

GLOSSARY

A

A/D (Analog to Digital)

Conversion of continuously varying (analog) voltage levels to discrete binary-numbered (digital) values (e.g., a load cell output can be fed through an A/D convertor to produce a continuous stream of digitized information and sent to a digital indicator).

ACCUMULATOR

A circuit or register device in a computer that receives, totals and stores numbers.

ACCURACY

Precision in the measurement of quantities and in the statement of physical characteristics. Accuracy is expressed in terms of error as a percentage of the specified value (e.g., 10 volts \pm 1%), as a percentage of a range (e.g., 2% of full scale), or as parts (e.g., 100 parts per million).

AMBIENT CONDITIONS

The conditions (humidity, pressure, temperature, etc.) of the medium surrounding the load cell.

AMPERE

Unit of electrical current intensity. One ampere of current is 6.24×10^{18} electrons passing a point in one second; often shortened to "amp".

ANALOG

Anything that corresponds, point for point or value for value, to an otherwise unrelated quantity; data represented by continuous values rather than in discrete steps.

ANGULAR LOAD, CONCENTRIC

(Common Center)

A load applied concentric with the primary axis at the point of application, and at some angle with respect to the primary axis.

ANGULAR LOAD, ECCENTRIC

(Off Center)

A load applied eccentric with the primary axis at the point of application and at some angle with respect to the primary axis.

APERTURE

The total range (in percentage) of full scale capacity over which a digital weight indicator's "Automatic Zero Maintenance" (AZM) and "Push-button Auto Zero" (PAZ) functions will operate; Handbook 44 maximum is +2% of full scale.

APPROVED

Acceptable to the authority having jurisdiction over the area for in which a system or equipment will be used.

ASCII (American Standard Code for Information Interchange)

Pronounced "askee." A seven-bit plus parity code established by the American National Standards Institute (ANSI) to achieve compatibility between data services.

ASSOCIATED APPARATUS

Apparatus in which the circuits are not necessarily intrinsically safe themselves, but may affect the energy in the intrinsically safe circuits and are relied upon to maintain intrinsic safety. An associated apparatus has identified intrinsically safe connections for intrinsically safe apparatus and may also have connections for non-intrinsically safe apparatus.

ASYNCHRONOUS TRANSMISSION

Data transmission in which time intervals between transmitted characters may be of unequal length. Transmission is controlled by start bits at the beginning of each character and stop bits at the end of each character.

AUTHORITY HAVING JURISDICTION

Where public safety is primary, the "Authority Having Jurisdiction" may be a federal, state, local or other regional institution, department or individual. Some examples are a fire chief, fire marshal, chief of a fire protection bureau, labor department, health department, building official, electrical inspector or other having statutory authority. For insurance purposes, an insurance inspection department rating bureau or other insurance company representative may be the "Authority Having Jurisdiction".

AIT (Auto Ignition Temperature)

The minimum temperature required for a substance to initiate or cause self-sustained combustion independently of the heating or heated equipment. Also referred to as ignition temperature.

AZM (Automatic Zero Maintenance)

An electronic means of providing "true zero" at all times on a digital scale. AZM compensates for such conditions as indicator or load cell drift or debris on a scale platform by electronically tracking out minor variations around zero; also called "zero tracking".

AVERAGE PIECE WEIGHT (APW)

On a counting scale, the amount of weight divided by the number of samples which comprised that weight. APW is used by the counting scale to count pieces during normal operation.

AXIAL LOAD

A load applied along a line concentric with the primary axis.

B

BAUD

A unit of communications processing speed in digital data communications systems. The speed in baud is the number of discrete conditions of signal events per second. If each signal event represents only one bit condition, baud rate equals bits per second (BPS).

BCD (Binary Coded Decimal)

A data coding system in which four binary bits represent the decimal numbers 0 through 9. The BCD equivalent of the decimal number 187 is 0001 1000 0111.

BEAM

The indicating device of a lever scale.

BEZEL

A holder designed to receive and position the edges of a lens, meter, window or display.

BIDIRECTIONAL

Data flow in either direction on a wire between pieces of equipment. Each equipment item can both receive and transmit data.

BIT

The smallest unit of information in a binary system, consisting of a "0" or a "1" (formed from Binary Digit).

BLACKOUT

A sudden loss of AC line power usually as a result of an overload or other power failure.

BOARD OF GOVERNORS

National Conference on Weights and Measures body of officials that sets NTEP policy and has final say in disputes.

BRIDGE CIRCUIT

A network of four "leg" components connected so that the input signal may be applied across two branches in parallel and the output signal taken between two points, one on each side of the parallel branches. At some ratio of the resultant four arms of the circuit, the output points are at the same potential, and the output voltage is zero. The bridge then is said to be balanced or set to null.

BROWNOUT

A deliberate lowering of line voltage by a power company to reduce load demands.

GLOSSARY

C

CALIBRATION

The comparison of load cell outputs against standard test loads.

CALIBRATION CURVE

A record (graph) of the comparison of load cell outputs against standard test loads.

CANTILEVER BEAM

A beam-type load cell that has a machined-out center. The load sensing elements (strain gauges) are mounted on the inside perimeter of this machined center.

CAPACITANCE

The ability of a component or material to store an electrostatic charge; measured in farads. Because the farad is a very large quantity, capacitance in electronic applications is usually expressed in millionths of a farad (microfarads) or millionths of a millionth of a farad (pico farads).

CERMET

An alloy of ceramic and metal, usually titanium carbide and nickel, used as a resistance element in some variable resistors; acronym of ceramic metal.

CHECK RODS

Rods installed to prevent a vessel or other weighing system component from gross tipping or extended travel. They do not interfere with normal travel or expansion.

CHECKWEIGHER

A scale used to verify predetermined weight within prescribed limits.

CLASS III

Classes of scales used in commercial weighing not otherwise specified; grain test scales, retail precious metals and semiprecious gem weighing, animal scales, postal scales, and scales used to determine laundry charges.

CLASS IIII

Vehicle, axle-load, livestock, railway track scales, crane and hopper (other than grain hopper) scales.

CLC (Concentrated Load Capacity)

Maximum load designated by the manufacturer that can be placed anywhere on the platform of a vehicle, axle-load or livestock scale using the prescribed test pattern (an area at least 4 feet long and as wide as the scale platform).

CMOS (Complementary Metal Oxide Semiconductor)

Chip technology characterized by a low power requirement and a high noise immunity. CMOS chips are susceptible to damage by electrostatic discharge (ESD).

CC (NTEP Certificate of Conformance)

Certification that a device meets all applicable requirements of Handbook 44.

COMBINED ERROR

(Non-linearity and Hysteresis)

The maximum deviation from the straight line drawn between the original no-load and rated load outputs expressed as a percentage of the rated output and measured on both increasing and decreasing loads.

COMPENSATION

The utilization of supplementary devices, materials or processes to minimize known sources of error.

COMPRESSION

A force applied to a strain gauge that causes the gauge wires to compress and their cross-sectional area to increase, thus decreasing the gauge resistance.

CONFORMALLY COATED

Refers to load cells which have a protective coating applied over the strain gauges, terminal strip, etc., within the gauged cavity. The cavity opening may additionally be covered with side plates to protect against physical damage. These cells are suitable for normal indoor applications; they should not be used in wet or washdown applications.

CONTINUOUS MODE

Transmission of serial output data in which the data is transmitted automatically following each indicator display update; usually used to interface indicators to computers, score boards and other remote devices requiring constant data updating.

CONTROL DRAWING

A drawing or document provided by the manufacturer of the intrinsically safe or associated apparatus that details the allowed interconnections between the intrinsically safe and associated apparatus.

CPU (Central Processing Unit)

The computer module or chip that controls fetching, decoding and executing instructions; controls processing operations for the device.

CREEP

The change in load cell output occurring with time, while under load, and with all environmental conditions and other variables remaining constant; usually measured with Rated Load applied and expressed as a percent of Rated Output over a specific period of time.

CREEP RECOVERY

The change in no-load output occurring with time, after removal of a load which has been applied for a specific period of time; usually measured over a specified time period immediately following removal of rated load and expressed as a percent of rated output.

CURRENT

Flow of electrons past a point in a specified period of time; measured in amperes.

CURRENT LOOP

A current-based method of serial communications between digital devices; a logic high is represented by current flowing in the loop; a logic "low" is represented by a lack of current flowing in the loop.

D

d (Division)

Value of the smallest increment indicated (displayed) by a scale.

DASH POT

A dampening device used to reduce scale oscillations.

DEAD LOAD

The fixed force of the weigh bridge, platform, and other load-supporting structures of the scale, the value of which is to be permanently balanced or cancelled out in the weight or measuring system

DEFLECTION

The change in length along the Primary Axis of the load cell between no-load and Rated Load conditions.

DEMAND MODE

Transmission of serial output data which requires a manual "Print" command to initiate the output data. Usually used to interface indicators to printers.

DIGITAL

System of signal representation employing discrete rather than continuously variable (analog) values.

DIGITAL AVERAGING

The ability of a digital indicator to smooth bouncy or erratic readings by taking several readings and averaging them together before sending the signal to the display. Increasing the digital averaging slows the indicator's update rate.

DIP (Dual Inline Package)

An integrated circuit contained within a standard housing characterized by its low profile, rectangular body, and symmetrical placement of leads along two opposing sides of the device.

DORMANT SCALE

A built-in scale having a self-contained under structure.

DOT MATRIX

A method of printing in which a rectangular array (matrix) of spaces are filled in to form alphanumeric and punctuation characters.

DRIBBLE

In filling operations, the weight value over which material is slowly handled to provide a more accurate cutoff.

DROPOUT

A temporary loss of electrical power normally caused by utility and maintenance switching functions where break-before-make switching strategies are used.

E

e (Verification Scale Division)

Value of a verification scale division specified by the manufacturer; sets value for tolerances and accuracy class.

e_{min} (Minimum Verification Scale Divisions)

The minimum scale division or value for which a device complies with applicable requirements, e.g., bench or counter scale.

ECCENTRIC LOAD

Any load applied parallel to, but not concentric with, the Primary Axis.

EEPROM (Electrically Erasable Programmable Read Only Memory)

A data storage component whose data can be repeatedly read out; the stored data can be erased by an electrical signal and new data then can be programmed into the component.

ELECTRICAL NOISE

Extraneous undesirable currents or voltages which interfere with desirable electrical quantities. Some causes are distant lightning, radio transmitters, welding equipment, electrical switching equipment, poor brush contact on motors, and other electronic devices utilizing switching power supplies.

ELECTRON

A negatively-charged subatomic particle that orbits the nucleus of an atom. Electrical current is the flow of electrons.

ELECTROSTATIC CHARGE

An electric charge on the surface of an insulated object.

EMI (Electromagnetic Interference)

Interference caused by electrical fields due to capacitive coupling, or magnetic fields due to mutual inductance of electromagnetic fields (radio waves).

ENVIRONMENTALLY PROTECTED

Refers to load cells which have a strain gauge cavity filled with a potting compound. The cavity opening is also generally protected with loose-fitting side plates or molded plastic to protect against physical damage. These cells are protected from normal environmental factors in indoor or outdoor applications. They should not be submersed or washed down.

EPROM (Erasable Programmable Read Only Memory)

A data storage component whose data can be repeatedly read out; the stored data can be erased by applying ultraviolet light, and new data then can be programmed into the component.

ERROR

The algebraic difference between the indicated and true value of the load being measured.

ESD (Electrostatic Discharge)

A rapid discharge of an electrostatic potential that can cause damage to integrated circuits.

EXCITATION

The voltage or current applied to the input terminals of the load cell.

EXCITATION TRIM

Method of matching load cell outputs in a multicell system by adjusting the excitation voltage to each individual load cell. Adjustment is made by changing the setting of a variable resistor in series with the excitation input.

EXPLOSION PROOF ENCLOSURE

An enclosure that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of the gas surrounding the enclosure. The enclosure also must operate at such an external temperature so that it is incapable of igniting its surrounding atmosphere.

F**FACTORY MUTUAL (FM) SYSTEM APPROVED**

All products displaying this symbol have been approved for use in hazardous (classified) locations when following the proper installation procedures and drawings, and utilizing intrinsic safety barriers.

FLEXURES

Thin steel or plastic bands or plates which replace the pivots and bearings of a conventional scale, allowing less movement and reducing friction.

FULCRUM

A pivot point for a lever.

FULL DUPLEX

Simultaneous, two-way, independent data transmission in both directions.

G**GATED POWER SUPPLY**

A power supply that allows conduction only when signal magnitude is within specified limits.

GRADUATION

A mark on an instrument or vessel indicating degrees or quantity.

H**HALF DUPLEX**

Data transmission in both directions, but not simultaneously (see Full Duplex).

HANDBOOK 44 (H-44)

A comprehensive set of requirements for weighing and measuring devices that are used in commerce and law enforcement activities; not a federal law, but developed and updated annually by the National Conference on Weights and Measures. Its complete title is "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."

HANDSHAKING

Exchange of predetermined signals between two devices for purpose of control.

HAZARDOUS (CLASSIFIED) LOCATION

A location where fire or explosion hazards may exist due to the presence of flammable gases or vapors, flammable liquids, combustible dust or easily-ignitable fibers or flyings.

HERMETICALLY SEALED

Refers to load cells which have a metallic protective cover welded or soldered in place to protect the strain gauge cavity. Some cells of this type have additional protection at the cable entry such as a glass-to-metal seal. These load cells provide the best possible protection in harsh chemical or washdown environments.

HIGH PASS FILTER

A filter passing frequency components above a designated frequency and rejecting components below that frequency.

HYSTERESIS

The maximum difference between load cell output readings for the same applied load. One reading is obtained by increasing the load from zero and the other reading is obtained by decreasing the load from rated load. Measurements should be taken as rapidly as possible to minimize creep.

GLOSSARY

INFLUENCE FACTORS

Environmental elements that may alter or interrupt an electronic or mechanical indication (e.g., temperature, humidity, radio frequency interference, barometric pressure, electric power).

INTERFACE

A device or circuit that allows two units to communicate. Some of the standard interfaces used in the scale industry are 20 mA current loop, BCD, RS-232, RS-422 and RS-485.

INTRINSICALLY SAFE CIRCUIT

A circuit in which any spark or thermal effect is incapable of causing ignition of a mixture of flammable or combustible material in air under prescribed test conditions in its most easily ignitable concentration.

INTRINSICALLY SAFE SYSTEM

An assembly of interconnected intrinsically safe apparatus, associated apparatus and interconnecting cables in which the parts of the system, which may be used in hazardous (classified) locations, are intrinsically safe circuits; may include more than one intrinsically safe circuit.

INTRINSIC SAFETY BARRIER

A network designed to limit the energy (voltage and current) available to the protected circuit in the hazardous (classified) location under specified fault conditions.

INTRINSIC SAFETY GROUND BUS

A grounding system that has a dedicated conductor, separate from the power system, so ground currents will not normally flow, and which is reliably connected to a ground electrode in accordance with Article 200 of the NEC.

INSULATION RESISTANCE

The DC resistance measured between the load cell circuit and the load cell structure; normally measured at fifty volts DC and under standard test conditions.

INTERNATIONAL PROTECTION (IP) RATING

A rating system that defines a product's or enclosure's protection against the ingress of solid objects and liquids. See page 257 for a chart defining the IP rating system.

I/O (Input/Output)

The circuits or devices that allow a digital unit to send (output) data and receive (input) data.

J

J-BOX (Junction Box)

A box or enclosure used to join different runs of cable or wiring; it contains space and terminals for connecting and branching the enclosed conductors and adjustments to provide load cell trimming.

L

LATCH

To maintain a closed (energized) state in a pair of relay contacts after initial energization from a single electrical pulse.

LATCHING RELAY

A relay which locks into the mode for which it is energized (On or Off); requires a start-stop button; once activated it stays activated until the setpoint is reached or the stop button is pushed.

LED (Light Emitting Diode)

A semiconductor light source that emits visible light or invisible infrared radiation.

LEVER

A tool that transfers force equally with reduction or multiplication.

LIVE LOAD

The load applied to a scale base that is actually being measured by the weighing system.

LOAD

The weight or force applied to the load cell.

LOAD CELL

A device which produces an output signal proportional to the applied weight or force. Types of load cells include beam, S-beam, platform, compression and tension.

LOW PASS FILTER

A filter which passes frequency components below a designated frequency and rejecting components above that frequency.

M

MASS

The quantity of matter in a body.

MEGOHMMETER

A special ohmmeter for measuring resistances in the megohm (10^6 ohms) range; also called a megger.

METAL FILM RESISTOR

A fixed or variable resistor in which the resistance element is a thin or thick film of a metal alloy deposited on a substrate made of plastic or ceramic material.

MICRO

A prefix meaning millionths (10^{-6}); symbol is "μ".

MICROVOLTS PER GRADUATION

The number of microvolts of live load signal that are needed to change the display.

MINIMUM DEAD LOAD-Load Cells

Minimum dead load is specified for NTEP load cells. In a given application, the dead load applied to each cell must be greater than or equal to the minimum dead load specified by the load cell manufacturer.

MOTION DETECTION

A circuit used in an indicator to sense when the displayed weight data is changing at a greater rate than preset limits (or is unstable) and to inhibit certain functions during this time. Functions inhibited may be data output, entry of a push-button auto zero, entry of an auto tare value or activation of zero tracking.

MOV (Metal Oxide Varistor)

A voltage-dependent resistor whose resistance predictably changes with voltage applied; used in transient protectors as a shunt protection device.

N

n_{max} (Maximum Number of Scale Divisions)

The maximum number of scale divisions for which a product has been approved. The n_{max} must be greater than or equal to the number of divisions for which the scale will be configured.

NEGATIVE LOGIC

Binary logic in which a high negative state represents a "1" condition and a low negative state represents a "0" state.

NEMA

National Electrical Manufacturers Association.

NCWM (National Conference on Weights and Measures)

An association of state and local officials. Federal and industry representatives that adopt uniform (model) laws and regulations (e.g., NIST Handbook 44).

NIST (National Institute for Standards and Technology)

An agency of the federal government to which all precision measurements are traceable. Formerly the National Bureau of Standards (NBS)

NOMINAL LOAD CAPACITY

The designed normal maximum load cell capacity. Output load cell sensitivity is based on this capacity unless otherwise specified.

NON-LATCHING RELAYS

Relays that will stay at the logic level based on the current setpoint data. These relays will “toggle” from energized to de-energized states depending on the signal sent to them.

NON-LINEARITY

The maximum deviation of the calibration curve from a straight line drawn between the no-load and rated load outputs, expressed as a percentage of the rated output and measured on increasing load only.

NONVOLATILE MEMORY

A computer storage medium whose contents remain unaltered when the power is switched off; contents are available when power is switched on again.

NTEP (National Type Evaluation Program)

A program of cooperation between the National Conference On Weights & Measures, NIST, state weights and measures officials and the private sector for determining conformance of weighing equipment with the provisions of H-44.

O**OEM (Original Equipment Manufacturer)**

A manufacturer who produces equipment for use or inclusion by another manufacturer in its product.

OHM

The unit of electrical resistance. The resistance through which a current of one ampere will flow when a voltage of one volt is applied.

OHM'S LAW

The relationship between current, voltage and resistance. Current varies directly with voltage, and inversely with resistance ($I = E/R$, where $I =$ Current, $E =$ Voltage and $R =$ Resistance).

OUTPUT

The signal (voltage, current, pressure, etc.) produced by a load cell. Where the output is directly proportional to excitation, the signal must be expressed in terms such as Volts per Volt, Millivolts per Volt, or Volts per Ampere, etc., of excitation.

OUTPUT, Rated

The algebraic difference between the Outputs at no-load and at Rated Load.

OVERLOAD RATING, Safe

The maximum load, in percent of Rated Capacity, which can be applied without producing a permanent shift in performance characteristics beyond those specified.

OVERLOAD RATING, Ultimate

The maximum load, in percent of Rated Capacity, which can be applied without producing a structural failure.

OWM

Office of Weights and Measures at NIST.

OIML (International Organization of Legal Metrology)

Treaty organization that recommends technical requirements for weighing and measuring equipment prior to the sale or distribution of a model or type within the state, nation, etc.

P**PARALLEL CIRCUIT**

A circuit in which the components are connected across each other. The voltage applied to each component is the same.

PARALLEL COMMUNICATIONS

Type of data communication in which all elements in an information item (bits in a word) are acted upon simultaneously, rather than one at a time as in serial communications.

PARITY

A method of error checking where an extra bit is sent to establish an even or odd number of ones in the data of a character.

PAZ (Push-button Auto Zero)

Extension of the AZM function of a digital weight indicator through the use of a front-panel push-button.

POISE

A moveable weight that counterbalances the load on a scale.

PORT

A point at which signals may be introduced to or extracted from a circuit, device, or system.

POTENTIOMETER

A variable resistor employed as a voltage divider.

POTTED CELL

A load cell which is environmentally sealed by filling the strain gauge cavity with a material that protects the gauges from environmental hazards such as moisture. The potting material must not interfere with normal strain gauge movement, and allow the gauges to return to their normal zero output position.

PREACT

Weight value which is set to allow for material in suspension during a filling operation.

PRESSURIZATION

The process of supplying an enclosure with clean air or an inert gas with or without continuous flow at sufficient pressure to prevent the entrance of combustible dust.

PRIMARY AXIS

The axis along which the load cell is designed to be loaded; normally its geometric center line.

PROTECTIVE COMPONENT

A component or assembly which is so unlikely to become defective in a manner that will lower the intrinsic safety of the circuit that it may be considered not subject to fault when analysis or tests for intrinsic safety are made.

PURGING

The process of supplying an enclosure with clean air or an inert gas at sufficient flow and positive pressure to reduce, to an acceptable safe level, the concentration of any flammable gases or vapors initially present, and to maintain this safe level by positive pressure with or without continuous flow.

R**RACEWAY**

An enclosed channel designed for holding wires, cables, or busbars.

RAINPROOF

An enclosure so constructed, protected, or treated, as to prevent rain from interfering with the successful operation of the apparatus under specified test conditions.

RAINTIGHT

An enclosure so constructed or protected that exposure to a beating rain will not result in the entrance of water under specified test conditions.

RAM (Random Access Memory)

A data storage device that can be accessed in any order. It is known as a read/write memory, as information can be written into the memory, then read out when needed by the microprocessor. The contents of RAM are lost when the system is powered down.

REACTANCE

The opposition offered to the flow of alternating current by pure capacitance, pure inductance, or a combination of the two. Its unit is the “ohm”.

REFERENCE STANDARD

A force-measuring device whose characteristics are precisely known relative to a primary standard.

GLOSSARY

REMOTE SENSING

A method of regulating the excitation voltage to the load cells. Some indicators compensate for voltage drops occurring between the indicator and load cells by increasing the indicator excitation output voltage; other indicators compensate for this voltage drop by amplifying the load cell return signal.

REPEATABILITY

The maximum difference between load cell output readings for repeated loadings under identical loading and environmental conditions; the ability of an instrument, system, or method to give identical performance or results in successive instances.

RESISTANCE

Opposition to current flow offered by a purely resistive component; simple opposition to current flow. Measured in ohms. See REACTANCE.

RESISTIVITY

The electrical resistance offered by a unit cube of material to the flow of direct current between opposite faces of the cube. It is measured in "ohm-centimeters."

RESOLUTION

The smallest change in mechanical input which produces a detectable change in the output signal.

RFI (Radio Frequency Interference)

Radio frequency energy of sufficient magnitude to possibly affect operation of other electrical equipment.

ROM (Read Only Memory)

A memory unit in which instructions or data are permanently stored for use by the machine or for reference by the user. The stored information is read out non-destructively and no information can subsequently be written into the memory.

RS-232

A voltage-based serial method of data communication used to transfer data between digital devices. Two wires carry the data; one wire is signal ground, and several control wires may be used for handshaking. A logic "high" is from -3 to -25 volts and a logic "low" is from +3 to +25 volts. Transmission distance should be restricted to 50 feet.

S

SAFETY FACTOR

A figure denoting the overload (and allowance thereof) a device can withstand before breaking down.

SCALE

A device for weighing, comparing and determining weight or mass.

SENSITIVITY

The ratio of the change in output to the change in mechanical input.

SERIAL TRANSMISSION

A method of data transmission in which each bit of information is sent sequentially on a single channel.

SETPOINT

In a feedback control loop, the point which determines the desired value of the quantity being controlled.

SHEAR BEAM

A bending beam load cell in which the strain gauges are mounted on a thin web of material in a machined-out cavity in the load cell.

SHIFT TEST

A test intended to disclose the weighing performance of a scale under off-center loading.

SIDE LOAD

Any load acting 90° to the primary axis at the point of axial load applications.

SIGNAL TRIM

A method of matching load cell outputs in a multicell system by adjusting the output signal voltage through a variable resistor placed across the signal leads.

SIP (Signal In-Line Package)

A flat, molded component package having terminal lugs along one side; half of a dual in-line package (DIP).

SPAN

The difference between the highest value and the lowest value.

STABILIZATION PERIOD

The time required to ensure that any further change in the parameter being measured is tolerable.

STACK

A temporary storage area in a computer memory consisting of a small group of registers. Data stored in the stack is retrieved from the stack in reverse order in which it is stored.

STANDARD TEST CONDITIONS

The environmental conditions under which measurements should be made, when measurements under any other conditions may result in disagreement between various observers at different times and places. The conditions are as follows: Temperature: 72° ± 3.6°F (23° ± 2°C) Barometric Pressure: 28 to 32 inches Hg.

STATIC OVERLOAD CAPACITY

Capacity as a percentage of nominal load limit capacity, in which the load cell can safely be loaded to this limit with no adverse effect on the performance or any change in its zero balance or other specifications.

STAY RODS

Rods installed to rigidly restrain a vessel or other weighing system component in the horizontal position. They will have little effect on the accuracy of the system when installed properly.

STRAIN GAUGE

A device for detecting the strain that a certain force produces on a body. The gauge consists of one or more fine wires cemented to the surface under test. As the surface becomes strained, the wires stretch or compress, changing their resistance. Several strain gauges are used to make up a load cell.

T

TARE

The weight of an empty container or vehicle, or the allowance or deduction from gross weight made on account thereof.

TEMPERATURE COEFFICIENT

A figure which states the extent to which a quantity drifts under the influence of temperature.

TEMPERATURE EFFECT, On Rated Output

The change in rated output due to a change in ambient temperature. Usually expressed as the percentage change in rated output per 100°F change in ambient temperature.

TEMPERATURE EFFECT, On Zero Balance

The change in zero balance due to a change in ambient temperature. Usually expressed as the change in zero balance in percent of rated output per 100°F change in ambient temperature.

TEMPERATURE RANGE, Compensated

The range of temperatures over which the load cell is compensated to maintain rated output and zero balance within specific limits.

TEMPERATURE RANGE, Safe

The extremes of temperatures within which the load cell will operate without permanent adverse change to any of its performance characteristics.

TERMINAL RESISTANCE, Corner to Corner

The resistance of the load cell circuit measured at specific adjacent bridge terminals at standard temperature with no load applied and with the excitation and output terminals open-circuited.

TERMINAL RESISTANCE, Input (Excitation)

The resistance of the load cell circuit measured at the excitation terminals at standard temperature with no load applied and with the output (signal) terminals open-circuited.

TERMINAL RESISTANCE, Output (Signal)

The resistance of the load cell circuit measured at the output signal terminals at standard temperature with no load applied and with the excitation terminals open-circuited.

TOLERANCE

The amount of error that is allowed in a value. It is usually expressed as a percent of nominal value, plus or minus so many units of measurement.

TRACEABILITY

The step-by-step transfer process by which the load cell calibration can be related to primary standards.

TRANSDUCER

A device that converts energy from one form to another.

TRANSIENT

A momentary surge on a signal or power line. It may produce false signals or triggering impulses and cause insulation or component breakdowns and failures.

TRIAC

A three-terminal, gate controlled, bidirectional silicon switching device that can switch either alternating or direct currents.

TRIM

To make a fine adjustment, as of load cell outputs in a multicell system.

V

v_{min} (Minimum Verification Scale Division/Load Cell)

A parameter used to select load cells for NTEP approved applications. For single cell applications, v_{min} must be less than or equal to the scale division size; for mechanical scale conversions using one load cell, v_{min} must be less than or equal to the scale division size divided by the scale multiple. For a scale using more than one load cell, v_{min} must be less than or equal to the scale division divided by the square root of the number of cells.

VOLATILE MEMORY

A computer storage medium whose contents are lost when there is a loss of power.

VOLT

The unit of voltage, potential difference and electromotive force. One volt will send a current of one ampere through a resistance of one ohm.

VOLTAGE

The electrical potential difference that exists between two points and is capable of producing a flow of current when a closed circuit is connected between the two points.

VOLTAGE DIP

A temporary decrease in voltage level lasting at least one alternating current cycle.

VOLTAGE SPIKE

Large damaging voltage pulse caused when lightning strikes a power line, communication line, a signal or sensing line, or even the ground nearby.

VOLTAGE SURGE

A temporary rise in voltage level lasting at least one alternating current cycle.

W**WATER-PIPE GROUND**

An earth connection made by running a strong wire to the nearest cold water pipe.

WATER TIGHT

An enclosure so constructed that moisture will not enter the enclosure under specified test conditions.

WEATHER PROOF

An enclosure so constructed or protected that exposure to the weather will not interfere with successful operation of its contained equipment.

WEIGHT

The force or amount of gravitational pull by which an object or body is attracted toward the center of the earth.

Z**ZENER DIODE**

A semiconductor diode which is used in the reverse biased condition. It exhibits a nondestructive breakdown at a predetermined reverse voltage, so while the diode is operating in this breakdown region, an increase in current flow through the diode will not result in increased voltage drop across the diode. It is used in voltage regulation circuits and as a voltage limiting device in intrinsic safety barriers.

ZERO BALANCE

The output signal of the load cell with rated Excitation and with no load applied, usually expressed in percent of Rated Output.

ZERO RETURN

The difference in Zero Balance measured immediately before Rated Load application of specified duration, measured after removal of the load, and when the output has stabilized.

ZERO SHIFT, Permanent

A permanent change in no-load output.

ZERO STABILITY

The degree to which the load cell maintains its Zero Balance with all environmental conditions and other variables remaining constant.