significant octet first. This term has been used in historical systems and base documents to denote this representation. This representation is used in many networking protocols, including Internet and OSI. However, it should not be assumed this representation is useful with all network protocols. (C) 1003.5-1999

Network Capable Application Processor (NCAP, IEEE1451_NCAP) (1) A device between the Smart Transducer Interface Module and the network that performs network communications, Smart Transducer Interface Module communications, and data conversion functions. (IM/ST) 1451.2-1997

(2) A device that supports a network interface, application functionality, and generally access to the physical world via one or more transducers. An IEEE1451_NCAP is an NCAP conformant to this standard. (IM/ST) 1451.1-1999

network capacitance (charging inductors) The effective capacitance of the pulse-forming circuit. (MAG) 306-1969w

network control (telephone switching systems) The means of determining and establishing the required connections in response to information received from the system control. (COM) 312-1977w

network control host A network management central control center that is used to configure agents, communicate with agents, and display information collected from agents. (C/LM) 802.3-1998

network control program (NCP) A software program that deals with the operation of a front-end computer or communications controller. (C) 610.7-1995

network database (1) (data management) A database in which data are organized into segments which represent nodes within a network. *Contrast:* relational database. (C) 610.5-1990w

(2) A database system that uses directed graphics to represent the data. (PE/EDPG) 1150-1991w

network feeder A feeder that supplies energy to a network. *See also:* center of distribution. (T&D/PE) [10]

network function Any impedance function, admittance function, or other function of p that can be expressed in terms of or derived from the determinant of a network and its cofactors. *Notes:* 1. This includes not only impedance and admittance functions as previously defined, but also voltage ratios, current ratios, and numerous other quantities. 2. Certain network functions are sometimes classified together for a given purpose (for example, those with common zeros or common poles). These represent subgroups that should be specifically defined in each special case. 3. In the case of distributed-parameter networks, the determinant may be an infinite one: the definition still holds. *See also:* network analysis. (Std100) 270-1966w

network hierarchy In data communications, a network with a single computer having control over all the nodes connected to it. (C) 610.7-1995

network host name A string of characters in the portable character set that identifies a specific host in a network. (C/PA) 1003.2d-1994

network interface (1) (telephone loop performance) The interface between the public switched telephone network and the customer premises wiring. (COM/TA) 820-1984r

(2) (demarcation point) The point of connection between the local loop and the end user's (customer's) wiring. (AMR/SCC31/SCC31) 1390-1995, 1390.2-1999, 1390.3-1999

network interface controller A communication device which permits the connection of information processing devices to a network. (C) 610.7-1995

network interface definition language (NIDL) A model, proposed by the Institute of Electrical and Electronics Engineers, for parallel processing and logical process partitioning across a distributed computer network. (C) 610.7-1995

network layer (1) (Layer 3) The layer of the ISO Reference Model that performs those routing and relaying services necessary to support data transmission over interconnected networks. (DIS/C) 1278.2-1995

(2) In Open Systems Interconnection (OSI) architecture, the layer that provides services to establish a path between open systems with a predictable quality of service. (LM/C) 8802-6-1994

(3) The third layer of the seven-layer OSI model; responsible for establishing routes between the sending and receiving stations. *Note:* This layer appends and removes routine headers on the data packets, selects paths for them, and regulates their flow to prevent congestion. The network layer may use intermediate systems. *See also:* entity layer; application layer;

client layer; session layer; logical link control sublayer; medium access control sublayer; physical layer; sublayer; presentation layer; transport layer; data link layer.
(C) 610.7-1995

network leased line or private wire (data transmission) A series of points interconnected by telegraph or telephone channels, and reserved for the exclusive use of one customer.
(PE) 599-1985w

network limiter An enclosed fuse for disconnecting a faulted cable from a low-voltage network distribution system and for protecting the unfaulted portions of that cable against serious thermal damage.
(SWG/PE/TR) C37.100-1992, C57.12.44-1994

network loading unit (NLU) The time required to transmit one octet over the MIB Physical layer.
(EMB/MIB) 1073.3.1-1994

network, load matching *See:* load-matching network.

network management (1) The functions related to the management of Data Link Layer and Physical Layer resources and their status across an IEEE 802® local area network (LAN) or metropolitan area network (MAN).
(LM/C) 8802-6-1994

(2) The collection of administrative structures, policies, and procedures that collectively provide for the management of the organization and operation of the network as a whole.
(DIS/C) 1278.1-1995, 1278.2-1995

(3) In networking, a management function defined for monitoring, controlling, and coordinating the resources which allow communication to take place. *See also:* security management; performance management; configuration management; accounting management; fault management.
(C) 610.7-1995

network management environment An environment in which information processing system or resources communicate conforming to the services and protocols of network management.
(C) 610.7-1995

network management process (NMP) The entity that provides access to network management functions on behalf of the user of the network management services. In order to perform this function, NMPs may intercommunicate in a peer-to-peer manner and may use the services of NMPs in other nodes via a network management protocol. The NMP at a node is the user of the service provided at the Layer Management Interface (LMI).
(LM/C) 8802-6-1994

network management protocol A protocol in which objects can be accessed in a network management environment.
(C) 610.7-1995

network management system A system that monitors, controls, and coordinates the resources to facilitate communication. *See also:* security management; configuration management; accounting management; fault management; performance management.
(C) 610.7-1995

network master relay A relay that functions as a protective relay by opening a network protector when power is backfed into the supply system and as a programming relay by closing the protector in conjunction with the network phasing relay when polyphase voltage phasors are within prescribed limits.
(SWG/PE/TR) C37.100-1992, C57.12.44-1994

network model (data management) A data model in which entities are represented as nodes within a modified tree structure that permits all but the root to have multiple parents. *Note:* The network model was originally proposed as the CODASYL model by the Conference on Data Systems Languages (CODASYL) and described in their 1968 and 1971 publications.
(C) 610.5-1990w

network object In computer security, a passive entity on a computer network that contains or receives information. For example: a data file, video display, clock, or printer. *Contrast:* network subject.
(C) 610.7-1995

network operations center A center that is responsible for the operational aspects of a network. *Note:* Among these are monitoring and controlling, trouble-shooting, user-assistance.
(C) 610.7-1995

network pathname The pathname of a file that includes the name of the host on which it resides. This amendment allows two syntaxes for a network pathname:

pathname@hostname
hostname:pathname

(C/PA) 1003.2d-1994

network phasing relay A monitoring relay that has as its function to limit the operation of a network master relay so that the network protector may close only when the voltages on the two sides of the protector are in a predetermined phasor relationship.
(SWG/PE/TR) C37.100-1992, C57.12.44-1994

network primary distribution system A system of alternating-current distribution in which the primaries of the distribution transformers are connected to a common network supplied from the generating station or substation distribution buses. *See also:* alternating-current distribution.
(T&D/PE) [10]

network, private line telegraph *See:* private line telegraph network.

network, private line telephone *See:* private line telephone network.

network protector (power and distribution transformers) An assembly comprising a circuit breaker and its complete control equipment for automatically disconnecting a transformer from a secondary network in response to predetermined electrical conditions on the primary feeder or transformer, and for connecting a transformer to a secondary network either through manual control or automatic control responsive to predetermined electrical conditions on the feeder and the secondary network. *Note:* The network protector is usually arranged to connect automatically its associated transformer to the network when conditions are such that the transformer, when connected, will supply power to the network and to automatically disconnect the transformer from the network when power flows from the network to the transformer.
(SWG/PE/TR) C37.100-1992, C57.12.80-1978r, C57.12.44-1994

network protector fuse A back-up device for the network protector.
(PE/TR) C57.12.44-1994

network restraint mechanism A device that prevents opening of a network protector on transient power reversals that either do not exceed a predetermined value or persist for a predetermined time.
(SWG/PE) C37.100-1992

network secondary distribution system A system of alternating-current distribution in which the secondaries of the distribution transformers are connected to a common network for supplying light and power directly to consumers' services. *See also:* alternating-current distribution.
(T&D/PE/TR) [10], C57.12.44-1994

network server On a network, a server that provides special network applications to all users at the network level; that is, it allows all users to share files more easily and have larger file storage areas available for their use. *See also:* disk server; file server; mail server; terminal server; database server; print server.
(C) 610.7-1995

network service An application, such as file transfer protocol, available on a network.
(C) 610.7-1995

network service access point (NSAP) The point at which an entity can request connection to the network. In IEEE 1073, both BCCs and DCCs have an NSAP.
(EMB/MIB) 1073.3.1-1994

network structure (data management) A collection of entities that are organized in a network fashion. *Synonym:* net structure. *Contrast:* hierarchical structure.
(C) 610.5-1990w

network subject In computer security, an active entity on a computer network that causes information to flow through the network or changes the network state. For example, a processor or program operating in support of a process or user requirement. *Contrast:* network object. *See also:* single-level network subject; multilevel network subject.
(C) 610.7-1995

network synthesis (networks) The derivation of the configuration and element values, with given electrical properties. *See also:* network analysis. (Std100) 270-1966w

network theory The study of networks used to model processes such as communications, computer performance, routing problems, and project management. (C) 610.3-1989w

network transformer (power and distribution transformers) A transformer designed for use in a vault to feed a variable capacity system of interconnected secondaries. *Note:* A network transformer may be of the submersible or of the vault type. It usually, but not always, has provision for attaching a network protector. (PE/TR) C57.12.80-1978r

network tripping and reclosing equipment A piece of equipment that automatically connects its associated power transformer to an ac network when conditions are such that the transformer, when connected, will supply power to the network and that automatically disconnects the transformer from the network when power flows from the network to the transformer. (SWG/PE) C37.100-1992

Network Visible Refers to objects or operations that can be accessed or invoked from a different process than the process in which the object or operation executes, in particular if the processes are in different network capable application processors (NCAPs) communicating over a network. In IEEE 1451.1, Network Visible objects or operations are also locally visible. (IM/ST) 1451.1-1999

Neumann boundary condition A boundary condition applied to the solution of a partial differential equation in which the derivative of the function, applied in the direction normal to the boundary, is specified as a constant at the boundary. (AP/PROP) 211-1997

neuroelectricity Any electric potential maintained or current produced in the nervous system. *See also:* electrobiology. (EMB) [47]

neuromuscular effect Effect pertaining to the nervous system associated with muscle function. (T&D/PE) 539-1990

neurosensory effect Effect pertaining to the nervous system associated with sensory function. (PE/T&D) 539-1990

neutral (1) (rotating machinery) The point along an insulated winding where the voltage is the instantaneous average of the line terminal voltages during normal operation. *See also:* asynchronous machine. (PE) [9]

(2) (hydroelectric power plants) Common point of a star-connected generator or transformer winding. (PE/EDPG) 1020-1988r

(3) For use with the figures in this guide, the term neutral is understood to be the center tap of a grounded three-phase transformer winding. Since only single-phase loads are depicted, the other phases of the supply transformer have been omitted for clarity. (PE/EDPG) 1050-1996

neutral conductor (circuit consisting of three or more conductors). The conductor that is intended to be so energized, that, in the normal steady state, the voltages from every other conductor to the neutral conductor, at the terminals of entry of the circuit into a delimited region, are definitely related and usually equal in amplitude. *Note:* If the circuit is an alternating-current circuit, it is intended also that the voltages have the same period and the phase difference between any two successive voltages, from each of the other conductors to the neutral conductor, selected in a prescribed order, have a predetermined value usually equal to 2π radians divided by the number of phase conductors m. *See also:* network analysis; center of distribution. (Std100) 270-1966w

neutral direct-current telegraph system (single-current system) (single morse system) A telegraph system employing current during marking intervals and zero current during spacing intervals for transmission of signals over the line. *See also:* telegraphy. (EEC/PE) [119]

neutral ground (power and distribution transformers) An intentional ground applied to the neutral conductor or neutral point of a circuit, transformer, machine, apparatus, or system. (PE/EDPG/TR) 665-1995, C57.12.80-1978r

neutral grounding capacitor (electric power) A neutral grounding device the principal element of which is capacitance. *Note:* A neutral grounding capacitor is normally used in combination with other elements, such as reactors and resistors. *See also:* grounding device. (PE/SPD/T&D) 32-1972r, [10]

neutral grounding device (electric power) A grounding device used to connect the neutral point of a system of electric conductors to earth. *Note:* The device may consist of a resistance, inductance, or capacitance element, or a combination of them. *See also:* grounding device; neutral grounding impedor. (SPD/PE/T&D) 32-1972r, [10]

neutral grounding impedor (electric power) A neutral grounding device comprising an assembly of at least two of the elements resistance, inductance, or capacitance. *See also:* grounding device; neutral grounding device. (SPD/PE/T&D) 32-1972r, [10]

neutral grounding reactor (1) A current-limiting inductive reactor for connection in the neutral for the purpose of limiting and neutralizing disturbances due to ground faults. (PE/TR) C57.12.80-1978r

(2) (neutral grounding devices) One in which the principal element of which is inductive reactance. (SPD/PE) 32-1972r

neutral grounding resistor (electric power) A neutral grounding device, the principal element of which is resistance. *See also:* grounding device. (SPD/PE/T&D) 32-1972r, [10]

neutral grounding wave trap A neutral grounding device comprising a combination of inductance and capacitance designed to offer a very high impedance to a specified frequency or frequencies. *Note:* The inductances used in neutral grounding wave traps should meet the same requirements as neutral grounding reactors. (SPD/PE) 32-1972r

neutralization A method of nullifying the voltage feedback from the output to the input circuits of an amplifier through the tube interelectrode impedances. *Note:* Its principal use is in preventing oscillation in an amplifier by introducing a voltage into the input equal in magnitude but opposite in phase to the feedback through the interelectrode capacitance. *See also:* amplifier; feedback. (AP/BT/ANT) 145-1983s, 182A-1964w

neutralizing indicator An auxiliary device for indicating the degree of neutralization of an amplifier. (For example, a lamp or detector coupled to the plate tank circuit of an amplifier.) *See also:* amplifier. (AP/ANT) 145-1983s

neutralizing transformers (wire-line communication facilities) A device which introduces a voltage into a circuit pair to oppose an unwanted voltage. It neutralizes extraneous longitudinal voltages resulting from ground potential rise, or longitudinal induction, or both, which simultaneously allowing ac or dc metallic signals to pass. These transformers are primarily used to protect communication circuits at power stations, or along routes where exposure to power line induction is a problem, or both. (PE/PSC) 487-1980s

neutralizing transformers and reactors Devices that introduce a voltage into a circuit pair to oppose an unwanted voltage. These devices neutralize extraneous longitudinal voltages resulting from ground potential rise, or longitudinal induction, or both, while simultaneously allowing ac and dc metallic signals to pass. These transformers or reactors are primarily used to protect telecommunication or control circuits at power stations or along routes where exposure to power line induction is a problem, or both. (PE/PSC) 487-1992

neutralizing voltage The alternating-current voltage specifically fed from the grid circuit to the plate circuit (or vice versa), deliberately made 180 degrees out of phase with, and equal in amplitude to, the alternating-current voltage similarly transferred through undesired paths, usually the grid-to-plate tube capacitance. *See also:* amplifier. (AP/ANT) 145-1983s

neutral keying (data transmission) A form of telegraph signal which has current either on or off in the circuit with "on" as mark, "off" as space. (PE) 599-1985w

neutral lead (rotating machinery) A main lead connected to the common point of a star-connected winding. *See also:* asynchronous machine. (PE) [9]

neutral point (system) The point that has the same potential as the point of junction of a group of equal nonreactive resistances if connected at their free ends to the appropriate main terminals or lines of the system. *Note:* The number of such resistances is 2 for direct-current or single-phase alternating-current, 4 for two-phase (applicable to 4-wire systems only), and 3 for three-, six- or twelve-phase systems. *See also:* direct-current distribution; alternating-current distribution; center of distribution. (T&D/PE) [10]

(2) (A) (power and distribution transformers) The common point of a Y connection in a polyphase system. **(B) (power and distribution transformers)** The point of a symmetrical system which is normally at zero voltage. (PE/TR) C57.12.80-1978

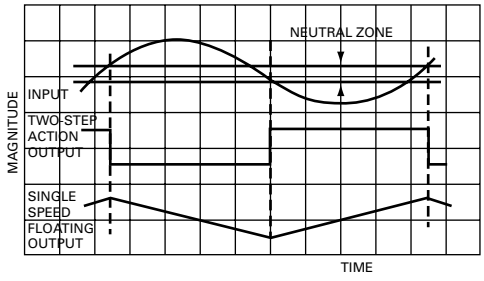
neutral relay (1) A relay in which the movement of the armature does not depend upon the direction of the current in the circuit controlling the armature. (EEC/REE) [87]

(2) A relay that responds to quantities in the neutral of a power circuit. (SWG/PE) C37.100-1992

neutral terminal The terminal connected to the neutral of a machine or apparatus. *See also:* asynchronous machine. (PE) [9]

neutral wave trap (electric power) A neutral grounding device comprising a combination of inductance and capacitance designed to offer a very high impedance to a specified frequency or frequencies. *See also:* grounding device. (SPD/PE) 32-1972r

neutral zone (control element) The range of values of input for which no change in output occurs. *Note:* The neutral zone is an adjustable parameter in many two-step and floating control systems. *See also:* dead band.



neutral zone

(PE/EDPG) [3]

new installation (elevators) Any installation not classified as an existing installation by definition, or an existing elevator, dumbwaiter, or escalator moved to a new location subsequent to the effective date of a code. *See also:* elevator. (EEC/PE) [119]

newline The character or characters necessary to generate the start of the next line of ASCII text. May also be known as a carriage-return (CR), linefeed (LF), or a CR-LF combination. (C/TT) 1450-1999

⟨**newline**⟩ A character that in the output stream shall indicate that printing should start at the beginning of the next line. The ⟨newline⟩ shall be the character designated by '\n' in the C-language binding. It is unspecified whether this character is the exact sequence transmitted to an output device by the system to accomplish the movement to the next line. (C/PA) 9945-2-1993

new-line character (NL) *See:* carriage return character.

newline string A white space string consisting only of the ⟨newline⟩ character. (C/PA) 1387.2-1995

new source statements The sum of the added and modified source statements. (C/SE) 1045-1992

new sync (data transmission) Allows for a rapid transition from one transmitter to another on multipoint private line data networks. (PE) 599-1985w

newton (metric practice) That force which, when applied to a body having a mass of one kilogram, gives it an acceleration of one meter per second squared. (QUL) 268-1982s

NEXT *See:* near end crosstalk.

Next Page General class of pages optionally transmitted by Auto-Negotiation able devices following the base Link Code Word negotiation. (C/LM) 802.3-1998

Next Page Algorithm (NPA) The algorithm that governs Next Page communication. (C/LM) 802.3-1998

Next Page Bit A bit in the Auto-Negotiation base Link Code Word or Next Page encoding(s) that indicates that further Link Code Word transfer is required. (C/LM) 802.3-1998

next program counter (nPC) Contains the address of the instruction to be executed next (if a trap does not occur). (C/MM) 1754-1994

next transfer address (NTA) A pointer in a slave to the module register that will be accessed during the next data transfer. The NTA register may be written during a primary address cycle and may be read or written during a secondary address cycle. During block and pipelined transfers the NTA may be automatically modified between data cycles. (NID) 960-1993

n gate thyristor (anode gate scr) A thyristor in which the gate terminal is connected to the n region adjacent to the region to which the anode terminal is connected and which is normally switched to the ON state by applying a negative signal between gate and anode terminals. (IA/IPC) 428-1981w

NIAM *See:* Nijssen's Information Analysis Method.

nibble (1) (MULTIBUS) A group of four adjacent bits operated on as a unit. (C/LM/MM) 802.9a-1995w, 1296-1987s

(2) Slang term for half a byte; or the first four or last four bits of an octet. *Synonym:* nybble. *See also:* quartet. (C) 610.10-1994w

(3) A group of four data bits. The unit of data exchange on the Media Independent Interface (MII). (C/LM) 802.3-1998

(4) Four bits of data. (C/MM) 1394a-2000

(5) (nybble) (mathematics of computing) *See also:* quartet. (C) 1084-1986w

Nibble Mode An asynchronous, reverse (peripheral-to-host) channel, under control of the host. Data bytes are transmitted as two sequential, 4-b nibbles using four peripheral-to-host status lines. Nibble Mode is used with Compatibility Mode to implement a bidirectional channel. These two modes cannot be active simultaneously. (C/MM) 1284-1994

Nichols chart (control system feedback) (Nichols diagram) A plot showing magnitude contours and phase contours of the return transfer function referred to ordinates of logarithmic loop gain and to abscissae of loop phase angle. *See also:* feedback control system. (PE/EDPG) [3]

nickel-cadmium storage battery An alkaline storage battery in which the positive active material is nickel oxide and the negative contains cadmium. *See also:* battery. (EEC/PE) [119]

NIDL *See:* network interface definition language.

night (illuminating engineering) The hours between the end of evening civil twilight and the beginning of morning civil twilight. *Note:* Civil twilight ends in the evening when the center of the sun's disk is six degrees below the horizon and begins in the morning when the center of the sun's disk is six degrees below the horizon. *See also:* civil twilight. (EEC/IE) [126]

night alarm An electric bell or buzzer for attracting the attention of an operator to a signal when the switchboard is partially attended. (EEC/PE) [119]

night effect (navigation aid terms) (radio navigation systems) A special case of error occurring predominantly at

night when sky-wave propagation is at the maximum. (AES/GCS) 172-1983w

nighttime interference A radio disturbance caused by skywave signals from distant stations. Skywave propagation loss is lowest at night. (T&D/PE) 1260-1996

Nijssen's Information Analysis Method (NIAM) Named after Dr. G. M. Nijssen, leader of Control Data Corporation's research team on information systems development, NIAM is a method for performing information analysis based on a general framework for information systems in which terms like information, information flow, and information system are explained. In this framework, the conceptual grammar is an essential part that describes the static and dynamic aspects of the object system accurately and completely. Although formal, the conceptual grammar is perfectly understandable for users, enabling them to participate fully in the development of an information system. (ATLAS) 1232-1995

NIM (1) (A) A committee sponsored by the United States Department of Energy and associated with the United States National Institute of Standards and Technology. It produced the NIM instrumentation system specifications, endorsed the use of CAMAC, and collaborates with ESONE in the maintenance and extension of CAMAC. (B) A standardized modular instrumentation system consisting of NIM MODULES and NIM BINS as defined in DOE/ER-0457T, May 1990. (NID) 960-1993

(2) A standardized modular instrumentation system consisting of NIM Modules and NIM Bins as defined in DOE Report DOE/ER-0457T, May 1990. (NPS) 325-1996

NIM Bin A mounting unit or housing for NIM Modules that conforms to the requirements of DOE Report DOE/ER-0457T, May 1990 It includes bussed connectors at the rear that mate with connectors on the modules to provide the modules with power. (NPS) 325-1996

NIM Module, NIM Instrument A modular functional unit or instrument that mounts in a NIM bin And conforms to the requirements of DOE Report DOE/ER-0457T, May 1990. (NPS) 325-1996

911 call (telephone switching systems) (nine-one-one call) A call to an emergency service bureau. (COM) 312-1977w

nines check *See:* casting out nines.

nines complement (1) The radix-minus-one complement of a numeral whose radix is ten. (C) [20], [85]

(2) (mathematics of computing) The diminished-radix complement of a decimal numeral, which is formed by subtracting each digit from 9. For example, the nines complement of 4830 is 5169. *Synonym:* complement on nine. (C) 1084-1986w

1988 class A class for which all the specific attributes are for the 1988 version of the CCITT X.400 Recommendation alone. (C/PA) 1224.1-1993w

ninety-percent response time (electric instruments) (of a thermal converter) The time required for 90 percent of the change in output electromotive force to occur after an abrupt change in the input quantity to a new constant value. *See also:* thermal converter. (EEC/AII) [102]

nipple (rigid metal conduit) A straight piece of rigid metal conduit not more than two feet in length and threaded on each end. *See also:* raceway. (EEC/CON) [28]

NIST *See:* National Institute for Standards and Technology.

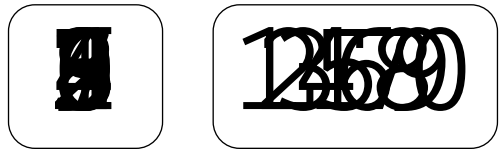
NIST source verification The process of verification of the capability of a manufacturer to calibrate a radionuclide source that is traceable to NIST. This is achieved through calibration by the manufacturer of a source distributed by NIST without disclosure of the known value. The reported value is compared to the NIST value and, if appropriate, a report of traceability is issued. (NI) N42.22-1995

NIST traceability The process of relating the measurement accuracy of radionuclide sources to national physical standards. Traceability is achieved by demonstrating the capability to produce accurate standardized sources by participation in a MAP with linkage to NIST and production of certified materials in accordance with a quality assurance program that meets the guidance provided in this standard. Traceability of sources requires demonstrated measurement traceability and applies only to products produced in accordance with this standard. (NI) N42.22-1995

nit (1) (television) The unit of luminance (photometric brightness) equal to one candela per square meter. *Note:* Candela per square meter is the unit of luminance in the International System of Units (SI). Nit is the name recommended by the International Commission on Illumination (CEI). (BT/AV) 201-1979w

(2) Also called "nat". (IT) [123]

Nixie tube display device A display device that employs a gas-filled digital indicator tube containing stacked metallic elements which, when energized, emit a glow in the shape of a number.



Nixie tube display device

(C) 610.10-1994w

NL *See:* new-line character.

N-layer A subdivision of the architecture, constituted by subsystems of the same rank (N). (C/LM/CC) 8802-2-1998

***n*–level address (1) (computers)** A multilevel address that specifies *n* levels of addressing. (C) [20], [85]

(2) (software) An indirect address that specifies the first of a chain of *n* storage locations, the first $n-1$ of which contain the address of the next location in the chain and the last of which contains the desired operand. For example, a two-level address. *Contrast:* direct address; immediate data. (C) 610.12-1990

n-level address In indirect addressing, the nth address sought in the attempt to arrive at the location of the operand; for example, a third-level address represents the address of the address of the address of the operand. *Note:* A zero-level address is the same as an immediate address; a one-level address is a direct address; and a two-level address is an indirect address. (C) 610.10-1994w

NLQ *See:* near-letter quality.

NLP *See:* Normal Link Pulse.

NLP Receive Link Integrity Test Function Auto-Negotiation's Link Integrity Test function that allows backward compatibility with the 10BASE-T Link Integrity Test function of IEEE 802.3. (LM/C) 802.3u-1995s

NLP sequence A Normal Link Pulse sequence, defined in IEEE 802.3 as TP_IDL. (LM/C) 802.3u-1995s

NLU *See:* network loading unit.

NMOS *See:* n-channel metal-oxide semiconductor.

NMP *See:* network management process.

N/M register set A generic term to indicate the microprocessor registers that deal with the retention of high and low memory addresses. *Note:* Usually used in scalable RISC computer discussions. *See also:* register set. (C) 610.10-1994w

***n–m* tree (data management)** A tree in which each node has at least *n* but no more than *m* subtrees; for example, 2-4 tree. *Note:* A 2-4 tree is sometimes written as 2-3-4 tree. (C) 610.5-1990w

***n-n* junction (semiconductor)** A region of transition between two regions having different properties in *n*-type semiconducting material. *See also:* semiconductor device. (EEC/PE) [119]

no-address instruction *See:* zero-address instruction.

no-backoff error A transmission state that results from a transceiver transmitting when there is no carrier, and without waiting for the necessary delay. (C) 610.7-1995

noble potential A potential substantially cathodic to the standard hydrogen potential. *See also:* stray-current corrosion. (IA) [59]

no-busy test call (telephone switching systems) A call in which busy testing is inhibited. (COM) 312-1977w

nochange timing check A timing check similar to a setup/hold timing check except the setup and hold times are referred to opposite transitions of the reference signal. The stable interval is extended to include the period between these transitions; that is, the time for which the reference signal stays in a specified state. This timing check is frequently applied to memory banks and latch banks to establish the stability of the address or to select inputs before, during, and after the write pulse. (C/DA) 1481-1999

nodalization (A) The set of nodes within a system being modeled. **(B)** The process of developing the nodes as in (A). (C) 610.3-1989

nodal point *See:* node.

nodding-beam height finder A height-finding radar with a fan beam oriented with its narrow beamwidth in elevation, and which mechanically sector scans (nods) in elevation to locate the target and determine its elevation angle. (AES) 686-1997

node (1) (network analysis) One of the set of discrete points in a flow graph. (CAS) 155-1960w

(2) (software) In a diagram, a point, circle, or other geometric figure used to represent a state, event, or other item of interest. *See also:* graph. (C) 610.12-1990

(3) (modeling and simulation) A single entity that is represented in a mathematical model; for example, in a model of a nuclear reactor, a water pump or section of pipe. (C) 610.3-1989w

(4) (data management) In a tree, an element that is used to contain information that describes some object; for which there is at least one key used to identify the node. *Note:* Nodes are connected to each other by link fields to form the tree. *Synonym:* vertex. *See also:* terminal node; child node; parent node; nonterminal node; root node. (C) 610.5-1990w

(5) (A) (broadband local area networks) A point of junction between two connectors. **(B) (broadband local area networks)** The location where a line has a defined position. **(C) (broadband local area networks)** The point where signals leave one system and enter another. (LM/C) 802.7-1989

(6) In the context of Open Firmware, node is a synonym for device node. *See also:* device node. (C/BA) 1275-1994

(7) A general term denoting either a switching element in a network or a host computer attached to a network. (DIS/C) 1278.1-1995, 1278.2-1995

(8) An entity associated with one or more interconnected lincs and optionally containing other functional units, such as cache and memory. In normal operation each node can be accessed independently (a control-register update on one node has no effect on the control registers of another node). (C/MM) 1596-1992

(9) A device or subsystem having one or more link interfaces. A node may be a terminal node (q.v.). A node may perform a routing function, routing packets between its node interfaces according to the information in the destination field of the packet. (C/BA) 1355-1995

(10) A device that consists of an access unit (AU) and a single point of attachment of the access unit to each bus of a DQDB subnetwork for the purpose of transmitting and receiving data on that subnetwork. Adjacent nodes are connected by a transmission link. (LM/C) 8802-6-1994

(11) (A) In networking, a point or a junction in a transmission system where lines or trunks from one or more systems meet. *Synonyms:* branch point; junction point; nodal point; vertex. **(B)** In data communications, a device or station that implements some part of the communication protocol. (C) 610.7-1995

(12) Within a circuit, a point of interconnection between two or more components such as input and output terminals. (C) 610.10-1994w

(13) An addressable device attached to the Serial Bus with at least the minimum set of control registers. Changing the control registers on one node does not affect the state of control registers on another node. (C/MM) 1394-1995

(14) The entity associated with a particular set of control register addresses (including identification ROM and reset command registers) that is initially defined in a 4 Kbyte (minimum) initial node address space. In normal operation each node can be accessed independently (a control register update on one node has no effect on the control registers of another node). (C/MM) 1596.5-1993

(15) The software visible station on a bus. (each node is allocated a set of control register addresses [including identification-ROM and reset command registers], which are initially defined in a 4 kbyte [minimum] initial node address space. Although multiple nodes may share one bus interface, each node can be reset independently [a reset of one node has no effect on any other node]. Each module consists of one or two nodes that are independently initialized and configured by operating system software.) (C/BA/MM) 14536-1995, 13213-1994

(16) A term used to describe a RamLink slave within the context of the CSR Architecture. The entity associated with a particular set of control-register addresses (including identification ROM and reset-command registers). In normal operation each node can be accessed independently (a control-register update on one node has no effect on the control registers of another node). (C/MM) 1596.4-1996

(17) A modeled function located within the hierarchical graph structure of an IDEF0 model by its designated node number; as a function, a node is represented in a diagram by a named box. (C/SE) 1320.1-1998

(18) A set of Control and Status Register (CSR) addresses (including identification read-only memory and reset command registers) that are initially defined in a 4 kB (minimum) initial node address space. Each node can be reset independently (a reset of one node has no effect on other nodes). (C/BA) 1014.1-1994w, 896.2-1991w, 896.3-1993w, 896.4-1993w, 896.10-1997

(19) A conceptual point (through which logic signals pass) that has been identified as an aid to modeling the timing properties of a cell but may not correspond to any physical structure. In Physical Design Exchange Format (PDEF), this is a physical pin that does not correspond to a logical structure. (C/DA) 1481-1999

(20) A Serial Bus device that may be addressed independently of other nodes. A minimal node consists of only a physical layer (PHY) without an enabled link. If the link and other layers are present and enabled they are considered part of the node. (C/MM) 1394a-2000

(21) *See also:* batch node.

node absorption (network analysis) A flow-graph transformation whereby one or more dependent nodes disappear and the resulting graph is equivalent with respect to the remaining node signals. *Note:* For example, a circuit analog of node absorption is the star-delta transformation. (CAS) 155-1960w

nodecast An adjective used to describe an interrupt or message transaction that is distributed to all units on a node. Also used as a verb; e.g., "transactions may be nodecast to all units on a node." (C/MM) 1212-1991s

node controller A component within a node that provides a coordination point for management functions exclusively local to a given node and involving the application, transaction, link, and physical elements located at that node. (C/MM) 1394-1995

node equations (networks) Any set of equations (of minimum number) such that the independent node voltages of a specified network may be determined from the impressed currents. *Notes:* 1. The number of node equations for a given network is not necessarily the same as the number of mesh or loop equations for that network. 2. Notes for mesh or loop equations, with appropriate changes, apply here. *See also:* network analysis. (Std100) 270-1966w

node_id (1) A 16 b value that determines the initial node address space. On some buses, the node_id value has two components: a *bus_id* field specifies one of 1024 bus address and an *offset_id* field specifies one of 64 node positions on the bus. During system initialization, software is expected to assign unique node_id values to nodes within a system. (C/MM) 1212-1991s

(2) A 16 b number that defines the initial node address space. During system initialization, systemwide unique node_id values may be assigned to nodes within a tightly coupled system. (C/BA) 896.9-1994w, 896.3-1993w

(3) A 16 b number that determines the node address space. After system initialization, unique node_id values have been assigned to all nodes within a tightly coupled system. The node_id is the part of the 64 b address that is used for routing packets. (C/MM) 1596-1992

(4) A unique 16 b number that distinguishes the node from other nodes in the system. The ten most significant bits of node_id are the same for all nodes on the same bus; this is the bus_id. The six least-significant bits of node_id are unique for each node on the same bus; this is called the physical_id. (C/MM) 1394-1995

(5) A 16-bit number that uniquely differentiates a node from all other nodes within a group of interconnected buses. The ten most significant bits of node ID are the same for all nodes on the same bus, i.e., the bus ID. The six least significant bits of node ID are unique for each node on the same bus; this is called the physical ID. The physical ID is assigned as a consequence of bus initialization. (C/MM) 1394a-2000

node index A text listing, often indented, of the nodes in an IDEF0 model, shown in outline order. Same meaning and node content as a node tree. (C/SE) 1320.1-1998

node interface A link interface on a switch. *See also:* link interface; switch. (C/BA) 1355-1995

node letter The letter that is the first character of a node number. (C/SE) 1320.1-1998

node name A text string of the form "`driver-name@unit-address:device-arguments`", which identifies a device node within the address space of its parent. (C/BA) 1275-1994

node number An expression that unambiguously identifies a function's position in a model hierarchy. A node number is constructed by concatenating a node letter, the diagram number of the diagram that contains the box that represents the function, and the box number of that box. (C/SE) 1320.1-1998

node ROM A range of register addresses that are mapped to address offsets 1024 to 2047. (C/BA) 896.10-1997, 896.2-1991w

node signal (network analysis) A variable X_k associated with node k. (CAS) 155-1960w

node tree A graphical listing of the nodes of an IDEF0 model, showing parent-child relationships as a graphical tree. Same meaning and node content as a node index. (C/SE) 1320.1-1998

node voltage (networks) The voltage from a reference point to any junction point (node) in a network. *Note:* The assumptions of lumped-network theory are such that the path of integration is immaterial. (Std100) 270-1966w

no-fill mode In text formatting, an operating mode in which no justification is performed. (C) 610.2-1987

no-go *See:* go/no-go.

noise (1) (analog computer) Unwanted disturbances superimposed upon a useful signal, which tend to obscure its information content. Random noise is the part of the noise that is unpredictable, except in a statistical sense. (C) 165-1977w

(2) (A) (general) (data transmission) An undesired disturbance within the useful frequency band. *Note:* Undesired disturbances within the useful frequency band produced by other services may be called interference. **(B)** Any unwanted disturbance in a system, such as random variations in voltage or current, or extra bits in data. **(C)** Any unwanted variation in a signal. *See also:* intermodulation noise; crosstalk; Gaussian noise; white noise; impulse noise. (PE) 599-1985

(3) (phototubes) The random output that limits the minimum observable signal from the phototube. *See also:* phototube. (NPS) 175-1960w, 398-1972r

(4) (facsimile) Any extraneous electric disturbance tending to interfere with the normal reception of a transmitted signal. (COM) 168-1956w

(5) (hybrid computer linkage components) Unwanted disturbances superimposed upon a useful signal that tends to obscure its information content expressed in millivolts peak and referred to the input voltage. (C) 166-1977w

(6) (electrical noise) Unwanted electrical signals that produce undesirable effects in the circuits of the control systems in which they occur. (IA/PE/T&D/ICTL/EDPG) 518-1982r, 1050-1996, 1250-1995

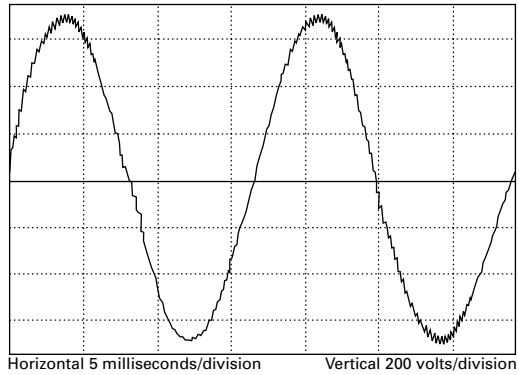
(7) (oscilloscopes) Any extraneous electric disturbance tending to interfere with the normal display. (IM) 311-1970w

(8) (broadband local area networks) Any unwanted signal in a communications system. White noise (or random noise) is random energy (e.g.,shot noise and thermal noise) that has a uniform distribution of energy across the band-pass. The analogy for white noise is white light. Johnson noise (thermal) is the noise generated by electron movement (current through a resistor) above absolute zero. The noise level is proportional to temperature. Shot noise is the type of unrandom noise generated when current flows across an abrupt junction. Shot noise is characteristic of semiconductor devices. (LM/C) 802.7-1989r

(9) (image processing and pattern recognition) Irrelevant data that hamper recognition and interpretation of data of interest. (C) 610.4-1990w

(10) Any deviation between the output signal (converted to input units) and the input signal, except deviations caused by linear time invariant system response (gain and phase shift), a dc level shift, or an error in the sample rate. For example, noise includes the effects of random errors, fixed pattern errors, nonlinearities and time base errors (fixed error in sample time and aperture uncertainty). (IM/WM&A) 1057-1994w

(11) Electrical noise is unwanted electrical signals that produce undesirable effects in the circuits of the control systems in which they occur. See figure below.



noise example

(IA/PE/SPD/PSE) 1100-1992s, C62.48-1995

(12) Undesirable sound emissions or undesirable electromagnetic signals/emissions. (PE/SUB) 1127-1998

(13) Unwanted electrical signals in the circuits of the control systems in which they occur. (SCC22) 1346-1998

noise amplitude distribution (control of system electromagnetic compatibility) A distribution showing the pulse amplitude that is equalled or exceeded as a function of pulse repetition rate. (EMC) C63.12-1987

noise, audio-frequency *See:* audio-frequency noise.

noise cleaning *See:* smoothing.

noise, common-mode *See:* common-mode noise.

noise-current generator A current generator, the output of which is described by a random function of time. *Note:* At a specified frequency, a noise-current generator can often be adequately characterized by its mean-square current within the frequency increment Δf or by its spectral density. If the circuit contains more than one noise-voltage generator or noise-current generator, the correlation coefficients among the generators must also be specified. *See also:* signal-to-noise ratio; network analysis; signal. (IE/ED) [43], [45]

noise, dBr*n* Decibels relative to one picowatt (0 dBr*n* equals −90 dBm) reference noise level. This is the customary North American unit for measurement of noise power on telecommunication circuits. (COM/TA) 1007-1991r

noise, dBr*n* C Decibels relative to one picowatt reference noise level, measured with C-message filter weighting. *Note:* there are several other filter weightings besides C-message. (COM/TA) 1007-1991r

noise definitions (data transmission) (1) dBa: For F1 A weighted noise measurement, usually obtained with a WECO 2B noise meter. 0 dBa equivalent to 1000 Hz tone with a power of -85 dBm. Or, a 3 kHz white noise band of -82 dBm. Filter produces a 3 dB loss over flat indication.

(2) dBmp: Filter produces a 2.5 dB loss compared to no weighting. For psophometrically weighted noise according to CCITT; 0 dBmp is equivalent to a 1000 Hz tone with a power of -1 dBm (or an 800 Hz tone with a power of 0 dBm). Or, a 3 kHz band of white noise with a power of +2.5 dBm. Filter produces a 2.5 dB loss compared to no weighting.

(3) dBrn 144: Obsolete unit for Type 144 weighted-noise measurement.

(4) dBrnC: For C-message weighted noise; 0 dBrnc is equivalent to a 1000 Hz tone with a power of -90 dBm (10^{-12} W (watt) or 90 dB below 1 mW (milliwatt). Or, 3 kHz white-noise band of a power of 88 dBm (actually 88.5 dBm). Filter produces a 2 dB loss compared to no weighting.

(5) dBrnCO, dBaO, pWpO, dBmpO: Noise units as measured in dBrnC, dBa, pWp, and dBmp at (or referred to) a 0 transmission level point.

(6) pWp: For psophometrically weighted noise; 1 pWp is equivalent to a 1000 Hz tone with a power of -91 dBm (or an 800 Hz tone of -90 dBm). Or, a 3 kHz band of white noise with a power of 88 dBm.

$$1\ \text{pWp} = \frac{1\ \text{pW}}{1.78} = 0.56\ \text{pW}$$

(PE) 599-1985w

noise, differential-mode *See:* transverse-mode noise.

noise diode, ideal *See:* ideal noise diode.

noise discriminator/noise guard/noise monitor A circuit or algorithm intended to discriminate between speech and noise. It can affect switching, transmission, and/or noise performance. (COM/TA) 1329-1999

noise, electrical *See:* electrical noise.

noise equivalent power (fiber optics) At a given modulation frequency, wavelength, and for a given effective noise bandwidth, the radiant power that produces a signal-to-noise ratio of 1 at the output of a given detector. *Notes:* 1. Some manufacturers and authors define NEP as the minimum detectable power per root unit bandwidth; when defined in this way, NEP has the units of watts/(hertz)$^{1/2}$. Therefore, the term is a misnomer, because the units of power are watts. 2. Some manufacturers define NEP as the radiant power that produces a signal-to-dark-current noise ratio of unity. This is misleading when dark-current noise does not dominate, as is often true in fiber systems. *See also:* detectivity; D-star. (Std100) 812-1984w

noise factor (1) (of a two-port transducer) At a specified input frequency the ratio of: a) the total noise power per unit bandwidth at a corresponding output frequency available at the output port when the noise temperature of its input termination is standard (290°K) at all frequencies, to b) that portion of *a* engendered at the input frequency by the input termination at the standard noise temperature (290°K). *Notes:* 1. For heterodyne systems there will be, in principle, more than one output frequency corresponding to a single input frequency, and vice versa: for each pair of corresponding frequencies a noise factor is defined. Definition b) includes only that noise from the input termination which appears in the output via the principal-frequency transformation of the system, that is, via the signal-frequency transformation(s), and does not include spurious contributions such as those from an unused image-frequency or an unused idler-frequency transformation. 2. The phrase "available at the output port" may be replaced by "delivered by system into an output termination." 3. To characterize a system by a noise factor is meaningful only when the admittance (or impedance) of the input termination is specified. *See also:* noise figure. (ED) 161-1971w

(2) The ratio noise energy of the input to the output of a device. The noise factor has an associated bandwidth of measurement. (LM/C) 802.7-1989r

noise figure (A) (interference terminology, linear system) (at a selected input frequency) The ratio of: a) the total noise power per unit bandwidth (at a corresponding output frequency) delivered by the system into an output termination, to b) the portion thereof engendered at the input frequency by the input termination, whose noise temperature is standard (290°K at all frequencies). *Notes:* 1. Numerically, the noise factor F at frequency f can be expressed as

$$\overline{F}(f) = \frac{P_{\text{noise out}}}{GP_{\text{noise in}}}$$

where $P_{\text{noise out}}$ and $P_{\text{noise in}}$ are taken at frequency f and 290 kelvins and G is the gain of the system at frequency f. 2. For heterodyne systems there will be, in principle, more than one output frequency corresponding to a single input frequency and vice versa; for each pair of corresponding frequencies a noise factor is defined. 3. The phrase "available at the output terminals" may be replaced by "delivered by the system into an output termination" without changing the sense of the definition. 4. The term "noise factor" is used where it is desired to emphasize that the noise figure is a function of input frequency. **(B) (interference terminology, linear system)** (average) The ratio of *a*, the total noise power delivered by the system into its output termination when the noise temperature of its input termination is standard (290 K) at all frequencies, to *b,* the portion thereof engendered by the input termination. *Notes:* 1. For heterodyne systems, portion *a* includes only that noise from the input termination that appears in the output via the principal frequency transformation of the system, and does not include spurious contributions such as those from image frequency transformations. 2. A quantitative relation between average noise factor F and spot noise factor $F(f)$ is

$$\overline{F} = \frac{\int_0^\infty F(f)G(f)\mathrm{d}f}{\int_0^\infty G(f)\mathrm{d}f}$$

where f is the input frequency and $F(f)$ is the ratio of *a*, the signal power delivered by the system into its output termination, to *b,* the corresponding signal power available from the input termination at the input frequency. For heterodyne systems, *a* comprises only power appearing in the output via the principal frequency transformation of the system. 3. To characterize a system by an average noise factor is meaningful only when the admittance (or impedance) of the input termination is specified. *Synonym:* noise factor. (PE) 599-1985

(2) (A) (broadband local area networks) The ratio of the total white noise energy at the output to the amount of Johnson noise at the output. The Johnson noise is due to the noise generated by the impedance of the signal source. **(B) (broadband local area networks)** The ratio noise energy of the input to the output of a device. The noise factor has an associated bandwidth of measurement. (LM/C) 802.7-1989

noise figure, average *See:* average noise figure.

noise floor The noise level at a referenced location and bandwidth. The video bandwidth is assumed to be a 4MHz bandwidth. A terminated 75Ω cable operating at 68°F or 20°C has a 4 MHz noise floor of − 59 dBmV. (LM/C) 802.7-1989r

noise-free equivalent amplifier (signal-transmission system) An ideal amplifier having no internally generated noise that has the same gain and input.output characteristics as the actual amplifier. *See also:* signal. (IE) [43]

noise generator (analog computer) In an analog computer, a computing element used purposely to introduce noise of specified amplitude distribution, spectral density, or root-mean square value, or appropriate combination therefore into other computing elements. (C) 165-1977w

noise generator diode A diode in which the noise is generated by shot effect and the noise power of which is a definite function of the direct current. (ED) [45]

noise, idle channel *See:* idle channel noise.

noise immunity The ability of a circuit to perform its function in the presence of noise. (C) 610.10-1994w

noise, impulse *See:* impulse noise.

noise jitter *See:* uncorrelated jitter.

noise killer (telegraph circuits) An electric network inserted usually at the sending end, for the purpose of reducing interference with other communication circuits. *See also:* telegraphy. (PE/EEC) [119]

noise level (1) (A) (audio and electroacoustics) The noise power density spectrum in the frequency range of interest, *See also:* signal-to-noise ratio. **(B) (audio and electroacoustics)** The average noise power in the frequency range of interest. *See also:* signal-to-noise ratio. **(C) (audio and electroacoustics)** The indication on a specified instrument. *Notes:* 1. In definition (C), the characteristics of the instrument are determined by the type of noise to be measured and the application of the results thereof. 2. Noise level is usually expressed in decibels relative to a reference value. *See also:* signal-to-noise ratio. (SP/PE) 151-1965, 599-1985

(2) (speech quality measurements) The A-weighted sound level of the noise. 297-1969w

noise-level test (rotating machinery) A test taken to determine the noise level produced by a machine under specified conditions of operation and measurement. *See also:* asynchronous machine. (PE) [9]

noise linewidth (1) (germanium gamma-ray detectors) (x-ray energy spectrometers) (charged-particle detectors) (semiconductor radiation detectors) The contribution of noise to the width of a spectral peak. (NPS/NID) 759-1984r, 301-1976s

(2) (charged-particle detectors) The contribution of electronic noise to the width of a spectral peak. (NPS) 300-1988r

(3) The contribution of electrical noise to the width of a spectral peak. (Electrical noise adds to the peak width in quadrature.) (NPS) 325-1996

noise, longitudinal *See:* longitudinal noise.

noise measurement units (data transmission) The following units are used to express weighted and unweighted circuit noise. They include terms used in American and International practice. *dBa-dBrn adjusted.* Weighted circuit noise power, in dB, referred to 3.16 pW (picowatts) (-85 dBm) which is 0 dBa. Use of F1 A line or HA1 receiver weighting is indicated in parenthesis as required. *dBrn (Describes above reference noise).* Weighted circuit noise power in dB referred to 1.0 pW (-90 dBm) which is 0 dBrn. Use of 144 line, 144 receiver, or C message weighting, parentheses, as required. With C-message weighting, as 1 mW (milliwatt), 1000 Hz tone will read +90 dBrn, but the same power as white noise distributed over a $3kH_3$ band (nominally 300 to 3300 Hz) will read approximately +88.5 dBrn (rounded off to +88 dBrn, due to frequency weighting). With 144 weighting, as 1 mW, 1000 Hz tone will also read +90 dBrn, but the same $3kH_3$ white-noise power would read only +82 dBrn, due to the different frequency weighting. (PE) 599-1985w

noise measuring set *See:* circuit noise meter.

noise, metallic *See:* metallic noise.

noise, normal-mode *See:* normal-mode noise.

noise power (Hall effect devices) The power generated by a random electromagnetic process. (MAG) 296-1969w

noise-power ratio (NPR) (data transmission) (expressed in decibels) This is a term commonly used in noise loading technique. Usually an uncalibrated receiver is used to measure the noise power in a channel of a system loaded with noise, first with full noise in the channel and the noise source. The ratio of these readings is the NPR. An NPR reading is independent of the noise bandwidth of the receiver; provided the same bandwidth is used in both noise measurements and the band stop filters are wide enough. (PE) 599-1985w

noise pressure equivalent (electroacoustic transducer or system used for sound reception) The root-mean-square sound pressure of a sinusoidal plane progressive wave that, if propagated parallel to the principal axis of the transducer, would produce an open-circuit signal voltage equal to the root-mean-square of the inherent open-circuit noise voltage of the transducer in a transmission band having a bandwidth of 1 hertz and centered on the frequency of the plane sound wave. *Note:* If the equivalent noise pressure of the transducer is a function of secondary variables, such as ambient temperature or pressure, the applicable values of these quantities should be stated explicitly. *See also:* phonograph pickup. (SP) [32]

noise quieting (receiver performance) (receiver) A measure of the quantity of radio-frequency energy, at a specified deviation from the receiver center frequency, required to reduce the noise output by a specified amount. (VT) [37]

noise reduction (photographic recording and reproducing) A process whereby the average transmission of the sound track of the print (averaged across the track) is decreased for signals of low level and increased for signals of high level. *Note:* Since the noise introduced by the sound track is less at low transmission, this process reduces film noise during soft passages. The effect is normally accomplished automatically. *See also:* phonograph pickup. (SP) [32]

noise referred to the input (of an amplifier) The electronic noise level at the input of a hypothetically noise-free amplifier that would produce the same noise as measured at the point of observation in the actual amplifier. This definition is implied when the term "amplifier noise" is used without qualifications. (NPS) 325-1996

noise sidebands (non-real time spectrum analyzer) Undesired response caused by noise internal to the spectrum analyzer appearing on the display around a desired response. (IM) 748-1979w

noise suppression *See:* smoothing.

noise temperature (1) (general) (at a pair of terminals and at a specific frequency) The temperature of a passive system having an available noise power per unit bandwidth equal to that of the actual terminals. *Note:* Thus, the noise temperature of a simple resistor is the actual temperature of the resistor, while the noise temperature of a diode may be many times the observed absolute temperature. *See also:* signal; signal-to-noise ratio. (IE) [43]

(2) (standard) The standard reference temperature T_0 for noise measurements is 290°K. *Note:* $kT_0/e = 0.0250$ volt, where e is the magnitude of the electronic charge and k is Boltzmann's constant. (ED) 161-1971w

(3) (of an antenna) The temperature of a resistor having an available thermal noise power per unit bandwidth equal to that at the antenna output at a specified frequency. *Note:* Noise temperature of an antenna depends on its coupling to all noise sources in its environment as well as noise generated within the antenna. (AP/ANT) 145-1993

(4) (at a port) The temperature of a passive system having an available noise power per unit bandwidth equal to that of the actual port, at a specified frequency. A uniform temperature throughout the passive system is implied. *See also:* thermal noise. (ED) 161-1971w

(5) (port) (selected frequency) (at a port and at a selected frequency) A temperature given by the exchangeable noise-power density divided by Boltzmann's constant, at a given port and at a stated frequency. *Notes:* 1. When expressed in units of kelvins, the noise temperature T is given by the relation

$$T = \frac{N}{k}$$

where N is the exchangeable noise-power density in watts per hertz at the port at the stated frequency and k is Boltzmann's constant expressed as joules per kelvin ($k \cong 1.38 \times 10^{-23}$ joules per kelvin). 2. Both N and T are negative for a port with an internal impedance having a negative real part. *See also:* signal-to-noise ratio; waveguide. (ED) [45]

(6) (average operating) Equivalent temperature of passive system having an available noise power equal to that of the operating system. In space communication systems the noise temperature is generally composed of contributions from the background, atmospheric, and receiver front end noise. (COM) [25]

noise-to-ground (data transmission) In telephone practice, the weighted noise current through the 100 000-Ω circuit of a circuit noise meter, connected between one or more telephone wires and ground. (PE) 599-1985w

noise transmission impairment (NTI) The noise transmission impairment that corresponds to a given amount of noise is the increase in distortionless transmission loss that would impair the telephone transmission over a substantially noise-free circuit by an amount equal to the impairment caused by the noise. Equal impairments are usually determined by judgment tests or intelligibility tests. (EEC/PE) [119]

noise, transverse-mode *See:* transverse-mode noise.

noise-voltage generator (interference terminology) A voltage generator the output of which is described by a random function of time. *Note:* At a specified frequency, a noise-voltage generator can often be adequately characterized by its mean-square voltage with the frequency increment Δf or by its spectral density. If the circuit contains more than one noise-current generator or noise-voltage generator, the correlation coefficients among the generators must be specified. *See also:* signal-to-noise ratio; signal; network analysis. (ED) 161-1971w

noise weighting (data transmission) In measurement of circuit noise, a specific amplitude frequency characteristic of a noise measuring set. It is designed to give numerical readings which approximate the amount of transmission impairment due to the noise, to an average listener, using a particular class of telephone subset. The noise weightings generally used were established by the agencies concerned with public telephone service and are based on characteristics of specific commercial telephone subsets, representing successive stages of technological development. The coding of commercial apparatus appears in the nomenclature of certain weightings. The same weighting nomenclature and units are used in the military versions and in the commercial noise measuring sets. (PE) 599-1985w

noise with tone, dBr*n* C-notched The measure of noise on a channel when a holding tone is present. A very narrow band elimination filter is used with a C-message filter to significantly reduce the level of the holding tone, and pass the noise in the remaining part of the channel. (COM/TA) 1007-1991r

no-load (rotating machinery) (adjective) The state of a machine rotating at normal speed under rated conditions, but when no output is required of it. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

no-load (excitation) losses (power and distribution transformers) Those losses that are incident to the excitation of the transformer. No-load (excitation) losses include core loss, dielectric loss, conductor loss in the winding due to exciting current, and conductor loss due to circulating current in parallel windings. These losses change with the excitation voltage. (PE/TR) C57.12.80-1978r

no-load field current (excitation systems for synchronous machines) The direct current in the field winding of the synchronous machine required to produce rated voltage at no-load and rated speed. (PE/EDPG) 421.1-1986r

no-load field voltage (excitation systems for synchronous machines) The voltage required across the terminals of the field winding of the synchronous machine under conditions of no-load, rated speed, and rated terminal voltage, and with the field winding at 25°C. (PE/EDPG) 421.1-1986r

no-load losses (1) Those losses that are incident to the excitation of the regulator. No-load losses include core loss, dielectric loss, conductor loss in the winding due to exciting current, and conductor loss due to circulating current in parallel windings. These losses change with the excitation voltage. *Synonym:* excitation losses. (PE/TR) C57.15-1999

(2) (power operations) Power losses in an electric facility when energized at rated voltage and frequency, but not carrying load. (PE/PSE) 858-1987s

(3) (electronic power transformer) The input power, expressed in watts, to a completely assembled transformer that is excited at rated terminal voltage and frequency, but not supplying load current. (PEL/ET) 295-1969r

no-load saturation curve (no-load characteristic) (of a synchronous machine) The saturation curve of a machine on no-load. (PE) [9]

no-load speed (of an electric drive) The speed that the output shaft of the drive attains with no external load connected and with the drive adjusted to deliver rated output at rated speed. *Note:* In referring to the speed with no external load connected and with the drive adjusted for a specified condition other than for rated output at rated speed, it is customary to speak of the no-load speed under the (stated) conditions. *See also:* electric drive. (IA/ICTL/IAC) [60]

no-load test (synchronous machines) A test in which the machine is run as a motor providing no useful mechanical output from the shaft. (PE) [9]

NOMAD A fourth-generation programming language that permits a wide latitude of generality in algebraic expressions. *Note:* Adapted from MAD. (C) 610.13-1993w

nomenclature (generating stations electric power system) (electric power system) The words and terms used to identify electric power systems. (PE/EDPG) 505-1977r

nomenclature standard A standard that describes the characteristics of a system or set of names, or designations, or symbols. (C) 610.12-1990

nominal A term used to describe functional behavior as being within expected norms, or as designed. (ATLAS) 1232-1995

nominal band of regulated voltage (synchronous machines) The band of regulated voltage for a load range between any load requiring no-load field voltage and any load requiring rated-load field voltage with any compensating means used to produce a deliberate change in regulated voltage inoperative. *See also:* direct-current commutating machine. (EEC/PE/EDPG) [119], 421-1972s

nominal battery voltage The voltage computed on the basis of 2.0 volts per cell for the lead-acid type and 1.2 volts per cell for the alkali type. (NESC/NEC) [86]

nominal collector ring voltage *See:* rated-load field voltage.

nominal conductor gradient (overhead-power-line corona and radio noise) The gradient determined for a smooth cylindrical conductor whose diameter is equal to the outside diameter of the actual (stranded) conductor. (T&D/PE) 539-1990

nominal control current (Hall generator) That value of control current that, if exceeded, will cause the linearity error of the device to exceed a rated magnitude. (MAG) 296-1969w

nominal discharge current (1) (arresters) The discharge current having a designated peak value and waveshape, that is used to classify an arrester with respect to protective characteristics. *Note:* It is also the discharge current that is used to initiate follow current in the operating duty test. (PE) [8]

(2) The discharge current that can be applied to a surge protective device a specified number of times without causing damage to it. The nominal discharge current is a peak surge current, with a wave shape of 8/20. (PE) C62.34-1996

nominal gas density The manufacturer's recommended operating gas density (usually expressed as pressure at 20°C). (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

nominal input power (loudspeaker measurements) Nominal input power is equal to the square of the true rms voltage at the input terminals of the loudspeaker, divided by the rated impedance. *See also:* rated impedance. 219-1975w

nonfirm power (power operations) (electric power system) Power supplied or available under an arrangement that does not have the availability feature of firm power. (PE/PSE) 858-1987s, 346-1973w

nominal line pitch (television) The average separation between centers of adjacent lines forming a raster. (BT/AV) 201-1979w

nominal line width (facsimile) The average separation between centers of adjacent scanning or recording lines. *See also:* recording; scanning. (COM) 168-1956w

nominal metallic impedance (measuring longitudinal balance of telephone equipment operating in the voice band) Impedance based on lumped constants of a metallic circuit at a single given frequency. (COM/TA) 455-1985w

nominal pull-in torque (synchronous motor) The torque it develops as an induction motor when operating at 95% of synchronous speed with rated voltage applied at rated frequency. *Note:* This quantity is useful for comparative purposes when the inertia of the load is not known. (PE) [9]

nominal rate of rise (1) (of an impulse) For a wavefront, the slope of the line that determines the virtual zero. It is usually expressed in volts or amperes per microsecond. (SPD/PE) C62.22-1997, C62.11-1999

(2) (of an impulse wavefront) The slope of the line that determines the virtual zero. It is usually expressed in volts or amperes per microsecond. (SPD/PE) C62.62-2000

nominal ratio *See:* marked ratio.

nominal synchronous-machine excitation-system ceiling voltage The ceiling voltage of the excitation system with:

1) The exciter and all rotating elements at rated speed.
2) The auxiliary supply voltages and frequencies at rated values.
3) The excitation system loaded with a resistor having a value equal to the resistance of the field winding to be excited at a temperature of: (A) 75°C for field windings designed to operate at rating with a temperature rise of 60°C or less, and (B) 100°C for field windings designed to operate at rating with a temperature rise greater than 60°C.
4) The manual control means adjusted as it would be to produce the rated voltage of the excitation system, if this manual control means is not under the control of the voltage regulator when the regulator is in service, unless otherwise specified. (The means used for controlling the exciter voltage with the voltage regulator out of service is normally called the manual control means.)
5) The voltage sensed by the synchronous machine voltage regulator reduced to give the maximum output from the regulator. Note that the regulator action may be simulated in test by applying to the field of the exciter under regulator control the maximum output developed by the regulator. (PE) [9]

nominal system voltage (1) (power and distribution transformers) The system voltage by which the system is designated and to which certain operating characteristics of the system are related. (The nominal voltage of a system is near the voltage level at which the system normally operates and provides a per-unit base voltage for system study purposes. To allow for operating contingencies, systems generally operate at voltage levels about 5 to 10 percent below the maximum system voltage for which system components are designed.) (PE/TR) C57.12.80-1978r

(2) (rotating electric machinery) A number used to denote the general level of voltage of the system described and, in the case of an externally powered system, selected from the list of preferred values below. (PE/EM) 11-1980r

(3) (electric power systems in commercial buildings) The voltage by which a portion of the system is designated, and to which certain operating characteristics of the system are related. Each nominal system voltage pertains to a portion of the system that is bounded by transformers or utilization equipment. (IA/PSE) 241-1990r

(4) The root-mean-square phase-to-phase voltage by which the system is designated and to which certain operating characteristics of the system are related. *Note:* The nominal system voltage is near the voltage level at which the system normally operates. To allow for operating contingencies, systems generally operate at voltage levels about five to ten percent below the maximum system voltage for which systems components are designed. (PE/C) 1313.1-1996

(5) A nominal value assigned to designate a system of a given voltage class. (SWG/PE/SPD) C37.100-1992, C62.22-1997, C62.11-1999, C62.62-2000

(6) A nominal value assigned to a system or circuit of a given voltage for the purpose of convenient designation. The term nominal voltage designates the line-to-line voltage, as distinguished from the line-to-neutral voltage. It applies to all parts of the system or circuit. (PE/TR) C57.15-1999

nominal thickness (cable element) (power distribution, underground cables) The specified, indicated, or named thickness. *Note:* In general, measured thicknesses will approximate but will not necessarily be identical with nominal thicknesses. (PE) [4]

nominal utilization voltage The voltage rating of certain utilization equipment used on the system. (IA/PSE) 241-1990r

nominal value (1) An arbitrary reference value selected to establish equipment ratings. (IA/PSE) 602-1996

(2) (metric practice) A value assigned for convenient designation; existing in name only. (SCC14/QUL) SI 10-1997, 268-1982s

nominal voltage (Vn) (1) A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600 etc.) The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment. (NESC/NEC/SPD/PE) C62.48-1995, [86]

(2) (of a system) A nominal value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. *Note:* The term "nominal voltage" designates the "line to line" voltage, as distinguished from the "line to neutral" voltage. It applies to all parts of the system or circuit. (PE/TR) C57.16-1996

(3) A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 208/120, 480/277, 600). (SCC22) 1346-1998

no motion A safety-critical function utilized to indicate that the train is at zero speed or sufficiently close to zero speed. Used to inhibit the ability of the doors to open when the train is moving and can be used for functions, such as emergency brake reset, that may require an indication of the no motion condition. (VT) 1475-1999

nonabsorbing state In a Markov chain model, a state that can be left once it is entered. *Contrast:* absorbing state. (C) 610.3-1989w

nonadjustable (as applied to Circuit Breakers) A qualifying term indicating that the circuit breaker does not have any adjustment to alter the value of current at which it will trip or the time required for its operation. (NESC/NEC) [86]

nonarithmetic shift *See:* logical shift.

nonatmospheric paths (atmospheric correction factors to dielectric tests) Paths, such as through a gas or vacuum sealed from the atmosphere, through a liquid such as oil, or through a solid, or a combination thereof. 579-1975w

nonautomatic Action requiring personal intervention for its control. As applied to an electric controller, nonautomatic control does not necessarily imply a manual controller, but only that personal intervention is necessary. *See also:* automatic. (NESC/NEC) [86]

nonautomatic extraction turbine (control systems for steam turbine-generator units) (condensing or noncondensing) Steam is extracted from one or more stages, but without means of controlling the pressure(s) of the extracted steam. (PE/EDPG) 122-1985s

nonautomatic opening The opening of a switching device only in response to an act of an attendant. *Synonym:* nonautomatic tripping. (SWG/PE) C37.100-1992

nonautomatic operation Operation controlled by an attendant. (SWG/PE) C37.100-1992

nonautomatic tripping *See:* nonautomatic opening.

nonbilling error Occurs when a call that should be billed is not billed due to switching system error. (COM/TA) 973-1990w

non-blind testing Testing of capabilities when the service laboratory is aware that they are being tested for conformance. (NI) N42.23-1995

nonblocking Executing with `POSIX_IO.Non_Blocking` set. When executing with `POSIX_IO.Non_Blocking` set, functions do not wait for protocol events (*e.g.*, acknowledgments) to occur before returning control. *See also:* blocking. (C) 1003.5-1999

nonblocking switching network (telephone switching systems) A switching network in which any idle outlet can always be reached from any given inlet under all traffic conditions. (COM) 312-1977w

nonbridging relay contacts A contact arrangement in which the opening contact opens before the closing contact closes. (EEC/REE) [87]

non-bus-based architecture A computer architecture that is not designed on a bus connection; for example, a crosspoint switch. *Contrast:* bus-based architecture. (C) 610.10-1994w

noncanonical input processing The processing of terminal input as uninterpreted characters. (C) 1003.5-1999

nonce A random or pseudo-random value used within an authentication system. (SCC32) 1455-1999

nonceramic insulator Insulators made from polymer materials. (T&D/PE) 957-1995

noncharacteristic harmonic (1) (harmonic control and reactive compensation of static power converters) Those harmonics which are not produced by semiconductor converter equipment in the course of normal operation. These may be the result of beat frequencies, a demodulation of characteristic harmonics and the fundamental, or unbalance in the ac power system or unsymmetrical delay angle. (IA/SPC) 936-1987w

(2) Harmonics that are not produced by semiconductor converter equipment in the course of normal operation. These may be a result of beat frequencies; a demodulation of characteristic harmonics and the fundamental; or an imbalance in the ac power system, asymmetrical delay angle, or cycloconverter operation. (IA/SPC) 519-1992

nonclock (test access port and boundary-scan architecture) A signal where the transitions between the low and high logic levels do not themselves cause operation of stored-state devices. The logic level is important only at the time of a transition on a clock signal. (TT/C) 1149.1-1990

noncode fire-alarm system A local fire-alarm system in which the alarm signal is continuous and is usually sounded by vibrating bells. *See also:* protective signaling. (EEC/PE) [119]

noncoherent moving-target indication A form of MTI radar in which a moving target is detected by using the clutter echo as the reference signal. *Notes:* 1. No internal reference signal is required. 2. Sometimes called externally coherent MTI. (AES) 686-1997

noncoherent MTI *See:* noncoherent moving-target indication.

noncoherent transaction A transaction (typically read or write) that is completed without checking for consistency with other caches on the local bus. For example, noncoherent 4-byte read and write transactions are used to access CSRs. Note that noncoherent transactions may be converted into coherent transaction sequences when passing through bus bridges. (C/MM) 1212-1991s

noncoincident demand The sum of the individual maximum demands regardless of time occurrence within a specified period. *See also:* alternating-current distribution. (PE/PSE) 858-1993w, 346-1973w

noncomposite color picture signal (national television system committee color television) The electric signal that represents complete color picture information but excludes line and field sync signals. (BT/AV) 201-1979w

nonconcurrent bus operation In dual bus systems "concurrent bus operation capable" describes buses capable of conducting simultaneous unrelated bus transactions. "Nonconcurrent bus operation capable" describes buses capable of conducting a transaction on only one bus at a time. (C/BA) 14536-1995

nonconducting Made of a material of high dielectric strength. (T&D/PE) 957-1995

nonconductive *See:* nonconducting.

nonconformance (1) (nuclear power quality assurance) A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate. (PE/NP) [124]

(2) A non-conformance is a deficiency in characteristic, documentation, or procedure which renders the quality of an item or service unacceptable or indeterminate. Any activity in the laboratory which adversely affects data quality can result in a nonconformance. (NI) N42.23-1995

nonconforming load (1) (electric power system) A customer load, the characteristics of which are such as to require special treatment in deriving incremental transmission losses. (PE/NP) 387-1984s

(2) (automatic generation control on electric power systems) A load that has characteristics dissimilar to those of the system load and that, depending on the modeling and/or control methodologies, may require special treatment. (PE/PSE) 94-1991w

nonconjunction The dyadic Boolean operation whose result has the Boolean value 0 if and only if each operand has the Boolean value 1. *Contrast:* conjunction. *See also:* NAND gate. (C) 610.10-1994w

noncontact plunger *See:* choke piston.

noncontinuous electrode A furnace electrode the residual length of which is discarded when too short for further effective use. *See also:* electrothermics. (EEC/PE) [119]

noncontinuous enclosure (1) A bus enclosure in which the consecutive sections of the enclosure for the same phase conductor are electrically insulated from each other, although each section is connected to ground. *Note:* This construction prevents longitudinal currents from flowing beyond each enclosure section. This design is no longer in common usage. (PE/SUB/SWG-OLD) C37.100-1992, C37.122-1993, C37.122.1-1993

(2) Refers to a type of isolated-phase bus in which the enclosure is sectionalized with insulation between sections to block the longitudinal flow of current in the enclosure. (PE/EDPG) 665-1987s

(3) A bus enclosure with the consecutive sections of the housing of the same phase conductor electrically isolated (or insulated from each other), so that no current can flow beyond each enclosure section. (PE/SUB) 80-2000

noncontinuously acting regulator (synchronous machines) A regulator that requires a sustained finite charge in the controlled variable to initiate corrective action. (PE/EDPG) 421.1-1986r, 421-1972s

noncooperative target recognition (NCTR) *See:* target recognition.

noncritical failure (test, measurement, and diagnostic equipment) Any failure that degrades performance or results in degraded operation requiring special operating techniques or alternative modes of operation which could be tolerated throughout a mission but should be corrected immediately upon completion of mission. (MIL) [2]

non-deliverable software product A software product that is not required by the contract to be delivered to the acquirer or other designated recipient. (C/SE) J-STD-016-1995

nondelivered source statements Source statements that are developed in support of the final product, but not delivered to the customer. (C/SE) 1045-1992

nondestructive addition (mathematics of computing) Addition performed on a computer in such a manner that the first operand placed in the arithmetic register is the augend. The addend is then added, and the sum becomes the new augend. *Contrast:* destructive addition. (C) 1084-1986w

nondestructive read (1) (accessed) A read operation that does not erase the data in the source location. *Contrast:* destructive read. *See also:* multiaperture core. (C) 610.10-1994w, 610.12-1990

(2) (magnetic cores) A method of reading the magnetic state of a core without changing its state. (Std100) 163-1959w

nondestructive reading (charge-storage tubes) Reading that does not erase the stored information. *See also:* charge-storage tube. (ED/MIL) 158-1962w, [2]

nondestructive testing (test, measurement, and diagnostic equipment) Testing of a nature which does not impair the usability of the item. (MIL) [2]

nondeveloped source statements Existing source statements that are reused or deleted. (C/SE) 1045-1992

non-deviative absorption Absorption that occurs in regions where the refractive index is close to unity (i.e., when radio ray bending is negligible). *Contrast:* deviative absorption. (AP/PROP) 211-1997

nondirected flow (oil-immersed forced-oil-cooled transformers) Indicates that the pumped oil from heat exchangers or radiators flows freely inside the tank, and is not forced to flow through the windings. (PE/TR) C57.91-1995

nondirectional beacon (NDB) (air navigation) (navigation aid terms) A radio facility which can be used with an airborne DF (direction finder) to provide a line of position. *Synonyms:* locator; H; H beacon; compass locator. (AES/GCS) 172-1983w

nondirectional microphone *See:* omnidirectional microphone.

nondisconnecting fuse An assembly consisting of a fuse unit or fuseholder and a fuse support having clips for directly receiving the associated fuse unit or fuseholder, which has no provision for guided operation as a disconnecting switch. (SWG/PE) C37.40-1993, C37.100-1992

nondisjunction The dyadic Boolean operation whose result has the Boolean value of 1 if and only if each operand has the Boolean value 0. *Synonym:* NEITHER-NOR. *Contrast:* disjunction. *See also:* NOR gate. (C) 610.10-1994w

nondispersive delay line A delay line that nominally has constant delay over a specified frequency band. The argument (phase) of the transfer function is a linear function of frequency. (UFFC) 1037-1992w, [22]

nondisruptive discharge A discharge between intermediate electrodes or conductors in which the voltage across the terminal electrodes is not reduced to practically zero. (PE/PSIM) 4-1995

nondisruptive test A test that is invoked through a write to the TEST_START register and does not disrupt the node's operation (the node does not enter the testing state). (C/MM) 1212-1991s

nonenclosed Not surrounded by a medium that will prevent a person accidentally contacting live parts. (PE/TR) C57.12.80-1978r

nonenclosed switches, indoor or outdoor Switches designed for service without a housing restricting heat transfer to the external medium. (SWG/PE) C37.100-1992

nonenergy-limiting transformer (power and distribution transformers) A constant-potential transformer that does not have sufficient inherent impedance to limit the output current to a thermally safe maximum value. *See also:* specialty transformer. (PE/TR) C57.12.80-1978r, [57]

nonequivalence The dyadic Boolean operation whose result has the Boolean value of 1 if and only if the operands have different Boolean values. *Contrast:* equivalence. *See also:* exclusive-OR gate; nonidentity. (C) 610.10-1994w

nonerasable storage *See:* fixed storage.

nonessential loads Those station auxiliary loads not immediately necessary to maintain full HVDC station output. (SUB/PE) 1158-1991r

no network response Occurs when a call attempt encounters a switching system trouble and the switching system does not notify the customer that the call cannot be completed. (COM/TA) 973-1990w

nonexposed installation (lightning) An installation in which the apparatus is not subject to overvoltages of atmospheric origin. *Note:* Such installations are usually connected to cable networks. (PE) [8], [84]

nongravitational acceleration (accelerometer) That component of the acceleration of an object that is caused by externally applied forces. In vector notation: $\vec{A} = \vec{G} + \vec{N}$ where $\vec{A}$ = kinematic acceleration; i.e., the second derivative of position with respect to time in inertial space; $\vec{G}$ = the acceleration due to gravity, the acceleration of an object that is allowed to fall freely in the local gravitational field; and $\vec{N}$ = nongravitational acceleration. Nongravitational acceleration is the force applied to an object, divided by its mass. For an accelerometer, it is the indicated acceleration, $\vec{A}_{ind} = \vec{N} = \vec{A} - \vec{G}$. A freely falling accelerometer ($\vec{A} = \vec{G}$) has no output, and a stationary accelerometer ($\vec{A} = 0$) indicates 1 *g* upward. (AES/GYAC) 528-1994

nongyroscopic angular sensor An inertial angular sensor whose functions do not depend on the angular momentum of a spinning rotor. (AES/GYAC) 528-1994

nonhoming (telephone switching systems) Resumption of a sequential switching operation from its last setting. (COM) 312-1977w

nonidentifying relationship A kind of specific (not many-to-many) relationship in which some or all of the attributes contained in the primary key of the parent entity do not participate in the primary key of the child entity. *Contrast:* identifying relationship. *See also:* mandatory nonidentifying relationship; optional nonidentifying relationship. (C/SE) 1320.2-1998

nonidentity The Boolean operation whose result has the Boolean value 1 if and only if all the operands do not have the same Boolean value. *Note:* A nonidentity operation on two

operands is a nonequivalence operation. *Contrast:* identity. (C) 610.10-1994w

nonidentity operation (mathematics of computing) A Boolean operation whose result is true if and only if not all of the operands have the same Boolean value. *Note:* A nonidentity operation on two operands is the same as an exclusive-OR operation. (C) 1084-1986w

nonimpact printer A printer in which printing is not the result of a mechanical contact with the printing medium. *Contrast:* impact printer. *See also:* magnetographic printer; ink jet printer; electrostatic printer; electrosensitive printer; thermal printer; xerographic printer. (C) 610.10-1994w

noninjecting contact (1) (x-ray energy spectrometers) (charged-particle detectors) (of a semiconductor radiation detector) A contact at which the carrier density in the adjacent semiconductor material is not changed from its equilibrium value. (NPS/NID) 759-1984r, 300-1988r

(2) (germanium gamma-ray detectors) (of a semiconductor radiation detector) A purely resistive contact, that is, one that has a linear voltage-current characteristic throughout its entire operating range. (NPS) 325-1986s

noninterference testing (test, measurement, and diagnostic equipment) A type of on-line testing that may be carried out during normal operation of the unit under test without affecting the operation. *See also:* interference testing. (MIL) [2]

noninterlaced Pertaining to a display device in which every line of pixels is refreshed on each pass. *Contrast:* interlaced. (C) 610.10-1994w

nonintrinsic relationship A kind of relationship that is partial, is multi-valued, or may change. *Contrast:* intrinsic relationship. (C/SE) 1320.2-1998

noninverting parametric device A parametric device whose operation depends essentially upon three frequencies, a harmonic of the pump frequency and two signal frequencies, of which one is the sum of the other plus the pump harmonic. *Note:* Such a device can never provide gain at either of the signal frequencies. It is said to be noninverting because if either of the two signals is moved upward in frequency, the other will move upward in frequency. *See also:* parametric device. (ED) [46]

nonislanding inverter An inverter that will cease to energize the utility line in ten cycles or less when subjected to a typical islanded load in which either of the following is true:

a) There is at least a 50% mismatch in real power load to inverter output (that is, real power load is $< 50\%$ or $> 150\%$ of inverter power output).
b) The islanded-load power factor is < 0.95 (lead or lag).

If the real-power-generation-to-load match is within 50% and the islanded-load power factor is > 0.95, then a nonislanding inverter will cease to energize the utility line within 2 s whenever the connected line has a quality factor of 2.5 or less. *Note:* See Annex A for a test procedure that identifies an inverter as a nonislanding inverter. (SCC21) 929-2000

nonisolated amplifier An amplifier that has an electrical connection between the signal circuit and another circuit including ground. (C) 610.10-1994w

nonkey attribute An attribute that is not the primary or a part of a composite primary key of an entity. (C/SE) 1320.2-1998

nonlinear The amplitude of the output is not linearly proportional to the input. If a true sine wave were transmitted through a nonlinear device, its shape would be changed. (PE/IC) 1143-1994r

nonlinear capacitor A capacitor having a mean-charge characteristic or a peak-charge characteristic that is not linear, or a reversible capacitance that varies with bias voltage. (ED) [46]

nonlinear circuit *See:* nonlinear network.

nonlinear data structure (data management) A nonprimitive data structure that can represent data that is multidimensional in nature. For example, a tree. *Contrast:* linear data structure. (C) 610.5-1990w

nonlinear devices Nonlinear processing, including automatic gain control (AGC) circuits and noise guards. (COM/TA) 1329-1999

nonlinear distortion (1) Distortion caused by a deviation from a desired linear relationship between specified measures of the output and input of a system. *Note:* The related measures need not to be output and input values of the same quantity: for example, in a linear detector the desired relation is between the output signal voltage and the input modulation envelope: or the modulation of the input carrier and the resultant detected signal. *See also:* close-talking microphone; distortion. (SP) 151-1965w

(2) The generation of new signal components not present in the original transmitted signal. (PE/IC) 1143-1994r

nonlinear element capacitance (varactor measurements) The capacitance of the high frequency equivalent series RC circuit. (ED) 318-1971w

nonlinear exponent (low voltage varistor surge arresters) A measure of varistor voltage nonlinearity between two given operating currents, expressed as $I = KV^{\alpha}$; where I is any current between the two operating currents I_1 and I_2; K is a device constant; V is the varistor voltage; and a is the logarithm of the ratio of the two operating currents (I_1/I_2) divided by the logarithm of the ratio of the varistor voltages at the two operating currents (V_2/V_1). (PE) [8]

nonlinear FM The modulation in a waveform whose phase variation with frequency has terms of order greater than two and, consequently, whose frequency varies in a nonlinear fashion with time (inside the specified envelope of the impulse response). (UFFC) 1037-1992w

nonlinear ideal capacitor An ideal capacitor whose transferred-charge characteristic is not linear. *See also:* nonlinear capacitor. (ED) [46]

nonlinearity (1) (x-ray energy spectrometers) (of a pulse amplifying system) Distortion caused by a deviation from a desired linear relationship between specified measures of the output and input pulse amplitudes of a system or device. (NPS/NID) 759-1984r

(2) (accelerometer) (gyros) The systematic deviation from the straight line that defines the nominal input-output relationship. (AES/GYAC) 528-1994

nonlinear load A load that draws a nonsinusoidal current wave when supplied by a sinusoidal voltage source. (IA/SPC/PSE) 519-1992, 1100-1999

nonlinear load current Load current that is associated with a nonlinear load. *See also:* nonlinear load. (IA/PSE) 1100-1999

nonlinear network (A) (signal-transmission system) A network (circuit) not specifiable by linear differential equations with time and/or position coordinates as the independent variable. *Note:* It will not operate in accordance with the superposition theorem. *See also:* signal; network analysis.

(B) (signal-transmission system) A network (circuit) in which the signal transmission characteristics depend on the input signal magnitude. *See also:* signal; network analysis. (IE) [43], 270-1966

nonlinear optimization *See:* nonlinear programming.

nonlinear programming (1) In operations research, a procedure for locating the maximum or minimum of a function of variables that are subject to constraints, when either the function or the constraints, or both, are nonlinear. *Synonym:* nonlinear optimization. *Contrast:* linear programming. *See also:* convex programming. (C) 610.2-1987

(2) Optimization problem in which any or all of the following are nonlinear in the variables:

a) The objective functions.
b) The defining interrelationships among the variables, the plant description.
c) The constraints.

See also: system. (SMC) [63]

nonlinear parameter A parameter dependent on the magnitude of one or more of the dependent variables or driving forces of the system. *Note:* Examples of dependent variables are current, voltage, and analogous quantities. (Std100) 270-1966w

nonlinear resistor-type arrester (valve type) An arrester having a single or a multiple spark gap connected in series with nonlinear resistance. *Note:* If the arrester has no series gap, the characteristic element limits the follow current to a magnitude that does not interfere with the operation of the system. *See also:* valve-type arrester. (PE) [8]

nonlinear scattering (fiber optics) Direct conversion of a photon from one wavelength to one or more other wavelengths. In an optical waveguide, nonlinear scattering is usually not important below the threshold irradiance for stimulated nonlinear scattering. *Note:* Examples are Raman and Brillouin scattering. *See also:* photon. (Std100) 812-1984w

nonlinear series resistor (arresters) The part of the lightning arrester that, by its nonlinear voltage-current characteristics, acts as a low resistance to the flow of high discharge currents thus limiting the voltage across the arrester terminals, and as a high resistance at normal power-frequency voltage thus limiting the magnitude of follow current. (PE) [8]

nonlinear system or element *See:* linear system or element.

nonlined construction (dry cell) (primary cell) A type of construction in which a layer of paste forms the only medium between the depolarizing mix and the negative electrode. *See also:* electrolytic cell. (PE/EEC) [119]

nonline frequency components (thyristor) Expressed by the frequency and the root-mean-square (rms) value of the components having a different frequency than the line frequency. (IA/IPC) 428-1981w

nonline frequency content (thyristor) The function obtained by subtracting the line frequency component from a nonsinusoidal periodic function. *Note:* For the case of asynchronous ON-OFF control, this function varies with time. (IA/IPC) 428-1981w

nonload-break connector A connector designed to be separated and engaged on de-energized circuits. (T&D/PE) 386-1977s

nonloaded (of an electric impedance) The value of Q of such impedance without external coupling or connection. (EEC/PE) [119]

nonlocking (data management) In code extension characters, having the characteristic that a change in interpretation applies only to a specified number of the coded representations following, commonly only one. *Contrast:* locking. (C) 610.5-1990w

nonlocking carabiner Has a self-closing gate which remains closed, but not locked, until intentionally opened by the user for connection or disconnection. (T&D/PE) 1307-1996

nonlocking gear train A power transmission gear train design that allows the power train to back-drive whenever the primary driving force is removed. (PE/NP) 1290-1996

nonlocking shift character (data management) A shift-out character that causes the character following it to be interpreted as a member of a different character set from the original set. *Contrast:* locking shift character. (C) 610.5-1990w

nonmagnetic relay armature stop A nonmagnetic member separating the pole faces of core and armature in the operated position, used to reduce and stabilize the pull from residual magnetism in release. (EEC/REE) [87]

nonmagnetic relay shim Sometimes used for relay armature stop, nonmagnetic. (EEC/REE) [87]

nonmagnetic ship A ship constructed with an amount of magnetic material so small that it causes negligible distortion of the earth's magnetic field. (EEC/PE) [119]

nonmechanical switching device A switching device designed to close or open, or both, one or more electric circuits by means other than by separable mechanical contacts. (SWG/PE) C37.100-1992

nonmetallic extensions An assembly of two insulated conductors within a nonmetallic jacket or an extruded thermoplastic covering. The classification includes both surface extensions, intended for mounting directly on the surface of walls or ceilings, and aerial cable, containing a supporting messenger cable as an integral part of the cable assembly. (NESC/NEC) [86]

nonmetallic-sheathed cable A factory assembly of two or more insulated conductors having an outer sheath of moisture-resistant, flame-retardant, nonmetallic material. (NESC/NEC) [86]

nonminimum phase function (linear networks) A network function that is not minimum-phase. *Contrast:* minimum-phase function. (CAS) [13]

nonmultiple switchboard (telephone switching systems) A telecommunications switchboard having each line connected to only one jack. (COM) 312-1977w

nonmultiple transit spurious signals Signals unrelated to the main signal delay by a simple integer and that may be labeled by their respective delay times (dispersive and nondispersive delay lines). (UFFC) 1037-1992w, [22]

non-NULL DATA packet A DATA packet other than a NULL packet. (TT/C) 1149.5-1995

nonnumerical action (switch) That action that does not depend on the called number (such as hunting an idle trunk). (PE/EEC) [119]

nonoperate value *See:* relay nonoperate value.

non-PCB transformer *See:* nonpolychlorinated biphenyl transformer.

non-permanent records Those records required to show evidence that an activity was performed in accordance with the applicable requirements but need not be retained for the life of the project. (NI) N42.23-1995

nonphantomed circuit A two-wire or four-wire circuit that is not arranged to form part of a phantom circuit. *See also:* transmission line. (EEC/PE) [119]

nonphysical primary color (color) (television) A primary represented by a point order outside the area of the chromaticity diagram enclosed by the spectrum locus and the purple boundary. *Note:* Nonphysical primaries cannot be produced because they require negative power at some wavelengths. However, they have properties that facilitate colorimetric calculation. (BT/AV) 201-1979w

nonplanar network A network that cannot be drawn on a plane without crossing of branches. *See also:* network analysis. (Std100) 270-1966w

nonpolarized electrolytic capacitor An electrolytic capacitor in which the dielectric film is formed adjacent to both metal electrodes and in which the impedance to the flow of current is substantially the same in both directions. (EEC/PE) [119]

non-polarized return-to-zero recording (RZ(NP)) Return-to-reference recording in which zeros are represented by the absence of magnetization, ones are represented by a specified condition of magnetization, and the reference condition is zero magnetization. The specified condition is usually saturation. Conversely, the absence of magnetization can be used to represent ones, and the magnetized condition to represent zeros. *Synonym:* dipole modulation. *Contrast:* polarized return-to-zero recording. (C) 610.10-1994w

nonpolychlorinated biphenyl transformer (liquid-filled power transformers) Transformers that contain less than 50 parts per million (ppm) PCB. No transformer may ever be considered to be a non-PCB transformer unless its dielectric fluid has been tested or otherwise verified to contain less than 50 ppm PCB. Examples: Transformers so identified. *Synonym:* non-PCB transformer.

nonpreferred ATLAS An ATLAS structure that has been rendered redundant by a later structure, but that is retained in the standard for upward compatibility. (ATLAS) 771-1989s

nonprime attribute (data management) An attribute that is not part of any candidate key of a relation. *Contrast:* prime attribute. (C) 610.5-1990w

nonprimitive data structure (data management) A structured set of primitive data structures. Structures may be linear, as in a vector, or nonlinear as in a tree. *Synonym:* complex data structure. *Contrast:* primitive data structure. *See also:* nonlinear data structure; linear data structure. (C) 610.5-1990w

nonprocedural language (software) A language in which the user states what is to be achieved without having to state specific instructions that the computer must execute in a given sequence. *Contrast:* procedural language. *See also:* interactive language; declarative language; rule-based language. (C) 610.12-1990, 610.13-1993w

nonprocedural programming language (software unit testing) A computer programming language used to express the parameters of a problem rather than the steps in an solution (for example, report writer or sort specification languages). *See also:* procedural programming language. (SE/C) 1008-1987r

nonprofessional projector Those types other than described under professional projector. (NESC/NEC) [86]

n-on-p solar cells (photovoltaic power system) Photovoltaic energy-conversion cells in which a base of p-type silicon (having fixed electrons in a silicon lattice and positive holes that are free to move) is overlaid with a surface layer of n-type silicon (having fixed positive holes in a silicon lattice with electrons that are free to move). *See also:* photovoltaic power system. (AES) [41]

nonquadded cable *See:* paired cable.

nonreactive power (A) (polyphase circuit) At the terminals of entry of a polyphase circuit, a vector equal to the (vector) sum of the nonreactive powers for the individual terminals of entry. *Note:* The nonreactive power for each terminal of entry is determined by considering each phase conductor and the common reference point as a single-phase circuit, as described for distortion power. The sign given to the distortion power in determining the nonreactive power for each single-phase circuit shall be the same as that of the total active power. Nonreactive power for a polyphase circuit has as its two rectangular components the active power and the distortion power. If the voltages have the same waveform as the corresponding currents, the magnitude of the nonreactive power becomes the same as the active power. Nonreactive power is expressed in volt-amperes when the voltages are in volts and the currents in amperes. **(B) (single-phase two-wire circuit)** At the two terminals of entry of a single-phase two-wire circuit into a delimited region, a vector quantity having as its rectangular components the active power and the distortion power. Its magnitude is equal to the square root of the difference of the squares of the apparent power and the amplitude of the reactive power. Its magnitude is also equal to the square root of the sum of the squares of the amplitudes of the active power and the distortion power. If voltage and current have the same waveform, the magnitude of the nonreactive power is equal to the active power. The amplitude of the nonreactive power is given by the equation

$$N = (U^2 - Q^2)^{1/2} = (P^2 + D^2)^{1/2}$$

$$= \left[\sum_{r=1}^{r=\infty} \sum_{q=1}^{q=\infty} [E_r^2 I_q^2 - E_r E_q I_r I_q \times \sin(\alpha_r - \beta_r) \sin(\alpha_q - \beta_q)] \right]^{1/2}$$

where the symbols are those in power, apparent (single-phase two-wire circuit). In determining the vector position of the nonreactive power, the sign of the distortion power component must be assigned arbitrarily. Nonreactive power is expressed in volt-amperes when the voltage is in volts and the current in amperes. *See also:* distortion power. (Std100) 270-1966

non-real-time service Any service function that does not require real time service. *See also:* real-time service. (DIS/C) 1278.2-1995

nonreciprocal A device or network that does not have the property of reciprocity. (CAS) [13]

nonreciprocal differential insertion phase (nonlinear, active, and nonreciprocal waveguide components) The difference between insertion phases in the two opposite directions of propagation between two ports of a junction. (MTT) 457-1982w

nonredundant UPS configuration *See:* nonredundant uninterruptible power supply configuration.

nonredundant uninterruptible power supply configuration Consists of one or more UPS modules operating in parallel with a bypass circuit transfer switch and a battery. (IA/PSE) 241-1990r

nonrelevant failure *See:* failure.

nonremovable disk *See:* fixed disk.

nonrenewable fuse (1) (one time) A fuse or fuse unit not intended to be restored for service after circuit interruption. *Synonyms:* nonrenewable fuse unit; one-time fuse. (SWG/PE) C37.100-1992

(2) A fuse unit that, after circuit interruption, cannot readily be restored for service. (SWG/PE) C37.40-1993

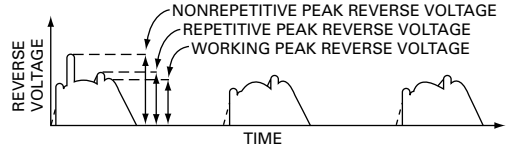
nonrenewable fuse unit *See:* nonrenewable fuse.

nonrepaired item An item that is not repaired after a failure. *See also:* reliability. (R) [29]

nonrepetitive peak line voltage (thyristor) The highest instantaneous value of any nonrepetitive transient line voltage. *Note:* The voltage V_{LSM} may originate from operating circuit breakers, atmospheric disturbances, etc. This kind of voltage may be minimized by the provision of surge suppression components. (IA/IPC) 428-1981w

nonrepetitive peak OFF-state voltage (thyristor) The maximum instantaneous value of any nonrepetitive transient OFF-state voltage that occurs across the thyristor. *See also:* principal voltage-current characteristic. (IA/ED) 223-1966w, [12], [46], [62]

nonrepetitive peak reverse voltage rating (rectifier circuits) (semiconductor rectifiers) The maximum value of non-repetitive peak reverse voltage permitted by the manufacturer under stated conditions. *See also:* average forward current rating.



nonrepetitive peak reverse voltage rating

(IA) 59-1962w

nonrepetitive transient reverse voltage (1) (reverse-blocking thyristor) The maximum instantaneous value of any unrepetitive transient reverse voltage that occurs across a thyristor. *See also:* principal voltage-current characteristic. (IA) [62]

(2) (semiconductor rectifiers) The maximum instantaneous value of the reverse voltage, including all nonrepetitive transient voltages but excluding all repetitive transient voltages, that occurs across a semiconductor rectifier cell, rectifier diode, or rectifier stack. *See also:* semiconductor rectifier stack; rectification. (IA) 59-1962w

nonrequired time (availability) The period of time during which the user does not require the item to be in a condition to perform its required function. (R) [29]

nonrestorable fire detector (fire protection devices) A device whose sensing element is designed to be destroyed by the process of detecting a fire. (NFPA) [16]

nonreturn-to-reference recording The magnetic recording of binary characters such that patterns of magnetization used to represent zeros and ones occupy the whole storage cell, with

no part of the cell magnetized to a reference condition. *Contrast:* return-to-reference recording. *See also:* nonreturn-to-zero (change) recording. (C) 610.10-1994w

nonreturn to zero (NRZ) (1) (magnetic tape pulse recorders for electricity meters) A method whereby a pulse is recorded on the magnetic tape by a polarity reversal of the recording head current. (ELM) C12.14-1982r

(2) A signaling technique in which a polarity level high represents a logical "1" (one) and a polarity level low represents a logical level "0" (zero). (C/MM) 1394-1995

nonreturn to zero code (power-system communication) A code form having two states termed zero and one, and no neutral or rest condition. *See also:* digital. (PE) 599-1985w

Non-Return-to-Zero, Invert on Ones (NRZI) An encoding technique used in FDDI where a polarity transition represents a logical ONE. The absence of a polarity transition denote a logical ZERO. (C/LM) 802.3-1998

Non-Return-to-Zero, Invert on Ones (NRZI)-bit A code-bit transferred in NRZI format. The unit of data passed across the Physical Medium Dependent (PMD) service interface in 100BASE-X. (C/LM) 802.3-1998

nonreturn-to-zero (change) recording (NRZ(C)) (1) Non-return-to-reference recording in which the reference condition is zero magnetization. (C) 610.10-1994w

(2) Non-return-to-reference recording in which zeros are represented by magnetization to a specified condition, and ones are represented by magnetization to a specified alternative condition. The two conditions may be saturation and zero magnetization but are more commonly saturation in opposite senses. This method is called "change recording" because the recorded magnetic condition is changed when, and only when, the recorded binary character changes from zero to one or from one to zero. (C) 610.10-1994w

nonreversible output *See:* maximum test output voltage (magnetic amplifier).

nonreversible power converter (semiconverter) An equipment containing assemblies of mixed power thyristor and diode devices that is capable of transferring energy in only one direction (that is, from the alternating-current side to the direct-current side). *See also:* power rectifier. (IA) [62]

nonreversing A control function that provides for operation in one direction only. *See also:* feedback control system. (IA/ICTL/IAC/APP) [60], [75]

nonsalient pole (rotating machinery) The part of a core, usually circular, that by virtue of direct-current excitation of a winding embedded in slots and distributed over the interpolar (and possibly over some or all of the polar) space, acts as a pole. *See also:* asynchronous machine. (PE) [9]

nonsaturation region of an insulated-gate field-effect transistor (metal-nitride-oxide field-effect transistor) (the acronym for insulated-gate field-effect transistor is IGFET) A portion of the I_{DS} versus V_{DS} characteristic where I_{DS} is strongly dependent on V_{DS}. This is true when $0 < V_{DS} < V_{GS} - V_T$. (ED) 581-1978w

nonsealed system A system in which a tank or compartment is vented to the atmosphere, usually with two breather openings to permit circulation of air across the gas space above the oil. Circulation can be made unidirectional when a pipe is extended up through the oil and is heated by the oil to induce movement of air drawn from the outside into the gas space and across the oil to a breather on top of the tank. (PE/TR) C57.15-1999

nonsegregated-phase bus (1) One in which all phase conductors are in a common metal enclosure without barriers between the phases. *Note:* When associated with metal-clad switchgear, the primary bus conductors and connections are covered with insulating material throughout. (SWG/PE/EDPG) 665-1995

(2) A bus in which all phase conductors are in a common metal enclosure without barriers between the phases. *Note:* When associated with metal-clad switchgear, the primary bus conductors and connections are covered with insulating material throughout. (SWG/PE) C37.100-1992

nonselective collective automatic operation (elevators) Automatic operation by means of one button in the car for each landing level served and one button at each landing, wherein all stops registered by the momentary actuation of landing or car buttons are made irrespective of the number of buttons actuated or of the sequence in which the buttons are actuated. *Note:* With this type of operation the car stops at all landings for which buttons have been actuated, making the stops in the order in which the landings are reached after the buttons have been actuated, but irrespective of its direction of travel. *See also:* control. (EEC/PE) [119]

nonself-maintained discharge (gas) A discharge characterized by the fact that the charged particles are produced solely by the action of an external ionizing agent. *See also:* discharge. (ED) [45], [84]

non-self-restoring insulation (1) Insulation that loses its insulating properties or does not recover them completely after a disruptive discharge. (PE/PSIM) 4-1995

(2) (power and distribution transformers) An insulation that loses its insulating properties or does not recover them completely after a disruptive discharge caused by the application of a test voltage; insulation of this kind is generally, but not necessarily, internal insulation. (SPD/PE/C/SWG-OLD/TR) C62.22-1997, 1313.1-1996, C37.100-1992, C57.12.80-1978r

nonsequential computer A computer that must be directed to the location of each instruction. *See also:* arbitrary sequence computer. (C) 610.10-1994w

nonshield insulated splice (power cable joints) An insulated splice in which no conducting material is employed over the insulation for electric stress control. (PE/IC) 404-1986s

nonshorting cap A device that provides an open circuit between line and load when a photocontrol is not used. (RL) C136.10-1996

nonsignificant code (data management) A code that identifies a particular item but does not yield further information about the properties or classification of the item. *Contrast:* significant code. (C) 610.5-1990w

non-source routed (NSR) Indicates that the frame does not make use of a routing information field (i.e., the RIF is null and the RII is not set). (C/LM/CC) 8802-2-1998

nonspecific subordinate reference A knowledge reference that holds information about a DSA that holds one or more unspecified subordinate entries. (C/PA) 1327.2-1993w, 1224.2-1993w, 1328.2-1993w, 1326.2-1993w

nonspinning reserve (power operations) (electric power supply) That operating reserve capable of being connected to the bus and loaded within a specified time. (PE/PSE) 858-1987s, 346-1973w

nonstop switch (elevators) A switch that, when operated, will prevent the elevator from making registered landing stops. *See also:* control. (PE/EEC) [119]

nonstorage display (display storage tubes) Display of nonstored information in the storage tube without appreciably affecting the stored information. *See also:* storage tube. (ED) 158-1962w

nonsustained disruptive discharge A momentary disruptive discharge. (PE/PSIM) 4-1995

nonsynchronous *See:* asynchronous.

nonsynchronous (interdigital) transducer An interdigital transducer that has nonuniform electrode center-to-center spacing. (UFFC) 1037-1992w

nonsynchronous transmission (data transmission) A transmission process so that between any two significant instants in the same group, there is always an integral number of unit intervals. Between two significant instants located in different groups, there is not always an integral number of unit intervals. *Note:* In data transmission, this group is a block or a

character. In telegraphy, this group is a character. (PE) 599-1985w

nonsystematic jitter *See:* uncorrelated jitter.

nonterminal node (data management) In a tree, a node that can have one or more subtrees. *Synonyms:* branch node; internal node. *Contrast:* terminal node. *See also:* root node. (C) 610.5-1990w

no-test trunk access method Used to connect to an end user's line, the no-test trunk access method contains a direct metallic path and is primarily used for loop and customer premise equipment (CPE) testing purposes. (SCC31) 1390.3-1999

nonthermal fire hazard A hazard resulting from combustion products (such as smoke and toxic and corrosive fire products). (DEI) 1221-1993w

nontouching loop set (network analysis) A set of loops no two of which have a common node. (CAS) 155-1960w

nontransitive dependency A type of dependency among attributes in a relation, in which a nonprime attribute A is said to be nontransitively dependent on another attribute B if and only if A is dependent on B, and there is another attribute C that is functionally dependent on B but does not functionally determine A. *Contrast:* transitive dependency. (C) 610.5-1990w

nonuniformity (transmission lines and waveguides) The degree with which a characteristic quantity, for example, impedance, deviates from a constant value along a given path. *Note:* It may be defined as the maximum amount of deviation from a selected nominal value. For example, the nonuniformity of the characteristic impedance of a slotted coaxial line may be 0.05 ohm due to dimensional variations. (IM/HFIM) [40]

non-utility generator A facility for generating electricity that is not exclusively owned by an electric utility and that operates connected to an electric utility system. (PE/PSE) 858-1993w

nonvented fuse (or fuse unit) A fuse without intentional provision for the escape of arc gases, liquids, or solid particles to the atmosphere during circuit interruption. (SWG/PE) C37.40-1993, C37.100-1992

nonvented power fuse (installations and equipment operating at over 600 volts, nominal) A fuse without intentional provision for the escape of arc gases, liquids, or solid particles to the atmosphere during circuit interruption. (NESC/NEC) [86]

nonventilated (power and distribution transformers) So constructed as to provide no intentional circulation of external air through the enclosure. (PE/TR) C57.12.80-1978r

nonventilated dry-type transformer (power and distribution transformers) (dry-type general purpose distribution and power transformers) A dry-type transformer which is so constructed as to provide no intentional circulation of external air through the transformer, and operating at zero gauge pressure. (PE/TR) C57.94-1982r, C57.12.80-1978r

nonventilated enclosure An enclosure so constructed as to provide no intentional circulation of external air through the enclosure. *Note:* Doors or removable covers are usually gasketed and humidity control may be provided by filtered breathers. (SWG/PE) C37.100-1992, C37.23-1987r

nonvolatile memory (1) A memory in which the data content is retained when power is no longer supplied to it. (ED) 641-1987w, 1005-1998

(2) Memory whose contents are retained after power has been shut off. (C/BA) 14536-1995

(3) Computer memory whose contents are preserved when the system power is off. (C/BA) 1275-1994

(4) Memory that retains its contents even through power failures. (C/MM) 1596-1992

(5) Read/write storage that is preserved through losses of power. (C/MM) 1212-1991s

nonvolatile random-access memory (NVRAM) A semi-permanent type of data storage (memory) that is backed up by batteries to maintain stored data even if system power is lost. Can be both read and changed by the system. (PE/SUB) 1379-1997

nonvolatile storage (1) (test, measurement, and diagnostic equipment) A storage device which can retain information in the absence of power. Contrast to volatile storage. (MIL) [2]

(2) A type of storage whose contents are not lost when power is lost. *Contrast:* volatile storage. *See also:* erasable storage; bubble memory. (C) 610.10-1994w

no-op *See:* no-operation.

no-operation (no-op) (1) (computers) An instruction that specifically instructs the computer to do nothing, except to proceed to the next instruction in sequence. *Synonym:* no-op. (C) [20], [85]

(2) (software) A computer operation whose execution has no effect except to advance the instruction counter to the next instruction. Used to reserve space in a program or, if executed repeatedly, to wait for a given event. Often abbreviated no-op. *Synonyms:* no-op; do-nothing operation. (C) 610.12-1990

no-op instruction *See:* dummy instruction.

NOR (1) (mathematics of computing) A Boolean operator having the property that if P is a statement, Q is a statement, R is a statement, . . . , then the NOR of P,Q,R,. . . is true if and only if all statements are false. *Note:* P NOR Q is often represented by P ↓ Q. *Synonym:* nondisjunction.

P	Q	P ↓ Q
0	0	1
0	1	0
1	0	0
1	1	0

NOR truth table

(C) 1084-1986w

(2) (software) *See also:* notice of revision. (C) 610.12-1990

NOR element *See:* NOR gate.

NOR gate A gate that performs the Boolean operation of nondisjunction. *Synonyms:* inclusive NOR gate; NOR element; NOT-OR. *See also:* OR gate. (C) 610.10-1994w

norator A two-terminal ideal element the current through which and the voltage across which can each be arbitrary. (CAS) [13]

normal (1) (state of a superconductor) The state of a superconductor in which it does not exhibit superconductivity. Example: Lead is normal at temperatures above a critical temperature. *See also:* superconductivity; superconducting. (ED) [46]

(2) (power generation) *See also:* preferred.

(3) *See also:* interference, normal-mode; normal-mode interference. (SUB/PE) C37.1-1994

normal base current Rated current of a transformer corresponding to its rated voltage and rated base kilovoltamperes. (PE/TR) C57.109-1993

normal base power transfers (power operations) Those power transfers that are considered to be a part of normal base system loadings for the condition being analyzed. Other transfers, such as emergency power or opportunistic economy energy transfers, are excluded even though they may be provided for in contractual arrangements. (PE/PSE) 858-1987s

normal binary *See:* binary.

normal character (N_char) N_chars represent, at the minimum, the 256 values of a byte (i.e., all the data characters) plus a control character representing an end_of_packet marker. (C/BA) 1355-1995

normal clear A term used to express the normal indication of the signals in an automatic block system in which an indication to proceed is displayed except when the block is occupied. *See also:* centralized traffic-control system. (EEC/PE) [119]

normal clear system *See:* normal clear.

normal contact A contact that is closed when the operating unit is in the normal position. (EEC/PE) [119]

normal (through) dielectric heating applications The metallic electrodes are arranged on opposite sides of the material so that the electric field is established through it. *Note:* The electrodes may be classified as plate electrodes, roller electrodes, or concentric electrodes.

1) Plate electrodes may have plane surfaces or surfaces of any desired shape to meet a particular condition and the spacing between them may be uniform or varied.
2) Roller electrodes are rollers separated by the material which moves between them.
3) Concentric electrodes consist of an enclosed and a surrounding electrode, with the material placed between the two.

(IA) 54-1955w

normal dimension Incremental dimensions whose number of digits is specified in the format classification. For example, the format classification would be plus 14 for a normal dimension: X.XXXX. *See also:* incremental dimension; long dimension; dimension; short dimension. (IA) [61]

normal distribution *See:* Gaussian distribution.

normal effort (electric generating unit reliability, availability, and productivity) Repairs were carried out with normal repair crews working normal shifts. *See also:* repair urgency. (PE/PSE) 762-1987w

normal float A constant-potential charge application to a battery to maintain it in a charged condition. (PE/EDPG) 1106-1987s

normal form (data management) The form of a data structure, relation, or database that has been reduced to a simpler, more stable form than it was in its unnormalized form. *See also:* fourth normal form; Boyce/Codd Normal form; second normal form; first normal form; third normal form; projection/join normal form. (C) 610.5-1990w

normal frequency The frequency at which a device or system is designed to operate. (SWG/PE) C37.100-1992, C37.34-1994

normal-frequency dew withstand voltage (1) The normal-frequency withstand voltage applied to insulation completely covered with condensed moisture. *See also:* normal-frequency withstand voltage. (SWG/PE) C37.100-1992

(2) The root-mean-square (rms) voltage that can be applied to an insulator or a device, completely covered with condensed moisture, under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1981s

normal-frequency dry withstand voltage (1) The normal-frequency withstand voltage applied to dry insulation. *See also:* normal-frequency withstand voltage. (SWG/PE) C37.100-1992

(2) The root-mean-square (rms) voltage that can be applied to a dry device under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1981s

normal-frequency line-to-line recovery voltage The normal-frequency recovery voltage, stated on a line-to-line basis, that occurs on the source side of a three-phase circuit-interrupting device after interruption is complete in all three poles. (SWG/PE) C37.100-1992

normal-frequency pole-unit recovery voltage The normal-frequency recovery voltage that occurs across a pole unit of a circuit-interrupting device upon circuit interruption. (SWG/PE) C37.100-1992

normal-frequency wet withstand voltage (1) The normal-frequency withstand voltage applied to wetted insulation. *See also:* normal-frequency withstand voltage. (SWG/PE) C37.100-1992

(2) The root-mean-square (rms) voltage that can be applied to a wetted device under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1981s

normal-frequency recovery voltage The normal-frequency root-mean-square (rms) voltage that occurs across the terminals of an ac circuit-interrupting device after the interruption of the current and after the high-frequency transients have subsided. *Note:* For determination of the normal-frequency recovery voltage, see IEEE C37.09-1979. (SWG/PE) C37.40-1981s, C37.100-1992

normal-frequency withstand voltage The normal-frequency voltage that can be applied to insulation under specified conditions for a specified time without causing flashover or puncture. *Note:* This value is usually expressed as a root-mean-square (rms) value. *See also:* normal-frequency wet withstand voltage; normal-frequency dry withstand voltage; normal-frequency dew withstand voltage. (SWG/PE) C37.100-1992

normal gas density The manufacturer's recommended operating gas density (usually expressed as a pressure at 20°C). (SUB/PE) C37.122-1993

normal-glow discharge (gas) The glow discharge characterized by the fact that the working voltage decreases or remains constant as the current increases. *See also:* discharge. (ED) [45], [84]

normal induction (magnetic material) The maximum induction in a magnetic material that is in a symmetrically cyclically magnetized condition. (Std100) 270-1966w

normalization (1) (A) (data management) The process of decomposing and restructuring a complex data structure in order to reduce the structure to a simpler, more stable form. *Note:* Such a data structure is said to be in "normal form." **(B) (data management)** The process of reducing a relation to its simplest form such that each attribute is derived from a single domain consisting of nondecomposable values. (C) 610.5-1990

(2) The decomposition of more complex data structures according to a set of rules designed to give simpler, more stable structures. (PE/EDPG) 1150-1991w

normalization transformation *See:* viewing transformation.

normalize (1) (A) (data management) In database design, to reduce a data structure, relation, or database to a simpler, more stable form. *Synonym:* standardize. *See also:* normal form; normalized form. **(B) (data management)** To alter or position data into a standard format, as in justification of text. **(C) (data management)** To adjust the exponent and mantissa of floating-point data such that the mantissa lies in a standard range. *See also:* normalized form. (C) 610.5-1990

(2) (mathematics of computing) To shift the fixed-point part of a floating-point number, and make the corresponding adjustment to the exponent, to ensure that the fixed-point part lies within some prescribed range. The number represented remains unchanged. *Synonym:* standardize. (C) 1084-1986w

(3) (A) (test, measurement, and diagnostic equipment) To adjust the characteristic and fraction of a floating decimal point number thus eliminating leading zeros in the fraction. **(B) (test, measurement, and diagnostic equipment)** To adjust a measured parameter to a value acceptable to an instrument or measurement technique. (MIL) [2]

(4) To divide an impedance or frequency by a reference quantity thereby making the result dimensionless. (CAS) [13]

normalized admittance (waveguide) The reciprocal of the normalized impedance. (MTT) 146-1980w

normalized amplitude The amplitude of a signal when driving its steady-state value; i.e., not under the influence of ringing or other dynamic influences. (C/LM) 802.3-1998

normalized device coordinate system A device-independent coordinate system in which all coordinate values are normalized to values between 0 and 1. *Note:* The world coordinate system is mapped to the normalized device coordinate system by a viewing transformation. (C) 610.6-1991w

normalized directivity *See:* antenna [aperture] illumination efficiency.

normalized form (A) (data management) In database design, the form assumed by data that have been normalized. *Contrast:* unnormalized form. *See also:* normal form. **(B) (data management)** The form taken by a floating-point representation when the fixed-point part lies within some standard range, so chosen that any given real number can be represented by a unique pair of numerals. Examples below illustrate real data and their corresponding normalized form such that the fixed-point portion is in the form x.xxx.

$0.123 * 10^4 = 1.23 * 10^3$

$0.999 * 10^{-1} = 9.99 * 10^{-2}$

(C) 610.5-1990

normalized frequency (fiber optics) A dimensionless quantity (denoted by V), given by

$$V = \frac{2\pi a}{\lambda}\sqrt{n_1^2 - n_2^2}$$

where a is waveguide core radius, λ is wavelength in vacuum, and n_1 and n_2 are the maximum refractive index in the core and refractive index of the homogeneous cladding, respectively. In a fiber having a power-law profile, the approximate number of bound modes is $(V^2/2)[g/(g + 2)]$, where g is the profile parameter. *Synonym:* V number. *See also:* single mode optical waveguide; bound mode; mode volume; power-law index profile; parabolic profile. (Std100) 812-1984w

normalized impedance (1) (waveguide) The ratio of an impedance and the corresponding characteristic impedance. *Note:* The normalized impedance is independent of the convention used to define the characteristic impedance, provided that the same convention is also taken for the impedance to be normalized. (MTT) 146-1980w

(2) The ratio of an impedance to a specified reference impedance. *Note:* For a transmission line or a waveguide, the reference impedance is usually a characteristic impedance. (IM/HFIM) [40]

normalized peak error Peak error divided by three times the standard deviation of the differences discussed in 4.5.1.1. *See also:* peak error. (IM/WM&A) 1057-1994w

normalized peak ESD current Ratio of the peak current to the charge voltage (e.g., 5A/kV). (SPD/PE) C62.47-1992r

normalized plateau slope (radiation counter tubes) The slope of the substantially straight portion of the counting rate versus voltage characteristic divided by the quotient of the counting rate by the voltage at the Geiger-Mueller threshold. (ED) 161-1971w

normalized relation *Contrast:* unnormalized relation. *See also:* relation; normalize. (C) 610.5-1990w

normalized response (automatic control) One obtained by dividing a measured value and dimension by some convenient reference value and dimension; usually the quotient is nondimensional. (PE/EDPG) [3]

normalized rising slope Ratio of the initial slope to the charge voltage (e.g., 3.75 A/ns/kV). (SPD/PE) C62.47-1992r

normalized site attenuation (NSA) Site attenuation divided by the antenna factors of the radiating and receiving antennas (all in linear units). (EMC) C63.5-1988, C63.4-1991

normalized transimpedance (magnetic amplifier) The ratio of differential output voltage to the product of differential control current and control winding turns. (MAG) 107-1964w

normal joint (power cable joints) A joint which is designed not to restrict movement of dielectric fluid between cables being joined. (PE/IC) 404-1986s

normal lightning current Lightning currents of 65 kA or less. (SPD/PE) C62.11-1999

normal linearity (computers) Transducer linearity defined in terms of a zero-error reference, that is chosen so as to minimize the linearity error. *Note:* In this case, the zero input does not have to yield zero output and full-scale input does not have to yield fullscale output. The specification of normal linearity, therefore, is less stringent than zero-based linearity. *See also:* linearity of a multiplier; electronic analog computer. (C) 165-1977w

Normal Link Pulse (NLP) An out-of-band communications mechanism used in 10BASE-T to indicate link status. (C/LM) 802.3-1998

Normal Link Pulse Receive Link Integrity Test function A test function associated with Auto-Negotiation that allows backward compatibility with the 10BASE-T Link Integrity Test function of IEEE 802.3. (C/LM) 802.3-1998

normally closed *See:* normally open and normally closed.

normally closed contact A contact, the current-carrying members of which are in engagement when the operating unit is in its normal position. (EEC/PE) [119]

normally closed relay contacts A contact pair that is closed when the coil is not energized. (EEC/REE) [87]

normally open and normally closed When applied to a magnetically operated switching device, such as a contactor or relay, or to the contacts thereof, these terms signify the position taken when the operating magnet is deenergized. Applicable only to nonlatching types of devices. *See also:* contactor. (IA/ICTL/IAC) [60]

normally open contact (open contact) A contact, the current-carrying members of which are not in engagement when the operating unit is in the normal position. *Synonym:* open contact. (EEC/PE) [119]

normally open relay contacts A contact pair that is open when the coil is not energized. (EEC/REE) [87]

normal-mode (1) (transverse or differential) The voltage that appears differentially between two signal wires and that acts on the circuit in the same manner as the desired signal. (PE/IC) 1143-1994r

(2) *See also:* normal-mode interference. (SUB/PE) C37.1-1994

normal-mode interference (signal-transmission system) A form of interference that appears between measuring circuit terminals. *See also:* differential-mode interference; accuracy rating. (EEC/SUB/PE/EMI) [112], C37.1-1994

normal-mode noise (1) (transverse or differential) The noise voltage which appears differentially between two signal wires and which acts on the signal sensing circuit in the same manner as the desired signal. (SUB/PE) 525-1992r

(2) (cable systems in power generating stations) (instrumentation and control equipment grounding in generating stations) (transverse or differential) The noise voltage that appears differentially between two signal wires and acts on the signal sensing circuit in the same manner as the desired signal. Normal mode noise maybe caused by one or more of the following:

a) electrostatic induction and differences in distributed capacitance between the signal wires and the surroundings;
b) electromagnetic induction and magnetic fields linking unequally with the signal wires;
c) junction or thermal potentials due to the use of dissimilar metals in the connection system;
d) common mode to normal mode noise conversion.

(PE/C/EDPG) 1050-1989s, 166-1977w

(3) *See also:* transverse-mode noise. (IA/PSE) 1100-1999

normal mode signal (or differential signal) The difference between the signal at the positive input and the negative input of a differential input waveform recorder. If the signal at the positive input is designated V+, and the signal at the negative input is designated V-, then the normal mode (or differential) signal (Vdm) is

$$V_{dm} = V+ - V-$$

(IM/WM&A) 1057-1994w

normal number (radix-independent floating-point arithmetic) (mathematics of computing) A non-zero number that is finite and not subnormal. (MM/C) 854-1987r, 1084-1986w

normal operating conditions The environmental stresses and operating stresses, such as voltage, current loading, or mechanical loading, encountered in normal service, including anticipated overloads and periodic testing but not including accidents or other extraordinary events. (DEI/RE) 775-1993w

normal operating load Any equipment operation that can reasonably be expected to occur during an earthquake, except short-circuit loads, that produces a force, stress, or load. (PE/SUB) 693-1997

normal operations area (nuclear power generating station) A functional area allocated for those displays and controls necessary for the tasks routinely performed during plant startup, shutdown and power operation modes. (PE/NP) 566-1977w

normal permeability The ratio of normal induction to the corresponding maximum magnetizing force. *Note:* In anisotropic media, normal permeability becomes a matrix. (Std100) 270-1966w

normal position (of a device) A predetermined position that serves as a starting point for all operations. (EEC/PE) [119]

normal random number (mathematics of computing) Any member of a random number sequence that has a normal, or Gaussian, distribution. (C) 1084-1986w

normal rating (1) The level of power flow that facilities can carry through a series of daily load cycles without loss of life to the facility involved. (PE/PSE) 858-1993w **(2)** Capacity of installed equipment. (PE/PSE) 346-1973w

normal response mode (NRM) The secondary station (a DCC) initiates transmission only after receiving express permission to do so from the primary station (the BCC). (EMB/MIB) 1073.3.1-1994

normal stop system A term used to describe the normal indication of the signals in an automatic block signal system in which the indication to proceed is given only upon the approach of a train to an unoccupied block. *See also:* centralized traffic-control system. (EEC/PE) [119]

normal-terminal stopping device (elevators) A device, or devices, to slow down and stop an elevator or dumbwaiter car automatically at or near a terminal landing independently of the functioning of the operating device. *See also:* control. (PE/EEC) [119]

normal test output (A) (amplitude-modulation broadcast receivers) For receivers capable of delivering at least 1 watt maximum undistorted output, the normal test output is an audio-frequency power of 0.5 watt delivered to a standard dummy load. **(B) (amplitude-modulation broadcast receivers)** For receivers capable of delivering 0.1 but less than 1 watt maximum undistorted output, the normal test output 0.05 watt audio-frequency power delivered to a standard dummy load. When this value is used, it should be so specified. Otherwise, the 0.5-watt value is assumed. **(C) (amplitude-modulation broadcast receivers)** For receivers capable of delivering less than 0.1 watt maximum undistorted output, the normal test output is 0.005 watt audio-frequency power delivered to a standard dummy load. When this value is used, it should be so specified. **(D) (amplitude-modulation broadcast receivers)** For automobile receivers, normal test output is 1.0 watt audio-frequency power delivered to a standard dummy load. (CE) 186-1948

normal transfer capability (power operations) The maximum amount of power that can be transmitted continuously over the transmission network. (PE/PSE) 858-1987s

normal velocity storage (accelerometer) (digital accelerometer) The velocity information that is stored in the accelerometer during the application of an acceleration within its input range. (MTT/AES/GYAC) 457-1982w, 528-1994

normal voltage limit (power operations) The voltage range that is acceptable on a sustained basis. *See also:* emergency voltage limit. (PE/PSE) 858-1987s

normal weather (1) Includes all weather not designated as adverse or major storm disaster. (PE/PSE) [54], 859-1987w, 346-1973w **(2) (electric power system)** All weather not designated as adverse. *See also:* outage. (PE/PSE) [54], 859-1987w

normal weather forced outage rate The number of forced outages per unit of service time in normal weather = number of forced outages during normal weather/service time during normal weather. *See also:* outage rate. (PE/PSE) 859-1987w

normal weather persistent-cause forced-outage rate (electric power system) (for a particular type of component) The mean number of outages per unit of normal weather time per component. *See also:* outage. (PE/PSE) [54]

normative A mandatory set of instructions or references. (C/PA) 1003.23-1998

normative annex An annex that is an official part of the standard but is placed after the clauses of the standard for convenience or to create a hierarchical distinction. (C/MM) 1754-1994

normative model A model that makes use of a familiar situation to represent a less familiar one; for example, a model that depicts the human cardiovascular system by using a mechanical pump, rubber hoses, and water. (C) 610.3-1989w

north (navigation aid terms) The primary reference direction relative to the earth. True north is the direction of the north geographical pole. Magnetic north is the direction north as determined by the earth's magnetic line of force. (AES/GCS) 172-1983w

North American digital hierarchy An ascending series of digital rates (1.544 Mb/s—DS1, 3.152 Mb/s—DS1C, 6.312 Mb/s—DS2, and 44.736 Mb/s—DS3) used for PCM transmission in North America. (COM/TA) 1007-1991r

north-stabilized plan-position indicator (radar) A special case of azimuth-stabilized PPI in which the reference direction is north. *See also:* navigation. (AES/RS) 686-1997, [42]

Norton's theorem States that a linear time-invariant one-port is equivalent to a circuit which consists of the driving-point admittance of the one-port shunted by the short-circuit current of the one-port. (CAS) [13]

Norton surface wave The propagating electromagnetic wave produced by a source over or on the ground. The Norton wave consists of the total field minus the geometrical-optics field. *See also:* ground wave; lateral wave. (AP/PROP) 211-1997

Norton transformation A four-terminal network transformation of a series (shunt) ladder element to an equivalent pi (tee) network in cascade with an ideal transformer. The pi (tee) network arms are identical to the series (shunt) arm except for multiplying factors related to the ideal transformer turns-ratio. (CAS) [13]

nose cone *See:* leader cone.

nose suspension A method of mounting an axle-hung motor or a generator to give three points of support, consisting of two axle bearings (or equivalent) and a lug or nose projecting from the opposite side of the motor frame, the latter supported by a truck or vehicle frame. *See also:* traction motor. (EEC/PE) [119]

NOT (mathematics of computing) A monadic Boolean operator having the property that if P is a statement, then the expression "NOT P" is true if P is false, and false if P is true. *Note:* NOT P is often represented by ~P, $\overline{P}$, or P′.

NOT Truth Table

P	$\overline{P}$
0	1
1	0

Synonyms: Boolean complementation; negation; inversion; complementary operator. (C) 1084-1986w

NOT-AND* *See:* NAND.

* Deprecated.

NOT AND gate *See:* NAND gate.

not a number (NaN) A symbolic entity encoded in floating-point format. There are two types of NaNs. Signaling NaNs signal the invalid (operation) exception whenever they appear as operands. Quiet NaNs propagate through almost every arithmetic operation without signaling exceptions. (C/MM/NI) 754-1985r, 1084-1986w, N13.4-1971w

notation (1) A system of symbols used to represent information, and the rules for their use. (C) 1084-1986w

(2) *See also:* positional notation.

(3) A set of symbols used to represent design entities and entity attributes. (C/SE) 1016.1-1993w

notation standard A standard that describes the characteristics of formal interfaces within a profession. (C) 610.12-1990

NOT-BOTH* *See:* NAND.

* Deprecated.

notch (1) A transient reduction in the magnitude (absolute value) of the quasi-sinusoidal mains voltage. (The duration is always less than a half-cycle and usually less than a few milliseconds.) *See also:* sag; undervoltage. (T&D/PE) 1250-1995

(2) A switching (or other) disturbance of the normal power voltage waveform, lasting less than a half cycle; which is initially of opposite polarity than the waveform, and is thus subtractive from the normal waveform in terms of the peak value of the disturbance voltage. This includes complete loss of voltage for up to a half cycle. *See also:* transient. (IA/PSE) 1100-1999

notch area The area of the line voltage notch. It is the product of the notch depth, in volts, times the width of the notch measured in microseconds. (IA/SPC) 519-1992

notch depth The average depth of the line voltage notch from the sine wave of voltage. (IA/SPC) 519-1992

notch filter A band-elimination filter, sometimes used to eliminate a single frequency for example, 60 Hz. (CAS) [13]

notching (relays) A qualifying term applied to a relay indicating that a predetermined number of separate impulses is required to complete operation. *See also:* relay. (PE/EEC) [119]

notching or jogging device (power system device function numbers) A device that functions to allow only a specified number of operations of a given device, or equipment, or a specified number of successive operations within a given time of each other. It is also a device that functions to energize a circuit periodically or for fractions of specified time intervals, or that is used to permit intermittent acceleration or jogging of a machine at low speeds for mechanical positioning. (PE/SUB) C37.2-1979s

notching relay A programming relay in which the response is dependent upon successive impulses of the input quantity. (SWG/PE) C37.100-1992

not connected (NC) (semiconductor memory) The inputs/outputs that are not connected to any active part of the circuit or any other pin or any conductive surface of the package. (TT/C) 662-1980s

note (1) A conventional sign used to indicate the pitch, or the duration, or both, of a tone. It is also the tone sensation itself or the oscillation causing the sensation. *Note:* The word serves when no distinction is desired among the symbol, the sensation, and the physical stimulus. (SP) [32]

(2) Helpful hint(s) and other material that may assist the user. (C/SE) 1063-1987r

(3) A body of free text that describes some general comment or specific constraint about a portion of a model. A note may be used in an early, high-level view prior to capturing constraints in the specification language; a note may further clarify a rule by providing explanations and examples. A note may also be used for "general interest" comments not involving rules. These notes may accompany the model graphics. (C/SE) 1320.2-1998

notebook computer A portable computer that is approximately the size of a standard 3-ring notebook binder; about 10 in × 11 in × 2 in. (C) 610.10-1994w

NOT element *See:* NOT gate.

no-test trunk (1) A specialized switch facility used for operator and service personnel metallic testing of lines. (AMR) 1390-1995

(2) A specialized switch facility used by the operator and service personnel for metallic testing of a subscriber's telephone lines (also known as a test trunk facility). (SCC31) 1390.3-1999, 1390.2-1999

NOT gate A combinational circuit that performs the Boolean operation of negation. *Synonym:* NOT element. (C) 610.10-1994w

notice of revision A form used in configuration management to propose revisions to a drawing or list, and, after approval, to notify users that the drawing or list has been, or will be, revised accordingly. *Synonym:* NOR. *See also:* specification change notice; configuration control; engineering change. (C) 610.12-1990

NOT-IF-THEN *See:* exclusion.

NOT-IF-THEN element *See:* NOT-IF-THEN gate.

NOT-IF-THEN gate A gate that performs the Boolean operation of exclusion. *Synonym:* NOT-IF-THEN element. (C) 610.10-1994w

NOT-OR* *See:* NOR.

* Deprecated.

NOT OR gate *See:* NOR gate.

not present When describing an argument to a function call, the case where a null pointer is supplied by the caller (as opposed to a pointer to an actual object of the type specified in the declaration). (C/PA) 1238.1-1994w

noughts complement *See:* radix complement.

novenary (A) (mathematics of computing) Pertaining to a selection in which there are nine possible out-comes. **(B) (mathematics of computing)** Pertaining to the numeration system with a radix of 9. (C) 1084-1986

novendenary (A) (mathematics of computing) Pertaining to a selection in which there are 19 possible outcomes. **(B) (mathematics of computing)** Pertaining to the numeration system with a radix of 19. (C) 1084-1986

NPA *See:* Next Page Algorithm; numbering-plan area code; numbering-plan area.

nPC *See:* next program counter.

n-plus-one address instruction format An n-address instruction format that also specifies the next instruction to be executed. *See also:* address format. (C) 610.10-1994w

***n*−plus-one address instruction** A computer instruction that contains $n + 1$ address fields, the last containing the address of the instruction to be executed next. *Contrast:* n−address instruction. *See also:* two-plus-one address instruction; one-plus-one address instruction. (C) 610.12-1990

NPR *See:* noise-power ratio.

NRA *See:* laser gyro axes.

NRC bulletins Publications titled NRC Information Notice and published by the Office of Nuclear Reactor Regulation (NRR) of the Nuclear Regulatory Commission (NRC). (PE/NP) 933-1999

NRM *See:* normal response mode.

nroff A text-formatting language. (C) 610.13-1993w

NRZ (non-return-to-zero recording) *See:* nonreturn to zero.

NRZ(C) *See:* nonreturn-to-zero (change) recording.

NRZI *See:* Non-Return-to-Zero, Invert on Ones.

NRZI-bit A code-bit transferred in NRZI format. The unit of data passed across the PMD service interface in 100BASE-X. (LM/C) 802.3u-1995s

NSA *See:* normalized site attenuation.

NSAP *See:* network service access point.

N-scope A cathode-ray oscilloscope arranged to present an N-display. (AES/RS) 686-1990

NSLR A country's National Standardizing Laboratory for radioactivity measurements. (NI) N42.14-1991

NSR *See:* non-source routed.

NTA *See:* next transfer address.

***n*–terminal electron tubes** *See:* input capacitance.

***N*–terminal network** A network with *N* accessible terminals. *See also:* network analysis. (Std100) 270-1966w

***N*–terminal pair network** A network with 2*N* accessible terminals grouped in pairs. *Note:* In such a network one terminal of each pair may coincide with a network node. *See also:* network analysis. (Std100) 270-1966w

N th field lag (th field lag) The fraction of the output signal which is read out in the *N* th field after the initial reading scan of an input signal which has been completely extinguished just before the scanning beam reaches that portion of the target irradiated by the input signal. This can be readily understood with reference to the decay characteristics diagram below. A similar definition can be made for the buildup of a signal as illustrated in the buildup characteristics diagram below. (ED) 503-1978w

***N* th harmonic** The harmonic of frequency *N* times that of the fundamental component. (Std100) 154-1953w

NTI *See:* noise transmission impairment.

NTSC *See:* National Television Standards Committee.

***n*–tuple (A)** An ordered set of values (x_1, x_2, . . ., x_n). **(B)** In a relational data model, a tuple. (C) 610.5-1990, 1084-1986

n-tuple length register A set of n registers that function as a single register. *Synonym:* n-tuple register. (C) 610.10-1994w

n-tuple register *See:* n-tuple length register.

N^2 diagram A system engineering or software tool for tabulating, defining, analyzing, and describing functional interfaces and interactions among system components. The N^2 diagram is a matrix structure that graphically displays the bidirectional interrelationships between functions and components in a given system or structure. (C/SE) 1362-1998

N-type A constant impedance connector compatible with certain coaxial cables. (C) 610.7-1995

***n*-type crystal rectifier** A crystal rectifier in which forward current flows when the semiconductor is negative with respect to the metal. *See also:* rectifier. (EEC/PE) [119]

***n*–type semiconductor** *See:* semiconductor, *n*-type.

NuBus® Refers to IEEE Std 1196-1987, IEEE Standard for a Simple 32-Bit Backplane Bus: Nubus. (C/MM) 1596-1992

nuclear burnup (A) (power operations) A measure of nuclear reactor fuel consumption, usually expressed as energy produced per unit weight of fuel exposed (megawatt-days per metric ton of fuel). **(B) (power operations)** Percentage of fuel atoms that have undergone fission (atom percent burnup). (PE/PSE) 858-1987, 346-1973

nuclear energy (power operations) The energy with which nucleons are bound together to form nuclei. When a nucleus is changed or rearranged in a nuclear reaction (fission, fusion, etc.) or by radioactive decay, nuclear energy may be released or absorbed in the form of kinetic energy of the reactants or products. *See also:* nuclear reactor; nuclear fuel elements; nuclear fuel reprocessing. (T&D/PE/PSE) 858-1987s, 346-1973w

nuclear fuel elements (power operations) (nuclear power generating station) An assembly of rods, tubes, plates, or other geometrical forms into which nuclear fuel is contained for use in a reactor. (PE/PSE) 858-1987s, 346-1973w

nuclear fuel reprocessing (power operations) (nuclear power generating station) The processing of irradiated reactor fuel to recover the unused fissionable material, or fission products, or both. (PE/PSE) 858-1987s, 346-1973w

nuclear plant reliability data system (NPRDS) A reliability database maintained by the Institute of Nuclear Power Operations (INPO) that receives failures reports from utilities within the United States. (PE/NP) 933-1999

nuclear power generating stations, class ratings (1) (class 1 structures and equipment) Structures and equipment that are essential to the safe shutdown and isolation of the reactor or whose failure or damage could result in significant release of radioactive material.
(2) (Class 1E) The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling, and containment and reactor heat removal, or are otherwise essential in preventing significant release of radioactive material to the environment.
(3) (Class 1E control switchboard) A rack panel, switchboard, or similar type structure fitted with any Class 1E equipment.
(4) (Class 1E electric systems) The systems that provide the electric power used to shut down the reactor and limit the release of radioactive material following a design basis event.
(5) (class II structures and equipment) Structures and equipment that are important to reactor operation but are not essential to the safe shutdown and isolation of the reactor and whose failure cannot result in a significant release of radioactive material.
(6) (class III structures and equipment) Structures and equipment that are not essential to the operation, safe shutdown, or isolation of the reactor and whose failure cannot result in the release of radioactive material.
(PE/NP) 380-1975w, 323-1974s, 344-1975s, 336-1980s, 420-1982, 383-1974r, 382-1980s, 308-1980s

nuclear power generating station (station) A plant wherein electric energy is produced from nuclear energy by means of suitable apparatus. The station may consist of one or more generating units. (PE/NP) 308-1991

nuclear reactor (power operations) An apparatus by means of which a fission chain reaction can be initiated, maintained, and controlled. (PE/PSE) 858-1987s

nuclear safety related (nuclear power generating station) That term used to call attention to safety classifications incorporated in the body of the document so marked. *Note:* As used in IEEE Std 494-1974, the term calls attention to the safety classification Class 1E. (PE/NP) 494-1974w

nucleus That part of a control program that is resident in main storage. *Synonym:* resident control program. (C) 610.10-1994w

nugget A data structure used in the procedural interface (PI) for rapid switching between technologies. (C/DA) 1481-1999

nuisance alarm An alarm warning that does not represent danger, safeguards threat, or equipment failure conditions requiring an actual response. (PE/NP) 692-1997

nuisance failure Intermittent or sustained failure of equipment secondary to system safety or reliability. (PE/NP) 933-1999

NUL The null character ('\0'). (PE/SUB) 1379-1997

NULL A byte with all bits set to zero. (C/MM) 1284.1-1997

null (1) (direction finding systems) (navigation aid terms) The condition of minimum output as a function of the direction of arrival of the signal, or of the rotation of the response pattern of the DF (direction finder) antenna system. (AES/GCS) 172-1983w
(2) (microprocessor operating systems parameter types) A value whose definition is to be supplied within the context of a specific operating system. This value is a representation of the set of no numbers or no value for the operating system in use. (C/MM) 855-1985s
(3) (signal-transmission system) The condition of zero error-signal achieved by equality at a summing junction between an input signal and an automatically or manually adjusted balancing signal of phase or polarity opposite to the input signal. *See also:* signal. (IE) [43]
(4) The direction between radiation lobes where the signal drops to a minimum. In general, a null is any portion of the pattern where the signal level is less than 10% of the rms of the pattern. (T&D/PE) 1260-1996
(5) *See also:* null. (AES/GYAC) 528-1994

null address (local area networks) An all zero address that does not identify any network end node. The null address may

be used as the destination address in training packets being sent from an end node or lower-level repeater to an upper-level repeater. The null address may be used in the Source Address (SA) field of training frames to verify link operation between an end node and the connected repeater. The null address may also be used in void frames. Packets with the null address are forwarded by the receiving repeater to all promiscuous ports. (C) 8802-12-1998

nullator An idealized one-port that is simultaneously an open and short circuit, that is, V-I-O. The nullator is a bilateral, loss-less one-port. (CAS) [13]

null balance (automatic null-balancing electric instrument) (instruments) The condition that exists in the circuits of an instrument when the difference between an opposing electrical quantity within the instrument and the measured signal does not exceed the dead band. *Note:* The value of the opposing electrical quantity produced within the instrument is related to the position of the end device. *See also:* measurement system; feedback control system. (EEC/EMI) [112]

null-balance system A system in which the input is measured by producing a null with a calibrated balancing voltage or current. *See also:* signal. (IE) [43]

null character (1) (data management) A control character that is used to accomplish media-fill or time-fill, and that may be inserted into or removed from, a sequence of characters without affecting the meaning of the sequence; however, the control of equipment or the format may be affected by this character. *See also:* space character. (C) 610.5-1990w

(2) The value `POSIX_Character'Value(0)`, if defined. The use of a null character in filenames or environment variable names or values produces undefined results. Implementations shall not return null characters to applications in filenames or environment variable names or values. (C) 1003.5-1999

null cycle A type of an attention cycle that is used to dismiss a resource lock and initiate a rearbitration. (C/MM) 1196-1987w

null data (data management) Data for which space is allocated but for which no value currently exists. (C) 610.5-1990w

null DATA packet *See:* NULL packet.

nullity (degrees of freedom on mesh basis) (networking) The number of independent meshes that can be selected in a network. The nullity N is equal to the number of branches B minus the number of nodes V plus the number of separate parts P. $N = B - V + P$. *See also:* network analysis. (Std100) 270-1966w

null junction (power supplies) The point on the Kepco bridge at which the reference resistor, the voltage-control resistance, and one side of the comparison amplifier coincide. *Note:* The null junction is maintained at almost zero potential and is a virtual ground. *See also:* summing point. (AES/PE) [41], [78]

null offsetting (accelerometer) (inertial sensors) (gyros) A calibration or test technique by which the electrical null position is intentionally shifted, resulting in a rotation of the input axis relative to the input reference axis. (AES/GYAC) 528-1994

null operation (FASTBUS acquisition and control) A primary address cycle followed by no data cycles. It determines if the system contains a device capable of responding to the primary address used. It can be used to reserve segment interconnects for an arbitration locked sequence. (NID) 960-1993

NULL packet (1) A special type of DATA packet containing a data field entirely filled with logic zeros and a parity bit equal to logic one. *Synonym:* null DATA packet. (TT/C) 1149.5-1995

(2) A packet in which no clocked data is transmitted on Serial Bus between DATA_PREFIX and DATA_END. (C/MM) 1394a-2000

null pointer (data management) A pointer that is empty; that is, a pointer that does not point to anything. (C) 610.5-1990w

null-reference glide slope (navigation aid terms) A glide-slope system using a two-element array in which the slope angle is defined by the first null above the horizontal in the field pattern of the upper antenna. (AES/GCS) 172-1983w

null steering To control, usually electronically, the direction at which a directional null appears in the radiation pattern of an operational antenna. (AP/ANT) 145-1993

null-steering antenna system An antenna having in its radiation pattern one or more directional nulls that can be steered, usually electronically. (AP/ANT) 145-1993

null string (1) (data management) A string containing no entries. *Note:* It is said that a null string has length zero. (C) 610.5-1990w

(2) *See also:* empty string. (C/PA) 1003.5-1999, 9945-2-1993

null transaction A transaction that has no effect on the master file that is being updated. It is usually used for documentation purposes only. *See also:* delete transaction; add transaction; change transaction; update transaction. (C) 610.2-1987

null tree (data management) A tree that has exactly one root and one descendant node. (C) 610.5-1990w

null triggering/zero-crossing triggering (thyristor) A method of triggering the controller circuit elements such that the associated angle of retard is zero. (IA/IPC) 428-1981w

number (A) (electronic computation) Formally, an abstract mathematical entity that is a generalization of a concept used to indicate quantity, direction, etc. In this sense a number is independent of the manner of its representation. **(B) (electronic computation)** Commonly: A representation of a number as defined above (for example, the binary number 10110, the decimal number 3695, or a sequence of pulses). **(C) (electronic computation)** An expression, composed wholly or partly of digits, that does not necessarily represent the abstract entity mentioned in the first meaning. *Note:* Whenever there is a possibility of confusion between meaning (A) and meaning (B) or (C), it is usually possible to make an unambiguous statement by using "number" for meaning (A) and "numerical expression" for meaning (B) or (C). *Synonym:* numerical expression. (C) 162-1963

(2) (A) (mathematics of computing) A mathematical abstraction indicating a quantity or amount. **(B) (mathematics of computing)** Loosely, a numeral. (C) 1084-1986

number-crunching Computer processing that relies heavily on the arithmetic and logical capabilities of the central processing unit, as contrasted with processing that entails extensive input/output or data movement. (C) 610.2-1987

number group (telephone switching systems) An arrangement for associating equipment numbers with mainstation codes. (COM) 312-1977w

numbering plan (telephone switching systems) A plan employing codes and directory numbers for identifying main stations and other terminations within a telecommunication system. (COM) 312-1977w

numbering-plan area (NPA) (telephone switching systems) A geographical subdivision of the territory covered by a national or integrated numbering plan. An NPA is identified by a distinctive area code (NPA code). (COM) 312-1977w

numbering-plan area code (NPA) (telephone switching systems) A one–, two–, or three-digit number that, for the purpose of distance dialing, designates one of the geographical areas within a country (and in some instances neighboring territories) that is covered by a separate numbering plan. (COM) 312-1977w

number of channels A six-character number (no decimal point) giving the number of channels included in this file. The last record contains blank data for the data in excess of the actual number of channels. Leading spaces are interpreted as zeros. (NPS/NID) 1214-1992r

number of inherent tap positions The highest number of tap positions for half a cycle of operation for which an LTC is designed. (PE/TR) C57.131-1995

number of loops (magnetically focused electron beam) The number of maxima in the beam diameter between the electron gun and the target, or between a point on the photocathode and the target. (ED) 161-1971w

number of rectifier phases (rectifier circuits) The total number of successive, nonsimultaneous commutations occuring within that rectifier circuit during each cycle when operating without phase control. *Note:* It is also equal to the order of the principal harmonic in the direct-current potential wave shape. The number of rectifier phases influences both alternating-current and direct-current waveforms. In a simple single-way rectifier the number of rectifier phases is equal to the number of rectifying elements. *See also:* rectifier circuit element; rectification. (IA) 59-1962w, [12]

number of scanning lines (numerically) (television) The total number of lines, both active and blanked, in a frame. *Note:* In any specified scanning system, this number is inherently the ratio of the line frequency to the frame frequency and is always a whole number. In a two-to-one odd-line interlaced system, it is always an odd whole number. (BT/AV) 201-1979w

number of service tap positions The number of tap positions for half a cycle of operation for which an LTC is used in a transformer. *Note:* The above two terms, 3.19 and 3.20, are generally given as the ± values of the relevant numbers, e.g., ± 16 positions. They are, in principle, valid also for the motor-drive mechanism. When the term *number of tap positions* is used in connection with a transformer, this always refers to the number of service tap positions of the LTC. (PE/TR) C57.131-1995

number 1 master *See:* original master.

number 1 mold (mother) (metal positive) A mold derived by electroforming from the original master. *See also:* phonograph pickup. (SP) [32]

number range (mathematics of computing) The set of values that a number may assume. (C) 1084-1986w

number representation (mathematics of computing) A representation of a number in a numeration system. *Synonym:* numeration. (C) 1084-1986w

number representation system (mathematics of computing) A system for the representation of numbers; for example, the decimal numeration system, the Roman numeral system, the binary numeration system. *Synonyms:* numeration system; numeral system. (C) 1084-1986w

number sign The character "#". (C/PA) 9945-2-1993

number system (electronic computation) Loosely, a numeration system. *See also:* positional notation. (C) [20], 1084-1986w, [85]

number 2, number 3, etc. master A master produced by electroforming from a number 1, number 2, etc. mold. *See also:* phonograph pickup. (SP) [32]

number 2, number 3, etc. mold A mold derived by electroforming from a number 2, number 3, etc. master. *See also:* phonograph pickup. (SP) [32]

numeral (mathematics of computing) A representation of a number. *See also:* binary numeral; decimal numeral; hexadecimal numeral; octal numeral. (C) [20], [85], 1084-1986w

numeral system *See:* number representation system.

numeration *See:* number representation.

numeration system (1) (numeral system) A system for the representation of numbers, for example, the decimal system, the Roman numeral system, the binary system. (C) [20], [85]

(2) (mathematics of computing) *See also:* number representation system. (C) 1084-1986w

numeric (data management) (mathematics of computing) Pertaining to data that can be expressed using only numbers and mathematical symbols, in contrast to characters or other special signs or symbols. *Synonym:* numerical. *See also:* pure numeric; arithmetic; numeric data. (C) 610.5-1990w, 1084-1986w

numerical *See:* numeric.

numerical action (switch) That action that depends on at least part of the called number. (EEC/PE) [119]

numerical analysis (mathematics of computing) The study of methods of obtaining useful quantitative solutions to problems that have been expressed mathematically, including the study of the errors and bounds on errors in obtaining such solutions. (C) [20], [85], 1084-1986w

numerical aperture (NA) (A) (fiber optics) The sine of the vertex angle of the largest cone of meridional rays that can enter or leave an optical system or element, multiplied by the refractive index of the medium in which the vertex of the cone is located. Generally measured with respect to an object or image point and will vary as that point is moved. **(B) (fiber optics)** For an optical fiber in which the refractive index decreases monotonically from n sub 1 on axis to n sub 2 in the cladding, the numerical aperture is given by

$$NA = \sqrt{n_1^2 - n_2^1}$$

(C) (fiber optics) Colloquially, the sine of the radiation or acceptance angle of an optical fiber, multiplied by the refractive index of the material in contact with the exit or entrance face. This usage is approximate and imprecise, but is often encountered. *See also:* meridional ray; radiation angle; launch numerical aperture; radiation pattern; acceptance angle. (Std100) 812-1984

numerical control (NC) (1) Pertaining to the automatic control of processes by the proper interpretation of numerical data. (C) [20], [85]

(2) Computer control of machines that produce manufactured parts. *See also:* distributed numerical control; direct numerical control; process control; computer numerical control. (C) 610.2-1987

numerical control machine (1) A machine that produces manufactured parts under automatic control. (C) 610.2-1987

(2) A machine that produces drilled, milled, and machined parts under automatic control. *Synonym:* numerical control tool. (C) 610.10-1994w

numerical control system (numerically controlled machines) A system in which actions are controlled by the direct insertion of numerical data at some point. *Note:* The system must automatically interpret at least some portion of these data. (IA/EEC) [61], [74]

numerical control tool *See:* numerical control machine.

numerical data Data in which information is expressed by a set of numbers or symbols that can only assume discrete values or configurations. (IA) [61]

numerical display (illuminating engineering) An electrically operated display of digits. Tungsten filaments, gas discharges, light-emitting diodes, liquid crystals, projected numerals, illuminated numbers and other principles of operation may be used. (EEC/IE) [126]

numerical expression *See:* number.

numerical model (A) A mathematical model in which a set of mathematical operations are reduced to a form suitable for solution by a simpler methods such as numerical analysis or automation; for example, a model in which a single equation representing a nation's economy is replaced by a large set of simple averages based on empirical observations of inflation rate, unemployment rate, gross national product, and other indicators. **(B)** A model whose properties are expressed by numbers. (C) 610.3-1989

numerical reliability (software) The probability that an item will perform a required function under stated conditions for a stated period of time. *See also:* function. (C/SE) 729-1983s

numerical shift *See:* arithmetic shift.

numeric attribute An attribute whose value may be either integer or real. (LM/C) 802.1F-1993r

numeric bit data *See:* binary picture data.

numeric character *See:* digit.

numeric character data *See:* decimal picture data.

numeric character set (data management) A character set that contains digits and may contain control characters, special characters, and the space character, but not letters. (C) 610.5-1990w

numeric code A code that uses numerals to represent data. (C) 610.5-1990w, 1084-1986w

numeric data (data management) Data used to represent numbers. *See also:* binary data; complex data; packed data; real data; integer data. (C) 610.5-1990w

numeric keypad A keypad comprising of the numeric keys and usually the dot, comma and return keys. *Note:* It is most often located near the full keyboard, the keys being arranged in a 3×4 or 4×4 array to facilitate numeric data entry. (C) 610.10-1994w

numeric keypunch A keypunch that processes only numeric data. (C) 610.10-1994w

numeric optical disk *See:* optical disk.

numeric printout (dedicated-type sequential events recording systems) A brief coded method of identifying inputs using numeric characters only. (PE/EDPG) [5], [1]

numeric punch A hole punched in one of the punch rows designated as zero through nine. *See also:* digit punch. (C) 610.10-1994w

numeric representation (data management) A discrete representation of data by numerals. (C) 610.5-1990w

numeric shift (data management) A control for selecting the numeric character set on an alphanumeric keyboard or printer. *Contrast:* alphabetic shift. *See also:* shift character. (C) 610.5-1990w

N-unit (N) A measurement of refractivity, usually in parts per million, where:

$N = (n - 1) \times 10^6$

where

n = the refractive index

See also: refractivity. (AP/PROP) 211-1997

nurses' stations (health care facilities) Areas intended to provide a center of nursing activity for a group of nurses working under one nurse supervisor and serving bed patients, where the patient's calls are received, nurses are dispatched, nurses' notes written, inpatient charts prepared, and medications prepared for distribution to patients. Where such activities are carried on in more than one location within a nursing unit, all such separate areas are considered a part of the nurses' station. (NESC/NEC) [86]

nursing home (health care facilities) A building or part thereof used for the lodging, boarding and nursing care, on a 24-hour basis, of 4 or more persons who, because of mental or physical incapacity, may be unable to provide for their own needs and safety without the assistance of another person. Nursing home, wherever used in the National Electrical Code shall include nursing and convalescent homes, skilled nursing facilities, intermediate care facilities, and infirmaries of homes for the aged. (NESC/NEC) [86]

N-user An N+1 entity that uses the services of the N-layer, and below, to communicate with another N+1 entity. (C/LM/CC) 8802-2-1998

nutating feed A technique of conical scanning in which the polarization remains unchanged. (AES) 686-1997

nutation (gyros) The oscillation of the spin axis of a gyro about two orthogonal axes normal to the mean position of the spin axis. (AES/GYAC) 528-1994

nutation frequency (inertial sensors) (gyros) The frequency of the coning or periodic wobbling motion of the rotor spin axis that results from a transient input. For an undamped rotor, the nutation frequency equals the product of the rotor spin frequency and the ratio of the rotor polar moment of inertia to the effective rotor transverse moment of inertia. (AES/GYAC) 528-1994

NVM *See:* nonvolatile memory.

nybble *See:* quartet; nibble.

Nyquist diagram (data transmission) The Nyquist diagram of a feedback amplifier is a plot, in rectangular coordinates, of the real and imaginary parts of the factor $\propto/\beta$ for frequencies from zero to infinity, where $\propto$ is the amplification in the absence of feedback, and β is the fraction of the output voltage that is superimposed on the amplifier input. *Note:* The criterion for stability of a feedback amplifier is that the curve of the Nyquist diagram shall not enclose the point $X = -1$, $Y = 0$, where μ/β equals $X + jY$. (PE) 599-1985w

Nyquist interval (data transmission) The maximum separation in time that can be given to regularly spaced instantaneous samples of a wave of bandwidth W for complete determination of the wave form of the signal. Numerically, it is equal to $1/2W$ seconds. (PE) 599-1985w

Nyquist rate (1) (channel) The reciprocal of the Nyquist interval. (IT) [123]

(2) The minimum rate that an analog signal must be sampled in order to be represented in digital form. This rate is twice the frequency of that signal. (PE/PSR) 1344-1995