EXHIBIT 12

IEEE 100
The Authoritative Dictionary of IEEE Standards Terms

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dence on frequency over the greater part of the audible frequency range. (PE/TR) C57.12.90-1999

cybernetics (1) A branch of technology concerned with the comparative study of communication and control in living organisms and in machines. (C) 610.2-1987
(2) *See also:* system science.

cycle (1) (A) An interval of space or time in which one set of events or phenomena is completed. **(B)** Any set of operations that is repeated regularly in the same sequence. The operations may be subject to variations on each repetition. (C) [20], [85]
(2) (pulse terminology) The complete range of states or magnitudes through which a periodic waveform or a periodic feature passes before repeating itself identically. (IM/WM&A) 194-1977w
(3) (A) (data transmission) An interval of space or time in which one set of events or phenomena is completed; any set of operations that is related regularly in the same sequence. The operations may be subject to variations on each each repetition. **(B) (data transmission)** The complete set of values of a periodic quantity that occurs during a period. *Note:* It is one complete set of positive and negative values of an alternating current. (PE) 599-1985
(4) (test pattern language) A complete operation, such as writing or reading, performed by a memory. *Synonym:* period. (TT/C) 660-1986w
(5) (A) (software) A period of time during which a set of events is completed. *See also:* software life cycle; software development cycle. **(B) (software)** A set of operations that is repeated regularly in the same sequence, possibly with variations in each repetition; for example, a computer's read cycle. *See also:* pass. (C) 610.12-1990
(6) (NuBus) One period of the bus clock, from rising edge to the next rising edge. (C/MM) 1196-1987w
(7) A battery discharge followed by a complete recharge. A deep (or full) cycle is described as the removal and replacement of 80% or more of the cell's design capacity. (PE/EDPG) 1184-1994
(8) (A) In an ac voltage or current, exactly one complete set of positive and negative values. **(B)** Any set of operations that is repeated regularly in the same sequence. *See also:* machine cycle; instruction cycle; cycle time; read cycle; write cycle. **(C)** To perform, or cause to perform, one set of operations as in definition (B). **(D)** An interval of space or time in which one set of operations as in definition (B) is completed. (C) 610.10-1994
(9) The complete series of values of a periodic quantity that occurs during a period. (It is one complete set of positive and negative values of an alternating current.). (IA/MT) 45-1998

®NuBus is a registered trademark of Texas Instruments, Inc.

cycle counter *See:* index register.

cycle life The number of cycles (discharges and recharges), under specified conditions, that a battery can undergo before failing to meet its specified end-of-life capacity. (PV) 1013-1990, 1144-1996

cycle master (1) The node that generates the periodic cycle start. (C/MM) 1394-1995
(2) The node that generates the periodic cycle start packet 8000 times a second. (C/MM) 1394a-2000

cycle of operation (1) The discharge and subsequent recharge of the cell or battery to restore the initial conditions. *See also:* charge. (EEC/PE) [119]
(2) The movement of the LTC from one end of its range to the other and back to its original position. (PE/TR) C57.131-1995

cycle start A primary packet sent by the cycle master that indicates the start of an isochronous cycle. (C/MM) 1394-1995

cycle start packet A primary packet sent by the cycle master that indicates the start of an isochronous period. (C/MM) 1394a-2000

cycle stealing The process of suspending the operation of a central processing unit for one or more cycles to permit the occurrence of other operations, such as transferring data from main storage in response to an output request from an input-output controller. (C) 610.10-1994w, 610.12-1990

cycle termination The phase of a cycle during which the master terminates the cycle, and slaves acknowledge this termination by establishing the intercycle state of bus signals. (C/MM) 1096-1988w

cycle time The minimum amount of time between the start of successive read or write cycles of a storage device. *See also:* write cycle time; read cycle time. (C) 610.10-1994w

cyclically magnetized condition A condition of a magnetic material when, under the influence of a magnetizing force that is a cyclic (but not necessarily periodic) function of time having one maximum and one minimum per cycle, it follows identical hysteresis loops on successive cycles. (Std100) 270-1966w

cyclic binary code *See:* Gray code.

cyclic code *See:* Gray code.

cyclic code error detection (power-system communication) The process of cyclically computing bits to be added at the end of a word such that an identical computation will reveal a large portion of errors that may have been introduced in transmission. *See also:* digital. (PE) 599-1985w

cyclic decimal code A binary code in which sequential decimal digits are represented by four-bit BCD expressions, each of which differs from the preceding expression in one place only. *Note:* This is an example of unit-distance code. (C) 1084-1986w

cyclic duration factor (rotating machinery) The ratio between the period of loading including starting and electric braking, and the duration of the duty cycle, expressed as a percentage. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

cyclic function A function that repetitively assumes a given sequence of values at an arbitrarily varying rate. *Note:* That is, if y is a periodic function of x and x in turn is a monotonic nondecreasing function of t, then y is said to be a cyclic function of t. (Std100) 270-1966w

cyclic irregularity (rotating machinery) The periodic fluctuation of speed caused by irregularity of the prime-mover torque. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

cyclic permuted code *See:* unit-distance code.

cyclic redundancy (check) code Defined for some digital transmission formats (usually stated with the number of bits in the code; e.g., CRC6, CRC9, etc.). The CRC is the result of a calculation carried out on the set of transmitted bits by the transmitter. The CRC is encoded into the transmitted signal with the data. At the receiver, the calculation creating the CRC may be repeated, and the result compared to that encoded in the signal. The calculations are chosen to optimize the error detection capability. (COM/TA) 1007-1991r

cyclic redundancy check (CRC) (1) A form of error check used to ensure the accuracy of transmitting a message. *Note:* The CRC is the result of a calculation carried out on the set of transmitted bits by the transmitter. The CRC is encoded into the transmitted signal with the data. At the receiver, the calculation creating the CRC may be repeated, and the result compared to that encoded in the signal. The calculations are chosen to optimize the error detection capability. *Contrast:* parity check; parity. *See also:* frame check sequence; frame check sequence error. (C) 610.7-1995
(2) An error-detection scheme that checks the integrity of a transmitted message for errors introduced during transmission. (PE/SUB) 1379-1997
(3) The result of a calculation carried out on the octets within an IrLAP frame; also called a frame check sequence. The CRC is appended to the transmitted frame. At the receiver, the calculation creating the CRC may be repeated, and the

constructs and, sometimes
velop, analyze, and docu-
iter architecture. *See also:*
    (C) 610.10-1994w
characteristics of a system
in tolerances.
    (VT/RT) 1483-2000
ardware that is designated
ng, interfacing, configura-
s.
  (C/SE) J-STD-016-1995
escription language; hard-
iguage.
  measures or records spec-
computer system; for ex-
currences of various elec-
between such events. *See*
3) A software tool that re-
during the execution of a
tor; software monitor.
    (C) 610.12-1990
diagnostic equipment)
ical elements, such as re-
its containing only wire
intervening switching in-
     (MIL) [2]
data acquisition, and au-
nd data acquisition) The
within a device by way
ween components within
e not alterable except by
ween components.
7.1-1987s, C37.100-1992
Vired interconnections of
(PE/EDPG) 1020-1988r
whose characteristics are
iterconnections between
le.   (C) 610.10-1994w
rcuits permanently inter-
ction.
    (C) 610.10-1994w
idiation, or induction that
isly degrades, obstructs,
iunication service or any
in accordance with reg-
compatibility.
    (EMC) [53]
of oil that violates appli-
a film or sheen upon or
ater or adjoining shore-
to be deposited beneath
ining shorelines.
  (SUB/PE) 980-1994
ictive compensation of
r characteristics) (self-
dal component of a pe-
uency that is an integral
y. *Note:* For example, a
s twice the fundamental
nic. *See also:* nonchar-
iarmonic; relative har-
s; harmonic content.
6-1987w, C62.48-1995,
, 519-1992, 1250-1995
e for measuring the am-
nonic components of a
e also: wave analyzer;
   (EEC/PE) [119]
ristic harmonic.
racteristics) (self-com-
s of the harmonic con-
er and rms (root-mean-

square) values of the Fourier series terms describing the periodic function.   (IA/SPC) 936-1987w

harmonic conjugate *See:* Hilbert transform.

harmonic content (1) (converter characteristics) (self-commutated converters) The function obtained by subtracting the dc (direct current) and fundamental components from a nonsinusoidal periodic function.   (IA/SPC) 936-1987w
(2) (nonsinusoidal periodic wave) The deviation from the sinusoidal form, expressed in terms of the order and magnitude of the Fourier series terms describing the wave. *See also:* rectification; power rectifier.   (IA/SPC) [62]
(3) Distortion of a sinusoidal waveform characterized by indication of the magnitude and order of the Fourier series terms describing the wave. *Note:* For power lines, the harmonic content is small and of little concern for the purpose of field measurements, except at points near large industrial loads (saturated power transformers, rectifiers, aluminum and chlorine plants, etc.) where certain harmonics may reach 10% of the line voltage. Laboratory installations also may have voltage or current sources with significant harmonic content.
   (T&D/PE) 644-1994, 539-1990
(4) A measure of the presence of harmonics in a voltage or current wave form expressed as a percentage of the amplitude of the fundamental frequency at each harmonic frequency. The total harmonic content is expressed as the square root of the sum of the squares of each of the harmonic amplitudes (expressed as a percentage of the fundamental).
   (IA/PSE) 446-1995

harmonic conversion transducer (frequency multiplier, frequency divider) A conversion transducer in which the output-signal frequency is a multiple or submultiple of the input frequency. *Notes:* 1. In general, the output-signal amplitude is a nonlinear function of the input-signal amplitude. 2. Either a frequency multiplier or a frequency divider is a special case of harmonic conversion transducer. *See also:* transducer; heterodyne conversion transducer.   (ED) 161-1971w

harmonic distortion (1) (data transmission) Nonlinear distortion of a system or transducer characterized by the appearance in the output of harmonics other than the fundamental component when the input wave is sinusoidal. *Note:* Subharmonic distortion may also occur.   (PE) 599-1985w
(2) (broadband local area networks) A form of interference caused by the generation of signals according to the relationship N_f, where N is an integer greater than one and f is the original signal's frequency.   (LM/C) 802.7-1989r
(3) For a pure sine wave input, output components at frequencies that are an integer multiple of the applied sine wave frequency.   (IM/WM&A) 1057-1994w
(4) Nonlinear distortion that appears as harmonics of a single-frequency input.   (PE/IC) 1143-1994r
(5) The mathematical representation of the distortion of the pure sine waveform. *See also:* distortion factor.
   (IA/PSE) 1100-1999

harmonic factor The ratio of the root-sum-square (rss) value of all the harmonics to the root-mean-square (rms) value of the fundamental.

$$\text{harmonic factor (for voltage)} = \frac{\sqrt{E_3^2 + E_5^2 + E_7^2 \ldots}}{E_1}$$

$$\text{harmonic factor (for current)} = \frac{\sqrt{I_3^2 + I_5^2 + I_7^2 \ldots}}{I_1}$$

   (IA/SPC) 519-1992

harmonic leakage power (TR and pre-TR tubes) The total radio-frequency power transmitted through the fired tube in its mount at frequencies other than the fundamental frequencies generated by the transmitter.   (ED) 161-1971w

harmonic, noncharacteristic *See:* noncharacteristic harmonic.

harmonic-restraint relay A restraint relay so constructed that its operation is restrained by harmonic components of one or more separate input quantities.   (SWG/PE) C37.100-1992

harmonics *See:* harmonic components.

harmonic series A series in which each component has a frequency that is an integral multiple of a fundamental frequency.   (SP) [32]

harmonic telephone ringer A telephone ringer that responds only to alternating current within a very narrow frequency band. *Note:* A number of such ringers, each responding to a different frequency, are used in one type of selective ringing. *See also:* telephone station.   (EEC/PE) [119]

harmonic test (rotating machinery) A test to determine directly the value of one or more harmonics of the waveform of a quantity associated with a machine, relative to the fundamental of that quantity. *See also:* asynchronous machine.
   (PE) [9]

harmonization The process of ensuring that profiles do not overlap or conflict.   (C/PA) 14252-1996

harness A component with a design of straps that is fastened about the worker in a manner so as to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest, and shoulders with means for attaching it to other components and subsystems.
   (NESC/T&D/PE) C2-1997, 1307-1996

harsh environment (nuclear power generating station) An environment expected as a result of the postulated service conditions appropriate for the design basis and post-design basis accidents of the station. (A design basis accident is that subset of a design basis event which requires safety function performance). Harsh environments are the result of a loss of cooling accident (LOCA)/high energy line break (HELB) inside containment and post-LOCA or HELB outside containment.   (PE/NP) 323-1974s

hartley A unit of information content, equal to one decadal decision, or the designation of one of ten possible and equally likely values or states of anything used to store or convey information. *Notes:* 1. A hartley may be conveyed by one decadal code element. One hartley equals (log of 10 to base 2) times one bits. 2. If, in the definition of information content, the logarithm is taken to the base ten, the result will be expressed in hartleys. *Synonym:* dit. *See also:* bit.
   (IT/PE) [123], 599-1985w

Hartley oscillator An electron tube or solid state circuit in which the parallel-tuned tank circuit is connected between grid and plate, the inductive element of the tank having an intermediate tap at cathode potential, and the necessary feedback voltage obtained across the grid-cathode portion of the inductor. *See also:* radio-frequency generator.
   (IA) 54-1955w

Harvard class architecture A computer architecture with separate paths to main storage for instructions and data, allowing for a high memory bandwidth. *Contrast:* Von Neumann architecture.   (C) 610.10-1994w

hash To calculate the hash value for a given item. *See also:* hashing.   (C) 610.5-1990w

hash address *See:* hash value.

hash addressing *See:* hashing.

hash clash *See:* collision.

hash coding *See:* hashing.

hash function In hashing, the function used to determine the position of a given item in a set of items. *Note:* The function operates on a selected field, called a key, in each item and the function is generally a many-to-one mapping. *Synonyms:* key transformation function; calc algorithm. *See also:* key folding function; division transformation function; algebraic coding function; key transformation; mid-square function; radix transformation function; multiplication transformation function; digit transformation function.   (C) 610.5-1990w

hash index *See:* hash value.

hashing A technique for arranging a set of items, in which a hash function is applied to the key of each item to determine its hash value. The hash value identifies each item's primary position in a hash table, and if this position is already occupied, the item is inserted either in an overflow table or in another available position in the table. *Synonyms:* scatter stor-

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