Network Performance
Distribution System SCADA (DSS)
Capability Project

Project Note

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Term	Synonym(s)	Definition and References
ACR	Recloser	Automatic Circuit Recloser. A compact CB (often pole-mounted) having embedded automatic reclosing capability.
Adequacy		The ability of the network to meet demand within component ratings and voltage limits. Source: RAP Guidelines.
ALF		Analog Logging Facility. A specialised RDC used for feeding SCADA data to the viewing and logging subsystems.
Bandwidth		The capacity provided by a communication channel or used by a communicating application.
BPL		Broadband over PowerLine. A technology that utilizes power lines to transport data at broadband speeds.
CAIDI		Customer Average Interruption Duration Index. See also SAIDI and SAIFI. The group CAIDI contribution of an incident is calculated as sum(Customer Interruption Duration in Group) / (Number of Customers Affected in Group). CAIDI = SAIDI / SAIFI.
CB		Circuit Breaker. A switching device capable of making and breaking load current, and interrupting fault current.

Term	Synonym(s)	Definition and References
CBD		Central Business District (feeder category). Defined as feeders supplying predominantly commercial, high-rise buildings via a predominantly underground distribution network containing significant interconnection and redundancy when compared with urban areas.
CBMD		Communications Bearer Management Database. The system of record for the ENERGEX communications bearer network configuration.
CDB		Communications DataBase (SLECS DMS). The DMS database which contains (a) configuration data for the SCADA communications subsystem, and (b) real-time SCADA communications subsystem status.
CFI		Cable Fault Indicator (underground). A device which indicates the passage of fault current, indicating that a fault is located downstream of the CFI's location.
CIM		Common Information Model (generic term). ***The*** CIM is an information model for power systems and related secondary systems and computer applications. It is maintained (in part) by the CIM Users Group under the aegis of the UCA Users Group.
Concept of Operations	ConOps	A Concept of Operations (ConOps) is a user-oriented document that describes system characteristics for a proposed system from the users' viewpoint. The ConOps document is used to communicate overall quantitative and qualitative system characteristics to the user, buyer, developer, and other organisational elements (for example, training, facilities, staffing, and maintenance). It is used to describe the user organisation(s), mission(s), and organisational objectives from an integrated systems point of view. For more information, see IEEE Standard 1362-1998, IEEE Guide for Information Technology - System Definition - Concept of Operation Document.
Configuration (1) (electrical network)		The topology of an electrical network together with the open and closed states of switching devices.
Configuration (2) (system)		The hardware, software, firmware, ancillary data and documentation of a system.
Configuration management		The control (for quality assurance purposes) of changes, including the recording thereof, that are made to the configuration of a system.
DEM		Database Edit Manager. A subsystem for loading, validating and applying / rolling back changes to the DMS databases.
Disconnector	Isolator	A switching device which provides safety isolation.
DMS		Distribution Management System. A computer system used for monitoring, controlling and optimising the performance of an electricity distribution system.
DNP3		Distributed Network Protocol, version 3. An open SCADA communications protocol supported by the DNP User Group. Used for IED-SACS and DSS communications.
DNSP		Distribution Network Service Provider.
Downstream		Away from the source of supply.

Term	Synonym(s)	Definition and References
Dropout	DO, EDO	A HV fuse with a replaceable element which is enclosed in a tubular ablative carrier. The fuse element supplies structural rigidity to an over-centre mechanism such that when the element blows, the mechanism collapses under gravity to isolate the faulted circuit. Ablation of the carrier generates gases which expel the element and contribute to arc extinction (the E in EDO stands for Expulsion).
DSA	DA	Distribution System Automation. A vague term used by some to mean Distribution System SCADA (as distinct from Substation SCADA) and by others to mean highly automated, self-healing capability.
DSS		Distribution System SCADA. SCADA for widely dispersed network facilities such as switching devices, fault indicators and regulators.
ECS		Energy Control System (SLECS DMS). The DMS database which contains (a) configuration data for the SCADA data acquisition subsystem and (b) real-time SCADA data.
Enterprise Management System(s)		A system or systems for configuration management and monitoring of ICT infrastructure.
Failure Rate		The number of failures per unit time in a population of components of the same type.
Fast Tracking		The accelerated execution of a proven process to achieve the required outcomes quickly.
Fault		The unintended flow of electrical energy to due to insulation failure.
FI		Fault Indicator. See CFI and LFI.
GED		Graphical Editor. A tool for maintaining DMS world maps.
GPRS		General Packet Radio Service. Extension of GSM for data communications.
Ground Wire	Shield Wire	A wire (or wires) strung above the conductors of an overhead line to protect the line from lightning strikes.
GSM		Global System for Mobile communications. The dominant technology for public mobile communications in urban Australia. See also GPRS.
HV		High Voltage (11kV and above).
ICT		Information & Communication Technology
IEC 61850		A suite of standards covering communication networks for substation secondary systems (measurement, protection, interlocking, automation and SCADA).
IED		Intelligent Electronic Device. An electronic device having the following characteristics: (a) microprocessor-based, (b) multi-function and/or field configurable and/or field upgradeable, and (c) suitable for integration into a wider system via one or more communication ports.
IMP	BABI	Intelligent Mimic Panel. An ENERGEX proprietary graphical data browser for SCADA data. BABI (Build A Better IMP) is a new version of IMP based on open standards.
Interruption		The loss of service to one or more customers connected to the distribution portion of the system. Note: It is the result of one or more component outages, depending on system configuration. Source: IEEE 1366-2003.
IP		Internet Protocol. The network layer of the TCP/IP protocol suite, which is the common language of the Internet.

Term	Synonym(s)	Definition and References
ISDN		Integrated Services Digital Network. An international standard for an enhanced, circuit-switched “telephone” network based on digital technology. IDSN supports integrated voice, video and data services. Its strength lies in the ability to flexibly multiplex and aggregate channels.
Isolator		See disconnector.
LAN		Local Area Network. A computer network that spans a relatively small geographical area.
LBS		Load Break Switch. A switching device capable of making and breaking load current. May also serve as a disconnector.
LFI		Line Fault Indicator (overhead). A device which indicates the passage of fault current, indicating that a fault is located downstream of the LFI's location.
LGVT		Last Good Value Trapped. The most recent stable, non-zero value of an analogue SCADA point (for load currents, effectively the current before a fault interruption).
Long Rural		Feeder category. Defined as non-CBD, non-Urban feeders having a total feeder route length greater than 200km. See also Short Rural.
LV		Low Voltage (240/415V).
MAIFI		Momentary Average Interruption Frequency Index. The group MAIFI contribution of an incident is calculated as (Number of Customers Affected in Group) / (Total Customers in Group), where the incident is an outage of less than one minute's duration.
Mature		Complete in the developmental sense. The term must be used carefully: A material may be mature but its application in a new field may not.
MCP		MicroSACS Communication Protocols. An ENERGEX proprietary SCADA communications protocol suite used for DSS communications.
MDI		Maximum Demand Indication. The maximum averaged value of an analogue SCADA point in a defined period. SACS provides four 15-minute-average MDIs for each analogue SCADA point – today, yesterday, last week, and since last reset.
MDO		Master dropout. A dropout fuse used to protect a feeder spur - thereby improving the reliability of the backbone.
Microcontroller	MicroSACS	An ENERGEX proprietary IED, which was produced in two “flavours” – Poletop Microcontroller for DSS, and CB Microcontroller for Substation SCADA.
MOPs		Message Operations. DMS services for accessing the “messaging” capabilities of RDCCOM (typically used for setting and querying SACS application parameters).
NetCore		Network – Configuration Of Remote Equipment. The system of record for the ENERGEX SCADA system configuration.
Network Performance		The performance of the network business, and especially of the network itself
NFM		Network Facilities Management. The system of record for ENERGEX network assets.
OPGW		OPtical Ground Wire. A ground wire containing embedded optical fibres for communications.

Term	Synonym(s)	Definition and References
Outage		The state of a component when it is not available to perform its intended function due to some event. An outage may or may not cause an interruption of service to customers, depending on system configuration. Source: IEEE 1366-2003.
PDB		Power DataBase (SLECS DMS). The DMS database which contains (a) configuration data for the power system applications (including the network model), and (b) real-time results from the power system applications.
Performance		A single, aggregate or composite characteristic of an organisation, system or component, typically used for comparative evaluation.
PLC		Programmable Logic Controller. An electronic device capable of executing user-specified combinatorial and sequential logic functions. Physical input and output interfaces can be configured for a wide range of applications. Commonly used in industrial process control systems. Can be self-contained or modular. Mid-range and high-end PLCs can be networked with other PLCs and user interface devices.
PMR		Pole-Mounted Recloser. See ACR.
Point		In the SCADA world, separate items of data are called points. Points can be accompanied by ancillary data such as the date/time of acquisition and quality codes (in IT parlance, a point is therefore a *record*, not a single value). Each point has a unique address (or *key*), usually a two-part address comprising a globally unique RTU address followed by a locally unique database address within the RTU.
Protocol (communication)		A set of rules for communications interoperability. Protocols are typically implemented in "layers" where each layer addresses a distinct set of concerns, eg. physical (electrical or optical) interconnection, media access, data link control, networking, reliable end-to-end transport, session control, data presentation, and application functions.
PSTN		Public Switched Telephone Network. The telephone network which provides POTS (Plain Old Telephone Service) to the general populace.
RAP		Reliability Assessment Planning. A planning methodology which balances the cost of load a risk against the cost of risk mitigation.
RDC		Remote Data Concentrator. A computer used for data marshalling and protocol translation in a SCADA system. Typically located so as to minimise the cost and maximise the performance of SCADA communications links. May support ancillary functions and power system applications.
RDCCOM		RDC COMmunication protocol. An ENERGEX proprietary SCADA communications protocol used for SACS-RDC and RDC-DMS communications.
Recloser		See ACR.
Redundancy		The duplication of components in a system with a view to improving system security.
Reliability (network)		(1) A measure of network performance relating to interruptions. IEEE 1366 defines a host of reliability indices. This glossary contains the definitions for CAIDI, MAIFI, SAIDI and SAIFI. Source: IEEE 1366-2003. (2) A general term covering the adequacy and security of supply over time. Source: RAP Guidelines.

Term	Synonym(s)	Definition and References
RTU		Remote Terminal Unit. A device or system which interfaces objects in the physical world to a SCADA system.
SACS		Substation Automatic Control System. An ENERGEX proprietary SCADA RTU / application platform based on open standards.
SAIDI		System Average Interruption Duration Index. See also CAIDI and SAIFI. The group SAIDI contribution of an incident is calculated as sum(Customer Interruption Duration in Group) / (Number of Customers in Group). SAIDI = CAIDI x SAIFI.
SAIFI		System Average Interruption Frequency Index. See also CAIDI and SAIDI. The group SAIFI contribution of an incident is calculated as (Number of Customers Affected in Group) / (Number of Customers in Group). SAIFI = SAIDI / CAIDI.
SCADA		Supervisory Control And Data Acquisition. Remote monitoring and control of network facilities.
Scheme		A collection of network components (eg. adjacent feeders and the associated switching devices, fault indicators and regulators) likely to be collectively involved in DSS / DSA operations.
Sectionaliser		A switching device (typically a LBS) having embedded automatic sectionalising capability. May also serve as a disconnector.
Security (1)		The ability of a system to cope with perturbing events such as component failures without uncontrolled loss of load. Source: RAP Guidelines.
Security (2)	Information Security	Protection of the confidentiality, integrity and availability of information.
Short Rural	Rural	Feeder category. Defined as non-CBD, non-Urban feeders having a total feeder route length less than 200km. See also Long Rural.
SICM		Serial Interface Control Module. An ENERGEX proprietary IED, typically used as a distributed data acquisition and control module in SACS systems.
SLECS		SNC Lavalin Energy Control Systems. The manufacturer of ENERGEX's DMS.
Step Voltage Regulator	Regulator	A compact autotransformer (generally pole mounted) having an on-load tapchanger and embedded automatic voltage regulating capability. ENERGEX generally applies single phase step voltage regulators in pairs for three-phase voltage regulation by adjustment of two phase-phase voltages.
Substation SCADA		SCADA for substation facilities.
Switching device	Switch	A CB, ACR, sectionaliser, LBS or disconnector.
TCO		Total Cost of Ownership. The cost of owning, operating and maintaining a component or system. TCO includes the up-front costs of equipment and licences, plus the costs of installation, training, support, upgrades and repairs.
TCP		Transmission Control Protocol. The reliable end-to-end transport layer of the TCP/IP protocol suite, which is the common language of the Internet. TCP is "layered" on top of IP.
Topological space		A structure that allows one to formalize concepts such as connectedness and continuity.
Topology (1)		The branch of mathematics that studies topological spaces.

Term	Synonym(s)	Definition and References
Topology (2) (logical)		A pattern which orders the arrangement of nodes and branches in a network, eg. ring, star.
Topology (3) (physical)		The arrangement of nodes and branches in a network. See also Configuration (electrical network).
UCA		Utility Communications Architecture. A set of standards for communications and interoperability between power system secondary systems and computer applications. Initially developed by EPRI, the UCA has since been divested to IEC TC57 for ongoing development. User input into the UCA is managed (in part) by the UCA International Users Group. Key focus areas of the UCA include the CIM and the IEC 61xxx suite of standards.
Upstream		Toward the source of supply.
Urban		Feeder category. Defined as non-CBD feeders having a maximum demand greater than 300kV.A per kilometre of total feeder route length. See also Rural.
UtiliNet		UtiliNet is a proprietary technology which uses spread spectrum radios operating in the unlicensed 900 MHz band to provide wireless networking for SCADA applications.
WAN		Wide Area Network. A computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more interconnected LANs.
W-CDMA		Wideband Code Division Multiple Access. The emerging technology of choice for public mobile communications in Australia.
WiFi	IEEE 802.11x (802.11a, 802.11b, 802.11g)	A suite of International Standards for wireless local area networks.
World Map	Picture	A graphical display on which ECS, PDB and static data may be displayed in any useful combination.
ZigBee		ZigBee is a specification for a suite of high level communication protocols designed to use small, low power digital radios based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs) operating in the unlicensed 900MHz band. ZigBee's current focus is to define a general-purpose, inexpensive, self-organizing mesh network that can be can be used for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation, home automation, etc.