Appendix 1
Terminology
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Terminology

The introduction of computer technology means that the Protection Engineer must now be familiar with a range of technical terms in this field, in addition to the terms long associated with Protection and Control. Below is a list of terms and their meanings that are now commonly encountered in the Protection and Control field.

AC
Alternating Current

ACB
Air Circuit Breaker

Accuracy
The accuracy of a transducer is defined by the limits of intrinsic error and by the limits of variations.

Accuracy class
A number used to indicate the accuracy range of a measurement transducer, according to a defined standard.

Active power (watt) transducer
A transducer used for the measurement of active electrical power

ADC
Analogue to Digital Converter

A/D Conversion
The process of converting an analogue signal into an equivalent digital one, involving the use of an analogue to digital converter

Adjustment
The operation intended to bring a transducer into a state of performance suitable for its use

AGC
Automatic Gain Control

AI
Analogue Input

AIS
Air Insulated Switchgear
Alarm
An alarm is any event (see below) tagged as an alarm during the configuration phase.

All-or-nothing relay
An electrical relay which is intended to be energised by a quantity, whose value is either higher than that at which it picks up or lower than that at which it drops out.

Anti-pumping device
A feature incorporated in a Circuit Breaker or reclosing scheme to prevent repeated operation where the closing impulse lasts longer than the sum of the relay and CB operating times.

AO
Analogue Output.

AR
Auto Reclose: A function associated with CB, implemented to carry out reclosure automatically to try to clear a transient fault.

ARBITER
Proprietary protocol for time synchronisation from ARBITER Systems, Inc. Paso Robles, California USA.

Arcing time
The time between instant of separation of the CB contacts and the instant of arc extinction.

Auto-transformer
A power transformer that does not provide galvanic isolation between primary and secondary windings.

AUX
 Auxiliary.

Auxiliary circuit
A circuit which is usually energised by the auxiliary supply but is sometimes energised by the measured quantity.

Auxiliary relay
An all-or-nothing relay energised via another relay, for example a measuring relay, for the purpose of providing higher rated contacts, or introducing a time delay, or providing multiple outputs from a single input.

Auxiliary supply
An a.c. or d.c. electrical supply other than the measured quantity which is necessary for the correct operation of the transducer.

AVR
Automatic Voltage Regulator.

Back-up protection
A protection system intended to supplement the main protection in case the latter should be ineffective, or to deal with faults in those parts of the power system that are not readily included in the operating zones of the main protection.

Bay
Set of LV, MV, or HV plant and devices, usually controlled by a bay computer.

BC
Bay Computer. Computer dedicated to the control of one or several bays within a substation.

BCD
Binary Coded Decimal.

BCP
Bay Control Point. A local keypad at bay level to control the elements of a single bay.

Biased relay
A relay in which the characteristics are modified by the introduction of some quantity other than the actuating quantity, and which is usually in opposition to the actuating quantity.

Bias current
The current used as a bias quantity in a biased relay.

BIOS
Basic Input/Output System (of a computer or microprocessor).

BT
Booster Transformer.

Booster Transformer
A current transformer whose primary winding is in series with the catenary and secondary winding in the return conductor of a classically-fed a.c. overhead electrified railway. Used at intervals to ensure that stray traction return currents, with their potential to cause interference in nearby communication circuits, are minimised.

Burden
The loading imposed by the circuits of the relay on the energising power source or sources, expressed as the product of voltage and current (volt-amperes, or watts if d.c.) for a given condition, which may be either at ‘setting’ or at rated current or voltage. The rated output of measuring transformers, expressed in VA, is always at rated current or voltage and it is important, in assessing the burden imposed by a relay, to ensure that the value of burden at rated current is used.

C
Capacitance.

CAD
Computer Aided Design.

Calibration
The set of operations which establish, under specified conditions, the relationship between values indicated by a transducer and the corresponding values of a quantity realized by a reference standard. (This should not be confused with ‘adjustment’, q.v.)
CB
Circuit Breaker

CBC
Compact Bay Controller. Small capacity bay computer for Medium Voltage applications

CBCT
Core Balance Current Transformer

CCR
Central Control Room

CDM
Conceptual Data Modelling is an activity whose aims are:
• to define objects and links and naming conventions for their identifications
• to guarantee interoperability between subsystems
• to define standard exchange formats between system configurator and subsystem configurators

Characteristic angle
The angle between the vectors representing two of the energising quantities applied to a relay and used for the declaration of the performance of the relay

Characteristic curve
The curve showing the operating value of the characteristic quantity corresponding to various values or combinations of the energising quantities

Characteristic Impedance Ratio (C.I.R.)
The maximum value of the System Impedance Ratio up to which the relay performance remains within the prescribed limits of accuracy

Characteristic quantity
A quantity, the value of which characterises the operation of the relay, for example, current for an overcurrent relay, voltage for a voltage relay, phase angle for a directional relay, time for an independent time delay relay, impedance for an impedance relay

Check protection system
An auxiliary protection system intended to prevent tripping due to inadvertent operation of the main protection system

CHP
Combined Heat and Power

Circuit insulation voltage
The highest circuit voltage to earth on which a circuit of a transducer may be used and which determines its voltage test

Class index
The number which designates the accuracy class

Closing Impulse time
The time during which a closing impulse is given to the CB

Closing Time
The time for a CB to close, from the time of energisation of the closing circuit to making of the CB contacts

Compliance voltage (accuracy limiting output voltage)
For current output signals only, the output voltage up to which the transducer meets its accuracy specification

Conjunctive test
A test of a protection system including all relevant components and ancillary equipment appropriately interconnected. The test may be parametric or specific

Conversion coefficient
The relationship of the value of the measurand to the corresponding value of the output

Core Balance Current Transformer
A ring-type Current Transformer in which all primary conductors are passed through the aperture of the CBCT. Hence the secondary current is proportional only to any imbalance in current. Used for sensitive earth-fault protection

Counting Relay
A relay that counts the number of times it is energised and actuates an output after a desired count has been reached.

CSV
Character (or Comma) Separated Values format. A widely used format for the exchange of data between different software, in which the individual data items are separated by a known character – usually a comma

CT
Current Transformer

Current transducer
A transducer used for the measurement of a.c. current

CVT
Capacitor Voltage Transformer. A voltage transformer that uses capacitors to obtain a voltage divider effect. Used at EHV voltages instead of an electromagnetic VT for size/cost reasons

DAC
Digital to Analogue Converter

DAR
Delayed auto-reclose

DAT
Digital Audio Tape

DBMS
Data Base Management system

DCF77
LF transmitter located at Mainflingen, Germany, broadcasting a time signal on a 77.5kHz frequency
DCP
Device Control Point: local keypad on device level to control the switchgear, often combined with local/remote switch

DCS
Distributed Control System

Dead Time (auto-reclose)
The time between the fault arc being extinguished and the CB contacts re-making

De-ionisation time (auto-reclose)
The time required for dispersion of ionised air after a fault is cleared so that the arc will not re-strike on re-energisation

Delayed Auto-Reclose
An auto-reclosing scheme which has a time delay in excess of the minimum required for successful operation

Dependent time measuring relay
A measuring relay for which times depend, in a specified manner, on the value of the characteristic quantity

DFT
Discrete Fourier Transform

Digital Signal Processor
A microprocessor optimised in both hardware architecture and software instruction set for the processing of analogue signals digitally, through use of the DFT and similar techniques

Digital Signal Processing
A technique for the processing of digital signals by various filter algorithms to obtain some desired characteristics in the output. The input signal to the processing algorithm is usually the digital representation of an analogue signal, obtained by A/D conversion

Directional relay
A protection relay in which the tripping decision is dependent in part upon the direction in which the measured quantity is flowing

Discrimination
The ability of a protection system to distinguish between power system conditions for which it is intended to operate and those for which it is not intended to operate

Distortion factor
The ratio of the r.m.s. value of the harmonic content to the r.m.s. value of the non-sinusoidal quantity

DNP
Distributed Network Protocol. A proprietary communication protocol used on secondary networks between HMI, substation computers or Bay Computers and protective devices

DOL
Direct-on-Line

Direct-on-Line
A method of motor starting, in which full line voltage is applied to a stationary motor

Drop-out (or drop-off)
A relay drops out when it moves from the energised position to the un-energised position

Drop-out/pick-up ratio
The ratio of the limiting values of the characteristic quantity at which the relay resets and operates. This value is sometimes called the differential of the relay

DSP
Digital Signal Processing

DT
Definite time

Earth fault protection system
A protection system which is designed to respond only to faults to earth

Earthing transformer
A three-phase transformer intended essentially to provide a neutral point to a power system for the purpose of earthing

Effective range
The range of values of the characteristic quantity or quantities, or of the energising quantities to which the relay will respond and satisfy the requirements concerning it, in particular those concerning precision

Effective setting
The 'setting' of a protection system including the effects of current transformers. The effective setting can be expressed in terms of primary current or secondary current from the current transformers and is so designated as appropriate

Electrical relay
A device designed to produce sudden predetermined changes in one or more electrical circuits after the appearance of certain conditions in the electrical circuit or circuits controlling it

NOTE: The term 'relay' includes all the ancillary equipment calibrated with the device

Electromechanical relay
An electrical relay in which the designed response is developed by the relative movement of mechanical elements under the action of a current in the input circuit

EMC
Electro-Magnetic Compatibility

Embedded generation
Generation that is connected to a distribution system (possibly at LV instead of HV) and hence poses particular problems in respect of electrical protection
e.m.f.
Electro-motive Force (or voltage)

Energising quantity
The electrical quantity, either current or voltage, which along or in combination with other energising quantities, must be applied to the relay to cause it to function

EPROM
Electrically Programmable Read Only Memory

Error (of a transducer)
The actual value of the output minus the intended value of the output, expressed algebraically

Event
An event is any information acquired or produced by the digital control system

FAT
Factory Acceptance Test. Validation procedures witnessed by the customer at the factory

Fault Passage Indicator
A sensor that detects the passage of current in excess of a set value (i.e. current due to a fault) at the location of the sensor. Hence, it indicates that the fault lies downstream of the sensor

FBD
Functional Block Diagram: One of the IEC 61131-3 programming languages

Fiducial value
A clearly specified value to which reference is made in order to specify the accuracy of a transducer. (For transducers, the fiducial value is the span, except for transducers having a reversible and symmetrical output when the fiducial value may be either the span or half the span as specified by the manufacturer. It is still common practice, however, for statements of accuracy for frequency transducers to refer to 'percent of centre-scale frequency' and, for phase angle transducers, to an error in electrical degrees.)

FPI
Fault Passage Indicator

Frequency transducer
A transducer used for the measurement of the frequency of an a.c. electrical quantity

Full duplex communications
A communications system in which data can travel simultaneously in both directions

Gateway
The Gateway is a computer which provides interfaces between the local computer system and one or several SCADA (or RCC) systems

GIS
Gas Insulated Switchgear (usually SF6)

Global Positioning System
A system used for locating objects on Earth precisely, using a system of satellites in geostationary orbit in Space. Used by some numerical relays to obtain accurate time information

GMT
Greenwich Mean Time

GPS
Global Positioning System

GTO
Gate Turn-off Thyristor

Half-duplex communications
A communications system in which data can travel in both directions, but only in one direction at a time

High-speed reclosing
A reclosing scheme where re-closure is carried out without any time delay other than that required for de-ionisation, etc.

HMI
Human Machine Interface. The means by which a human inputs data to and receives data from a computer-based system. Usually takes the form of a Personal Computer (PC) (desktop or portable) with keyboard, screen and pointing device

HRC
High Rupturing Capacity (applicable to fuses)

HSR
High Speed Reclosing

HV
High Voltage

HVDC
High Voltage Direct Current

I
Current

ICCP
Term used for IEC 60870-6-603 protocol

ICT
Interposing Current Transformer (software implemented)

I.D.M.T.
Inverse Definite Minimum Time

IGBT
Insulated Gate Bipolar Transistor

I/O
Input/Output

IED
Intelligent Electronic Device. Equipment containing a microprocessor and software used to implement one or more functions in relation to an item of electrical
equipment (e.g. a bay controller, remote SCADA interface/protocol converter). A microprocessor-based numerical relay is also an IED. IED is a generic term used to describe any microprocessor-based equipment, apart from a computer.

**IGBT**
Insulated Gate Bipolar Transistor

**Independent time measuring relay**
A measuring relay, the specified time for which can be considered as being independent, within specified limits, of the value of the characteristic quantity

**Influence quantity**
A quantity which is not the subject of the measurement but which influences the value of the output signal for a constant value of the measurand

**Input quantity**
The quantity, or one of the quantities, which constitute the signals received by the transducer from the measured system

**Instantaneous relay**
A relay that operates and resets with no intentional time delay.

**NOTE:** All relays require some time to operate; it is possible, within the above definition, to discuss the operating time characteristics of an instantaneous relay

**Insulated Gate Bipolar Transistor**
A special design of transistor that is suitable for handling high voltages and currents (relative to an ordinary transistor). Frequently used in static power control equipment (inverters, controlled rectifiers, etc) due to the flexibility of control of the output

**Intrinsic error**
An error determined when the transducer is under reference conditions

**Inverse time delay relay**
A dependent time delay relay having an operating time which is an inverse function of the electrical characteristic quantity

**Inverse time relay with definite minimum time (I.D.M.T.)**
An inverse time relay having an operating time that tends towards a minimum value with increasing values of the electrical characteristic quantity

**IRIG-B**
An international standard for time synchronisation

**ISO**
International Standards Organisation

**K-bus (K-bus Courier)**
Term used for the Courier protocol on K-Bus interface for K-Relay range manufactured by AREVA

**Knee-point e.m.f.**
That sinusoidal e.m.f. applied to the secondary terminals of a current transformer, which, when increased by 10%, causes the exciting current to increase by 50%

**L**
Inductance

**LAN**
Local Area Network

**LCD**
Liquid Crystal Display

**LED**
Light Emitting Diode

**LD**
Ladder Diagram. One of the IEC 61131-3 programming languages

**LDC**
Line drop compensator

**Limiting value of the output current**
The upper limit of output current which cannot, by design, be exceeded under any conditions

**Local Control Mode**
When set for a given control point it means that the commands can be issued from this point

**Lock-out (auto-reclose)**
Prevention of a CB reclosing after tripping

**Long-term stability**
The stability over a period of one year

**Low-speed auto-reclose**
See Delayed Auto-Reclose

**LV**
Low Voltage

**Main protection**
The protection system which is normally expected to operate in response to a fault in the protected zone

**Maximum permissible values of the input current and voltage**
Values of current and voltage assigned by the manufacturer which the transducer will withstand indefinitely without damage

**MCB**
Miniature Circuit Breaker

**MCCB**
Moulded Case Circuit Breaker

**Mean-sensing transducer**
A transducer which actually measures the mean (average) value of the input waveform but which is adjusted to give an output corresponding to the r.m.s. value of the input when that input is sinusoidal
Measurand
A quantity subjected to measurement

Measuring element
A unit or module of a transducer which converts the measurand, or part of the measurand, into a corresponding signal

Measuring range
That part of the span where the performance complies with the accuracy requirements

Measuring relay
An electrical relay intended to switch when its characteristic quantity, under specified conditions and with a specified accuracy attains its operating value

Metering (non-tariff)
Values computed depending on the values of digital or analogue inputs during variable periods

Metering (tariff)
Energy values computed from digital and/or analogue inputs during variable periods and dedicated to energy measurement for billing (tariff) purposes

Mid Point Sectioning Substation
A substation located at the electrical interface of two sections of electrified railway. It contains provision for the coupling of the sections electrically in the event of loss of supply to one section

Modbus
Proprietary communication protocol used on secondary networks between HMI, substation computers or Bay Computers and protective devices

MPSS
Mid Point Sectioning Substation (electrified railways)

Multi-element transducer
A transducer having two or more measuring elements. The signals from the individual elements are combined to produce an output signal corresponding to the measurand

Multi-section transducer
A transducer having two or more independent measuring circuits for one or more functions

Multi-shot reclosing
A reclosing scheme that permits more than one reclosing operation of a CB after a fault occurs before lock-out occurs

MV
Medium Voltage

N/C
Normally Closed

N/O
Normally Open

Nominal range of use
A specified range of values which it is intended that an influence quantity can assume without the output signal of the transducer changing by amounts in excess of those specified

Notching relay
A relay which switches in response to a specific number of applied impulses

NPS
Negative Phase Sequence

NS
Neutral Section (electrified railways)

Numerical relay
A protection relay which utilises a Digital Signal Processor to execute the protection algorithms in software

OCB
Oil Circuit Breaker

Off-Load Tap Changer
A tap changer that is not designed for operation while the transformer is supplying load

OHL
Overhead line

OLTC
On Load Tap Changer

On Load Tap Changer
A tap changer that can be operated while the transformer is supplying load.

Opening time
The time between energisation of a CB trip coil and the instant of contact parting

Operating current (of a relay)
The current at which a relay will pick up

Operating time (CB)
The time between energisation of a CB trip coil and arc extinction

Operating time (relay)
With a relay de-energised and in its initial condition, the time which elapses between the application of a characteristic quantity and the instant when the relay operates

Operating time characteristic
The curve depicting the relationship between different values of the characteristic quantity applied to a relay and the corresponding values of operating time

Operating value
The limiting value of the characteristic quantity at which the relay actually operates
OPGW
Optical Ground Wire – a ground wire that includes optical fibres to provide a communications link

OSI 7-layer model
The Open Systems Interconnection 7-layer model is a model developed by ISO for modelling of a communications network.

Output common mode interference voltage
An unwanted alternating voltage which exists between each of the output terminals and a reference point

Output current (of a transducer)
The current produced by the transducer which is an analogue function of the measurand

Output load
The total effective resistance of the circuits and apparatus connected externally across the output terminals

Output power (of a transducer)
The power available at the transducer output terminals

Output series mode interference voltage
An unwanted alternating voltage appearing in series between the output terminals and the load

Output signal
An analogue or digital representation of the measurand

Output span (span)
The algebraic difference between the lower and upper nominal values of the output signal

Overcurrent relay
A protection relay whose tripping decision is related to the degree by which the measured current exceeds a set value.

Overshoot time
The overshoot time is the difference between the operating time of the relay at a specified value of the input energising quantity and the maximum duration of the value of input energising quantity which, when suddenly reduced to a specific value below the operating level, is insufficient to cause operation.

Parametric conjunctive test
A conjunctive test that ascertains the range of values of each parameter for which the test meets specific performance requirements

PCB
Printed Circuit Board

PCC
Point of Common Coupling

PED
Power Electronic Device

Phase angle transducer
A transducer used for the measurement of the phase angle between two a.c. electrical quantities having the same frequency

Pick-up
A relay is said to 'pick-up' when it changes from the de-energised position to the energised position

Pilot channel
A means of interconnection between relaying points for the purpose of protection

PLC
Programmable Logic Controller. A specialised computer for implementing control sequences using software

PLCC
Power Line Carrier Communication

Point of Common Coupling
The interface between an in-plant network containing embedded generation and the utility distribution network to which the in-plant network is connected

POW
Point-on-Wave. Point-on-wave switching is the process to control moment of switching to minimise the effects (inrush currents, overvoltages)

Power Electronic Device
An electronic device (e.g. thyristor or IGBT) or assembly of such devices (e.g. inverter). Typically used in a power transmission system to provide smooth control of output of an item of plant

Power factor
The factor by which it is necessary to multiply the product of the voltage and current to obtain the active power

Power Line Carrier Communication
A mean of transmitting information over a power transmission line by using a carrier frequency superimposed on the normal power frequency.

PPS
Positive Phase Sequence

Protected zone
The portion of a power system protected by a given protection system or a part of that protection system

Protection equipment
The apparatus, including protection relays, transformers and ancillary equipment, for use in a protection system

Protection relay
A relay designed to initiate disconnection of a part of an electrical installation or to operate a warning signal, in the case of a fault or other abnormal condition in the installation. A protection relay may include more than one electrical element and accessories
**Protection scheme**
The co-ordinated arrangements for the protection of one or more elements of a power system. A protection scheme may comprise several protection systems

**Protection system**
A combination of protection equipment designed to secure, under predetermined conditions, usually abnormal, the disconnection of an element of a power system, or to give an alarm signal, or both

**Protocol**
A set of rules that define the method in which a function is carried out – commonly used in respect of communications links, where it defines the hardware and software features necessary for successful communication between devices.

**PSM**
Plug Setting Multiple – a term used in conjunction with electromechanical relays, denoting the ratio of the fault current to the current setting of the relay

**PSTN**
Public Switched Telephone Network

**PT100**
Platinum resistance temperature probe

**R**
Resistance

**R.M.S.-sensing transducer**
A transducer specifically designed to respond to the true r.m.s. value of the input and which is characterised by the manufacturer for use on a specified range of waveforms

**Ratio correction**
A feature of digital/numerical relays that enables compensation to be carried out for a CT or VT ratio that is not ideal

**Rating**
The nominal value of an energising quantity that appears in the designation of a relay. The nominal value usually corresponds to the CT and VT secondary ratings

**RCD**
Residual Current Device. A protection device which is actuated by the residual current

**RCP**
Remote Control Point. The Remote Control Point is a SCADA interface. Several RCP’s may be managed with different communication protocols. Physical connections are done at a Gateway or at substation computers or at a substation HMI

**Reactive power (var) transducer**
A transducer used for the measurement of reactive electrical power

**Reclaim time (auto-reclose)**
The time between a successful closing operation, measured from the time the auto-reclose relay closing contact makes until a further reclosing sequence is permitted in the event of a further fault occurring

**REF**
Restricted Earth Fault

**Reference conditions**
Conditions of use for a transducer prescribed for performance testing, or to ensure valid comparison of results of measurement

**Reference range**
A specified range of values of an influence quantity within which the transducer complies with the requirements concerning intrinsic errors

**Reference value**
A specified single value of an influence quantity at which the transducer complies with the requirements concerning intrinsic errors

**Relay**
See Protection relay

**Resetting value**
The limiting value of the characteristic quantity at which the relay returns to its initial position

**Residual current**
The algebraic sum, in a multi-phase system, of all the line currents

**Residual voltage**
The algebraic sum, in a multi-phase system, of all the line-to-earth voltages

**Response time**
The time from the instant of application of a specified change of the measurand until the output signal reaches and remains at its final steady value or within a specified band centred on this value

**Reversible output current**
An output current which reverses polarity in response to a change of sign or direction of the measurand

**Ripple content of the output**
With steady-state input conditions, the peak-to-peak value of the fluctuating component of the output

r.m.s.
Root Mean Square

**RMU**
Ring Main Unit

**ROCOF**
Rate Of Change Of Frequency (protection relay)

**RSVC**
Relocatable Static Var Compensator
RTD
Resistance Temperature Detector

RTOS
Real Time Operating System

RTU
Remote Terminal Unit. An IED used specifically for interfacing between a computer and other devices. Sometimes may include control/monitoring/storage functions

SAT
Site Acceptance Test. Validation procedures for equipment executed with the customer on site

SCADA
Supervisory Control and Data Acquisition

SCL
Substation Configuration Language. Normalised configuration language for substation modelling (as expected by IEC 61850-6)

SCS
Substation Control System

Setting
The limiting value of a ‘characteristic’ or ‘energising’ quantity at which the relay is designed to operate under specified conditions. Such values are usually marked on the relay and may be expressed as direct values, percentages of rated values, or multiples

SFC
Sequential Function Chart: One of the IEC 61131-3 programming languages

Short-term stability
The stability over a period of 24 hours

Simplex communications system
A communications system in which data can only travel in one direction

Single-shot reclosing
An auto-reclose sequence that provides only one reclosing operation, lock-out of the CB occurring if it subsequently trips

S.I.R.
System Impedance Ratio

Single element transducer
A transducer having one measuring element

SOE
Sequence Of Events

SOTF
Switch on to Fault (protection)

Specific conjunctive test
A conjunctive test using specific values of each of the parameters

Spring winding time
For spring-closed CB’s, the time for the spring to be fully charged after a closing operation

ST
Structured Text: One of the IEC 61131-3 programming languages

Stability (of a transducer)
The ability of a transducer to keep its performance characteristics unchanged during a specified time, all conditions remaining constant

Stability (of a protection system)
The quantity whereby a protection system remains inoperative under all conditions other than those for which it is specifically designed to operate

Stability limits (of a protection system)
The r.m.s. value of the symmetrical component of the through fault current up to which the protection system remains stable

Starting relay
A unit relay which responds to abnormal conditions and initiates the operation of other elements of the protection system

STATCOM
A particular type of Static Var Compensator, in which Power Electronic Devices such as GTO’s are used to generate the reactive power required, rather than capacitors and inductors

Static relay
An electrical relay in which the designed response is developed by electronic, magnetic, optical or other components without mechanical motion. Excludes relays using digital/numeric technology

Static Var Compensator
A device that supplies or consumes reactive power, comprised solely of static equipment. It is shunt-connected on transmission lines to provide reactive power compensation

STC
Short Time Current (rating of a CT)

Storage conditions
The conditions, defined by means of ranges of the influence quantities, such as temperature, or any special conditions, within which the transducer may be stored (non-operating) without damage

SVC
Static Var Compensator
**System disturbance time (auto-reclose)**
The time between fault inception and CB contacts making on successful re-closure.

**System impedance ratio**
The ratio of the power system source impedance to the impedance of the protected zone.

**T101**
Term used for IEC 60870-5-101 protocol.

**Tap changer**
A mechanism, usually fitted to the primary winding of a transformer, to alter the turns ratio of the transformer by small discrete amounts over a defined range.

**TCP/IP**
Transmission Control Protocol/Internet Protocol. A common protocol for the transmission of messages over the Internet.

**TCS**
Trip Circuit Supervision.

**TC57**
Technical Committee 57 working for the IEC and responsible for producing standards in the field of Protection (e.g. IEC 61850).

**TF**
a) Transfer Function of a device (usually an element of a control system)  
b) Transient Factor (of a CT)

**Through fault current**
The current flowing through a protected zone to a fault beyond that zone.

**Time delay**
A delay intentionally introduced into the operation of a relay system.

**Time delay relay**
A relay having an intentional delaying device.

**TPI**
Tap Position Indicator (for transformers).

**Transducer (electrical measuring transducer)**
A device that provides a d.c. output quantity having a definite relationship to the a.c. measurand.

**Transducer with offset zero (live zero)**
A transducer which gives a predetermined output other than zero when the measurand is zero.

**Transducer with suppressed zero**
A transducer whose output is zero when the measurand is less than a certain value.

**Unit electrical relay**
A single relay that can be used alone or in combinations with others.

**Unit protection**
A protection system that is designed to operate only for abnormal conditions within a clearly defined zone of the power system.

**Unrestricted protection**
A protection system which has no clearly defined zone of operation and which achieves selective operation only by time grading.

**UCA**
Utility Communications Architecture.

**UPS**
Uninterruptible Power Supply.

**UTC**
Universal Time Coordinates.

**V**
Voltage.

**VCB**
Vacuum Circuit Breaker.

**VDEW**
Term used for IEC 60870-5-103 protocol. The VDEW protocol is a subset of the IEC 60870-5-103 protocol.

**Vector group compensation**
A feature of digital and numerical relays that compensates for the phase angle shift that occurs in transformers (including VT’s) due to use of dissimilar winding connections – e.g. transformers connected delta/star.

**Voltage transducer**
A transducer used for the measurement of a.c. voltage.

**VT**
Voltage Transformer.

**X**
Reactance.

**Z**
Impedance.