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frequency range (1) (general) A specifically designated part of the frequency spectrum.

(2) **(transmission system)** The frequency band in which the system is able to transmit power without attenuating or distorting it more than a specified amount.

(3) **(device)** The range of frequencies over which the device may be considered useful with various circuit and operating conditions. *Note:* Frequency range should be distinguished from bandwidth, which is a measure of useful range with fixed circuits and operating conditions. *See also:* signal wave. (ED) 161-1971w, 270-1966w, [45]

(4) **(acousto-optic deflector)** The frequency range, Δf , over which the diffraction efficiency is greater than some specified minimum. (UFFC) [17]

(5) **(spectrum analyzer)** That range of frequency over which the instrument performance is specified (hertz to hertz). (IM) [14], 748-1979w

frequency record (electroacoustics) A recording a various known frequencies at known amplitudes, usually for the purpose of testing or measuring. *See also:* phonograph pickup. (SP) [32]

frequency regulation (1) (emergency and standby power) The percentage change in emergency or standby power frequency from steady-state no load to steady-state full load.

$$\%R = \frac{F_{n1} - F_{f1}}{F_{f1}} \cdot 100$$

(IA/PSE) 446-1995

(2) **(ferroresonant voltage regulators)** The maximum amount that the output voltage or current will change as the result of a specified change in line frequency. *See also:* over-all regulation. (PE/LT) 449-1990s

frequency relay (1) (power system device function numbers) A relay that responds to the frequency of an electrical quantity, operating when the frequency or rate of change of frequency exceeds or is less than a predetermined value. (PE/SUB) C37.2-1979s

(2) A relay that responds to the frequency of an alternating electrical input quantity. (SWG/PE) C37.100-1992

frequency resolution The ability of a receiver or signal processing system to detect or measure separately two or more signals that differ only in frequency. *Note:* The classic measure of frequency resolution is the minimum frequency separation of two otherwise identical signals that permits the given system to distinguish that two frequencies are present and to extract the desired information from each of them. When the separation is done by means of a tunable bandpass filter system, the resolution is often specified as the width of the frequency-response lobe measured at a specific value (such as three decibels) below the peak response. *See also:* angular resolution. (AES) 686-1997

frequency response (1) (power supplies) The measure of an amplifier or power supply's ability to respond to a sinusoidal program. *Notes:* 1. The frequency response measures the maximum frequency for full-output voltage excursion. 2. Frequency response connotes amplitude-frequency response, which should be used in full, particularly if phase-frequency response is significant. This frequency is a function of the slewing rate and unity-gain bandwidth. *See also:* amplitude-frequency response. (AES/PE) [41], [78], 599-1985w

(2) **(spectrum analyzer)** The peak-to-peak variation of the displayed amplitude over a specified center frequency range, measured at the center frequency, (dB). *Note:* Frequency response is closely related to display flatness. The main difference is that the tuning control of the spectrum analyzer is readjusted so as to center the display. (IM) 748-1979w

(3) **(speed governing of hydraulic turbines)** A characteristic, expressed by formula or graph, which describes the dynamic and steady-state response of a physical system in terms of the magnitude ratio and the phase displacement between a sinusoidally varying input quantity and the fundamental of

the corresponding output quantity as a function of the fundamental frequency. (PE/EDPG) 125-1977s

(4) **(broadband local area networks)** The change of a parameter (usually signal amplitude) with frequency. (LM/C) 802.7-1989r

(5) Electrical, acoustic, or electroacoustic sensitivity as a function of frequency. (COM/TA) 269-1992, 1206-1994

(6) **(bandwidth)** The change in response (reading) of a field meter to a field of constant amplitude but different frequencies. *Note:* The range of frequencies over which the field meter response is constant to within 3 dB is often referred to as the bandwidth of the field meter. (T&D/PE) 1308-1994

(7) The ratio of the magnitude of the system output to the magnitude of the stimulus over a specified frequency range. (COM/TA) 1027-1996

(8) Electrical, acoustic, or electroacoustic sensitivity (output/input) or gain as a function of frequency. (COM/TA) 1329-1999

(9) *See also:* transfer function. (PAS) 812-1984w

(10) **(telecommunications)** *See also:* attenuation distortion. (COM/TA) 1007-1991r

frequency-response characteristic (1) (signal-transmission system, industrial control) The frequency-dependent relation, in both gain and phase difference, between steady-state sinusoidal outputs. *Notes:* 1. With nonlinearity, as evidenced by distortion of a sinusoidal input of specified amplitudes, the relation is based on that sinusoidal component of the output having the frequency of the input. 2. Mathematically, the frequency-response characteristic is the complex function of $S = j\omega$:

$$A_o(j\omega)/A_i(j\omega) \exp \{j[\theta_o(j\omega) - \theta_i(j\omega)]\}$$

See also: signal; feedback control system. (IE/PE/IA/EDPG/IAC/APP) [43], [3], [60], [69]

(2) **(linear system)** In a linear system, the frequency-dependent relation, in both gain and phase difference, between steady-state sinusoidal inputs and the resultant steady-state sinusoidal outputs. (PE/EDPG) 421.2-1990

(3) **(automatic generation control on electric power systems)** The sum of an area's generation-frequency and load-frequency characteristics. (PE/PSE) 858-1993w, 94-1991w

frequency-response equalization (1) The effect of all frequency discriminative means employed in a transmission system to obtain a desired over-all frequency response. (SP/ACO) [32]

(2) The process of modifying a frequency response of one network by introducing a frequency response of another network so that, within the band of interest, the combined response follows a specified characteristic. (CAS) [13]

frequency selective bandwidth The inverse of the product $2\pi\sigma_r$, where σ_r is the time delay spread. *Synonyms:* coherent bandwidth; dispersive bandwidth. (AP/PROP) 211-1997

frequency selective fading Fading which affects unequally the different spectral components of a radio signal. (AP/PROP) 211-1997

frequency-selective ringing (telephone switching systems) Selective ringing that employs currents of several frequencies to activate ringers, each of which is tuned mechanically or electrically, or both, to one of the frequencies so that only the desired ringer responds. (COM) 312-1977w

frequency-selective voltmeter A selective radio receiver, with provisions for output indication. (EMC) [53], 263-1965w

frequency selectivity (1) (A) (selectivity) A characteristic of an electric circuit or apparatus in virtue of which electric currents or voltages of different frequencies are transmitted with different attenuation. (B) **(selectivity)** The degree to which a transducer is capable of differentiating between the desired signal and signals or interference at other frequencies. *See also:* transducer. (EEC/PE) [119]

(2) **(attenuator) (characteristic insertion loss)** Peak-to-peak variation in decibels through the specified frequency range. (IM/HFIM) 474-1973w

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