

Defined operating and maintenance terms and abbreviations

TRANSPOWER APPROVED STANDARD

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PREFACE

Following feedback, on issue 8, the following minor changes have occurred in *issue 9*.

Clause 4.2:

Changed "Project Controller" to "Project Manager"
"ready for livening" placed in alphabetical order

Clause 5.2:

Deleted LTRAX added LTS

The following changes have occurred in *issue 8*:

Clause 4.2:

Note 2 EGR replaced with the (Code) i.e. the "Electricity Industry Participation Code"
Changed "field switcher" to "maintenance switcher"
Changed "accept" to "received"
Added "actioner"
Added "Annual Outage Plan"
Changed "commissioning co-ordinator" to "commissioning controller" and,
"contract manager/supervisor" to "project contractor"
Added "field operator"
Added "Distance to Fault"
Added "Manual Operating Log"
Added "Market Data Entry (MDE)"
Added "MOS Notes"
Added "Network risk register"
Added "Next day (RCB)"
Added "Operating Sequence Controller"
Added "Operational request"
Added "Outage Plan"
Added "Plant Request"
Added "Project Controller"
Added "Project Engineer"
Added "ready for livening"
Changed Regional Operator definition to "A Transpower employee"
Changed Regional Planner definition to "A Transpower employee"
Added "SCADA Outage scheduler"
Added "Security management plan"
Added "Short time planning"

Clause 5.1:

Deleted "COF Confirmation of Offer"
Deleted "DIS disable"
Deleted "ENA enable"
Added "DTF distance to fault"
Added "RFLN Ready For Livening Notice"
Added "ATC automatic tap changer control"
Added "HSB Hot Standby"
Added "SWO Switched Out"
Added "GOR Grid Operating Report"
Added "MER Major Event Report"
Added "STC Static synchronous compensator"

Clause 5.2:

Added "(Code) Electricity Industry Participation Code"
Deleted EGR
Added "ECC and ECN Emergency operating centre Central/North"
Deleted LTRAX added LT2005
Added "MOL - Manuel Operating Log"
Added "MOS - Market Outage Scheduler"
Deleted "SFIR"
Added "SOS - SCADA Outage Scheduler"

Appendix A - Guide to requirements for contractor's systems:

Deleted

Appendix B (now Appendix A):

Deleted EGR and added Code

Keywords

abbreviations defined definitions terms

CONTACT

This document is the responsibility of Grid Performance, Service Operations Group, Transpower New Zealand Limited, Wellington. If you have any queries please contact the Service Operations Manager. If you would like to make suggestions to improve this standard, please use the "Controlled Document Feedback Form" located on the Controlled Document homepage of the Transpower website.

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MINIMUM REQUIREMENTS

The requirements set out in Transpower's standards are minimum requirements that must be complied with by contractors, including designers and other consultants. The contractor is expected to implement any practices which may not be stated but which can reasonably be regarded as good practices relevant to the purpose of this standard. Transpower expects contractors to improve upon these minimum requirements where possible and to integrate these improvements into their procedures and quality assurance plans.

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1. PURPOSE

To define the meaning of terms and list the abbreviations used in power system operation and maintenance verbal and written communications.

2. POLICY REQUIREMENTS

Safe, secure and efficient provision of operating and maintenance services by all parties involved with the operation and maintenance of the power system through the consistent use of the relevant terms and abbreviations and a clear understanding of their meaning as defined in this Standard.

3. REFERENCES

(Refer to Appendix B).

4. TERMS AND DEFINITIONS

4.1 General

- (a) Only those defined terms and abbreviations that are used in approved Transpower Standards and Service Specifications are included in this document.
- (b) The writers and reviewers of Standards and Service Specifications must:
 - (i) use the terms and definitions and abbreviations as published here, or
 - (ii) if new defined terms and abbreviations need to be created use the approved change process to ensure the new terms and abbreviations are included in this document.
- (c) Each time a Standard or Service Specification is reviewed, a check of all defined terms and abbreviations must be made to ensure that they have the meaning defined in this document.
- (d) New terms and abbreviations will be added to this Standard on the day approved Standards or Service Specifications are issued or reissued.
- (e) All defined terms and abbreviations used in Standards and Service Specifications must be bolded.

4.2 Defined terms

Notes:

1. Definitions for terms followed by "(SM-EI)" are taken directly from the current "*Safety Manual - Electricity Industry*".
2. Definitions for terms followed by "(Code)" are taken directly from the current "*Electricity Industry Participation Code*".
3. Defined terms, abbreviations and references listed in this Standard are bolded.

Term	Definition
access permit (SM-EI):	The permit for access to, and work on or within the relevant minimum approach distance of, equipment that has been isolated for work other than testing under a test permit . Under an access permit , the recipient and their work party have temporary access for work activities to specific isolated equipment , which is in a defined state (relevant minimum approach distance is that which would apply if the equipment were live).
actioner:	The person who checks, then actions, an operating sequence. This includes the Operating Sequence Controller and any Field Operator.

affected designated transmission customer:	A designated transmission customer who has assets physically connected to the assets which are the subject of a planned outage or an unplanned outage .
annual outage plan:	Compilation of windows for routine maintenance and planned projects for the next financial year ahead from 1 st of July to the 30 th of June
approved (SM-EI):	Having an asset owner's or employer's endorsement for a specified function or purpose. <i>Notes:</i> <ol style="list-style-type: none"> 1. When related to equipment such as portable earths, it shall be of suitable rating and design for the conditions of use, proven by test, and of a type either provided by the asset owner or employer and/or endorsed for use by the electricity industry or any industry sector. 2. In Note 1 the word "equipment" is used with its usual meaning.
arc through:	An HVDC mercury arc fault where a valve conducts in the forward direction when it shouldn't. Effects range from insignificant to severe; the most severe is an inverter bypass valve arc through. Fault cleared by control action.
arcback:	A transient HVDC mercury arc valve fault caused when a valve fails to withstand the reverse voltage step, resulting in a transient reverse current flow in the valve. It causes a transient two-phase a.c. short circuit, cleared by control action.
assurance (SM-EI):	A statement made by the employee controlling equipment isolation points to the issuer of an access or test permit that: <ol style="list-style-type: none"> (a) Safety measures have been applied as specified; and (b) Those safety measures will remain in place until the issuer instructs otherwise. <i>Note: Where practicable the statement shall be in writing.</i>
asset owner (Code):	Means a participant who owns assets used for the generation or conveyance of electricity and persons who operate such assets and, in the case of part C, includes consumers with a point of connection to the grid.
automatic under frequency load disconnecting (Code):	Disconnecting demand by devices detecting grid system frequency below a pre-set value and initiating automatic disconnection of network feeders .
auto-reclose:	The automatic reclosure of a circuit breaker after a predetermined time following a fault tripping.
available for service:	A declaration made by the Regional operator to the Security Coordinator that defined grid system equipment is available for service .

black start (Code):	Means an ancillary service required to enable a generating unit isolated from a grid to be livened and connected to the grid.
blind spot:	The conductors between a CB and the associated CT which may not be effectively protected unless dedicated Blind Spot Protection is installed.
bus (busbar):	A low impedance conductor to which several other conductors can be separately connected.
bus section disconnecter:	A disconnecter in series between two bus sections.
circuit breaker lock-out:	The status of a CB deliberately prevented from operating due to the action of a monitoring or protection device.
commissioned:	The operational state of equipment which has undergone the commissioning process and is brought under the normal operational control of a Regional operator .
commissioning:	The process of bringing new or reinstalled equipment into normal power system operation .
commissioning controller:	The person appointed by the designated project contractor who co-ordinates the real time on site commissioning activities.
commissioning plan:	A document that is used to plan and control the process of connecting uncommissioned equipment to, or withdrawing equipment from, the power system.
commutation failure:	An HVDC inverter fault (mercury arc or thyristor) usually initiated by an a.c. disturbance, where current fails to transfer from one valve to the next ("commutation"). This causes a transient d.c. short circuit, cleared by control action.
compensate:	Operation of a synchronous condenser or generating set as a synchronous condenser.
competency certificate:	A certificate endorsed by an employer that defines functions an employee is competent to undertake.
competent (SM-EI):	An employee is competent when they can demonstrate to their employer, at any time, that they have the necessary knowledge, skills and experience to carry out the work safely and to the standards used by the employer. Notes: 1. <i>The standard that the employer uses for assessing competence shall comply with regulatory requirements and shall, as a minimum, be an industry standard where such a standard is available. However, for issuer and recipient competence, the asset owner will set the standard or will recognise an</i>

- industry standard or the employer's own standard.*
2. *Where qualifications are a legal pre-requisite for determining competence, such qualifications will be included in the standard.*
 3. *Competence shall be regularly assessed so that the employer can be confident that competence is being maintained.*
 4. *Competence for significant activities or roles is recorded in Documentation of Competence. A **competent employee** may need to also hold other documentation, e.g. a licence or a certificate of competence under appropriate regulations.*

compiler:	The person who plans, compiles, checks and approves the operating sequence on an operating form .
compliance:	Means ensuring that the requirements of legislation are met by Transpower.
conductor (SM-EI):	Bare conductor or conductor not insulated to full working voltage (unless the context conveys another meaning). Conductor includes conductive parts.
connection assets:	Any grid asset at a connection node other than voltage support equipment that is for grid voltage support purpose and has not been installed at a customer's request.
connected party (Code):	Any person who has assets physically connected to the grid assets .
consequential arcbck:	With one valve experiencing an arcbck, the second normally conducting valve also has an arcbck. It causes a two phase a.c short circuit which is cleared by circuit breaker tripping.
constraint (Code):	Means a limitation in the capacity of the grid to convey electricity caused by limitations in capability of available assets forming the grid; or limitations in the performance of the integrated power system.
contingent event (Code):	Clause 12.3, Chapter 1 Policy Statement, describes " contingent events " as the following: Contingent events: Events where the impact, probability of occurrence and estimated cost and benefits of mitigation are considered to justify implementing policies that are intended to be incorporated into the scheduling and dispatch processes pre-event. Examples are set out in Clause 12.4 of Chapter 1 of the Code .
continuous signal receive:	In distance protection schemes a signal-receive operating continuously to provide minimum time tripping for faults.

control equipment:	Equipment used directly for control of primary system equipment e.g. automatic voltage regulators and temperature monitors used on power transformers.
control room (Code):	Means the location at which asset owners have facilities to accept operational instructions from the system operator and to act on those instructions.
controlled area:	A fenced area around station buildings for which entry is possible only via a magnetic swipe card, key or remote controlled gate.
controller:	The person, located at a control room , who has the (dispatch customer's) authority to exercise normal operational control of power system equipment in real time.
dead band:	A characteristic of an automatic control system, e.g. governor or voltage regulator, within which a change of value of an input signal may take place without causing a perceptible change in output signal. Sometimes referred to as dead zone.
decommissioned:	Equipment permanently disconnected from the power system.
de-energised (Electrical) (SM-EI):	Not connected to any source of electrical supply but not necessarily at zero voltage, e.g. may have an induced voltage.
demand (Code):	A measure of the rate of consumption of electrical energy.
disable:	Prevent the functioning, e.g. of a protection and/or control system.
discharged (electrical):	Short circuited and/or connected to earth in such a manner as to ensure an effective dissipation of stored electrical energy.
disconnecter:	A switch that, when in the open position, provides isolation in accordance with specified requirements.
dispatch (Code):	Means the process of: <ul style="list-style-type: none"> (a) pre-dispatch scheduling to match expected supply with expected demand, and to allocate ancillary service offers and transmission offers to match expected grid conditions; and (b) rescheduling to meet forecast demand; and (c) issuing instructions based on the pre-dispatch schedule and the real time conditions to manage resources to meet the actual demand.
dispatch customer	Any person who receives dispatch services from the system operator , or who may affect those services, and includes any person who is one or more of an ancillary

	service provider, an asset owner, a direct consumer, an energy injection customer, an energy off-take customer, a generator , the grid asset owner or a network manager.
dispatch instructions (Code):	An instruction formulated and issued by the system operator in accordance with clause 13.72 of Sub part 2 of Part 13 of the Code .
distance to fault	Line impedance % value used in nomogram calculation to determine the most probable fault location giving the closest towers on a faulted circuit.
disturbance recorder:	A device that continuously monitors electrical analogue and/ or digital information. In the event of a disturbance this information is recorded/ stored and available for subsequent analysis.
documentation of competence (SM-EI):	<p>Documentation which:</p> <ul style="list-style-type: none"> (a) Has a personal identifier, e.g. name, address, preferably a photograph; (b) Records the specified roles for which the employee is deemed competent. <p>The documentation shall:</p> <ul style="list-style-type: none"> (i) describe the competence levels achieved by the employee (ii) define any limits on the type of work that can be carried out by the employee and/or the place in which it may be done (iii) contain for each competence, the date of the last assessment and the date of the next assessment. <p><i>Notes:</i></p> <ul style="list-style-type: none"> 1. <i>The documentation may relate to a specific competence, e.g. working unsupervised in a restricted area, or for several types of competence.</i> 2. <i>The documentation is normally issued to the employee by the employer.</i>
drop load test:	A test involving the sudden removal of load from a generator to measure speed rise and to test the operation of overspeed and other protective devices.
dropper:	A short length of conductor making a connection between a HV bus (or other item of equipment) and an item of equipment situated below that bus etc.
earth fault factor (Code): IEC 50 (604-03-06)	At a given location of a three-phase system, and for a given system configuration, the ratio of the highest r.m.s. phase-to-earth power frequency voltage on a healthy phase during a fault to earth affecting one or more phases at any point on the system to the r.m.s. value of phase-to-earth power frequency voltage which would be obtained at the given location in the absence of any such fault.

earthed (SM-EI):	Effectively connected to the general mass of earth.
earthing device (SM-EI):	An approved device for temporarily earthing isolated equipment for work access. <i>Note: Such devices include earth switches, earthing trucks and approved portable earths.</i>
earths:	A generic term for the apparatus used for earthing.
embedded assets:	Any equipment and plant which is physically connected to a network and which is: <ul style="list-style-type: none"> (a) Capable of generating: <ul style="list-style-type: none"> (i) greater than five MW of electricity; or (ii) equal to or less than five MW and which in the reasonable opinion of the system operator, may affect the security, power quality or operation of the grid system and the system operator has given notice to the relevant network manager accordingly; or (b) Capable of consuming an amount of electricity which, in the reasonable opinion of the system operator, may affect the security, power quality or operation of the grid system and the system operator has given notice to the relevant network manager accordingly.
employee (SM-EI):	Any person who is required to work in accordance with SM-EI regardless of for whom the person works.
enable:	Restore the functioning: e.g. of a protection and/ or control system, after that system has been disabled .
energised (SM-EI):	Electrically livened , or connected to or containing some other source of energy, e.g. steam, compressed air, hydraulic energy, etc.
energy co-ordinator:	The Transpower employee who manages the dispatch processes at the generator/ transmission grid interface .
ensure (SM-EI):	In the context of access and test permits means: <ul style="list-style-type: none"> (a) To be accountable for the requirement being carried out; (b) To carry out the requirement personally or have it carried out by another person.
equipment (Code):	Means any of: <ul style="list-style-type: none"> (a) assets or a network physically connected to the grid; (b) assets or a network forming part of the grid; (c) assets or a network not physically connected to the grid but which, in the reasonable opinion of Transpower, can affect the management, security, operation or performance characteristics of the grid; or

- (d) other **equipment** not physically connected to the grid but which, in the reasonable opinion of Transpower, can affect the security or **operation** of the grid, or power quality.

equipment (SM-EI):

Apparatus, transmission/ distribution lines, cables, and circuits or plant (electrical, mechanical, civil) that can be **removed from service** and which, when it is **removed from service**, if **energised** or put back into service inadvertently, could be a hazard to **employees** and other persons.

Notes:

1. *Such **equipment** is typically fixed in location, and used for the generation, transmission and distribution of electricity.*
2. *Instead of this defined meaning, the term "**equipment**" is also used in a few places in these rules with its usual general meaning, e.g. personal protective **equipment**. Such **equipment** is typically personal protective **equipment**, mobile or portable **equipment** and is used for maintenance or construction. Where the term is used with its usual general meaning, this is noted unless the meaning is obvious.*

feeder:

A circuit which provides a direct connection to a customer.

field outage planner:

A Transpower **employee** who liaises with connected parties on maintenance and **commissioning** activities and obtains their agreement for the proposed work **outages**.

field operator:

Actions **operating sequences** under the instruction of the **Operating sequence Controller**.

forced outage (emergency and standby power systems):

A power **outage** that results from the failure of a system component, requiring that it be taken out of service immediately either automatically or by manual switching operations, or an **outage** caused by improper **operation** of **equipment** or human error. This type of power **outage** is not directly controllable and is usually unexpected.

gas flooding area:

Any area, space or enclosure subject to deliberate flooding by a non flammable gas, e.g. machine enclosures, switch rooms, etc.

gas free (SM-EI):

A condition where the gas concentration in air is below the gas free limit.

gas free limit (SM-EI):

The lower of the published threshold limit value for the gas in air, or 25 % of the lower explosive limit of the gas in air.

gas hazard area (SM-EI):

The defined area or location in which leakage of a flammable gas or gas mixture into the air may cause the concentration in air of the gas or gas mixture to exceed

	the gas free limit.
generating set:	A single rotating machine transforming mechanical or thermal energy into electricity.
generator (Code):	Means a person who owns generating units connected to a network , or any person who acts, in respect of part G, part H and part J, on behalf of any person who owns such generating units, and includes embedded generators , intermittent generators and co- generators .
good industry practice (Code):	In relation to transmission, means the exercise of that degree of skill, diligence, prudence, foresight and economic management, as determined by reference to good international practice, which would reasonably be expected from a skilled and experienced asset owner engaged in the management of a transmission network under conditions comparable to those applicable to the grid consistent with applicable law, safety and environmental protection. The determination is to take into account factors such as the relative size, duty, age and technological status of the relevant transmission network and the applicable law.
grid asset owner (Code):	Transpower New Zealand Limited.
grid assets (Code):	Means assets and other works (including land and buildings) owned or operated by Transpower, which form part of the grid or are required to support the grid.
grid emergency (Code):	Means a situation where: <ul style="list-style-type: none"> (a) in the reasonable opinion of the system operator, one or more of the events set out in clause 5(1) of technical code B of schedule 8.3 of part 8 has occurred, or is reasonably expected to occur and urgent action is required of the system operator or participants to alleviate the situation; or (b) independent action (as set out in clause 9(2) of technical code B of schedule 8.3 of part 8) is required of a participant to alleviate the situation.
grid emergency notice (Code):	A notice issued by the system operator in accordance with technical code B of Schedule 8.3 of Part 8 of the Code .
grid exit point:	A point of connection where electricity may flow out of the grid.
grid interface (c):	Means the assets used to make a connection to the grid (as the case may be), including associated protection, control and communication systems. The term includes the interface between assets forming part of the grid.
grid system	That part of the New Zealand electric power system which electrically interconnects any or all points of

	service.
high voltage (HV) (SM-EI):	Any voltage exceeding 1000 V a.c. or 1500 V d.c.
hot work (SM-EI):	Any activity liable to produce a spark, hot metal or a naked flame. Activities designated as hot work include grinding, gas cutting, welding, drilling, use of a heat gun and any other activity which could provide an ignition source.
HV metalclad switchgear:	High voltage switchgear in which the circuit breaker, feeder connection, busbar connection and ancillary items are located in separate metal-partitioned compartments. The compartments incorporate air or compound, or SF ₆ gas insulation that may provide phase segregation.
incomer:	A circuit breaker that connects a transformer to a supply bus (usually the LV CB).
induction (electrical):	The phenomenon causing voltage to be present in a conductor (line, bus, etc.) due to the influence of an adjacent energised conductor . Induction can produce very high voltages . This includes both electro-magnetic and electro-static effects.
industry procedures (SM-EI):	Procedures that are recognised by the electricity industry generally, or by a particular sector of the industry, including contractors working for the industry, as being the recommended method of achieving the required outcome in a way that avoids harm to any employee(s) and to other persons.
interconnection assets:	Any grid asset that is not a connection asset, or an HVDC asset.
interested participant:	A participant that has given Transpower notice pursuant to clause 3.2.3 of Part F of the Code that it wishes to be consulted in respect of a planned outage of specified interconnection assets .
interruptible demand:	Demand which, by agreement between the system operator and an ancillary service provider, may be disconnected without prior warning for the purposes of security of the grid system .
intertrip:	A signalling system whereby a signal initiated at one station trips a CB at another station .
islanded operation:	The condition when a section of the power system is disconnected from and operating independently of the remainder of the power system.
isolate (verb):	To deliberately disconnect equipment . Examples of this are: (a) Opening of a disconnecter ;

	(b) Removal of VT secondary fuses.
isolated (SM-EI):	Deliberately disconnected from external sources of harm, e.g. energy (electrical or mechanical) or asphyxiating, toxic or flammable gas, and rendered incapable of being reconnected without predetermined deliberate action. <ol style="list-style-type: none"> 1. Isolation can be achieved by opening disconnectors, closing valves or similar actions. 2. Where practicable, points of isolation shall be tagged in the isolated position. 3. Despite equipment being isolated, it may still contain hazards, e.g. induced voltage, LV supplies, stored energy, toxic gas.
issuer (SM-EI):	A competent employee , who issues, modifies, receives back, transfers, or cancels access and test permits . <i>Note: The competence needs to be documented; refer to the definition Documentation of Competence.</i>
joint control:	Control and automatic load sharing of generators and HVDC poles on a group basis.
jumper (connection):	A length of conductor connecting adjacent spans of a transmission circuit conductor , or switchyard bus or equipment .
live (SM-EI):	Connected to a source of electrical supply or subject to hazardous induced or capacitive voltage.
live work:	Work performed on or near normally energised conductors , without using isolating and earthing procedures during the work, and at distances closer than the minimum approach distances specified in SM-EI Rule 3.703.
local control:	Control of an operation at a point on, or adjacent to, the controlled device.
local service:	Local a.c. supply providing power for station auxiliary services.
lock off:	To prevent operation by means of a lock.
lock-out box:	A lockable facility for holding keys, fuses, etc.
log (the) (SM-EI):	The collection of log books , log sheets, completed access and test permit forms and other records, including electronic and tape, that together form a complete record of operating events in a station or operating area.
log book:	A book designated for entering a handwritten statement of power system equipment operational events.
logged (SM-EI):	Recorded in the log .

loss of communication (Code):	A sustained disruption of communications between the system operator and the control rooms of one or more dispatch customers, such that operation of the grid system is affected or is likely to be affected.
loss of connection:	Transpower initiated event that results in a loss of electrical supply to a connected party .
low voltage (LV) (SM-EI):	Any voltage exceeding 50 V a.c. or 120 V ripple free d.c. but not exceeding 1000 V a.c. or 1500 V d.c.
Manual Operational Log (MOL):	Electronic logging tool used by the regional operators and system co-ordinators for manually logging operating and other events related to the operation of the power system
maintenance switcher:	A competent contractor employee who is certificated and authorised to recieve operational control of defined power system equipment from a controller (or other maintenance switcher) and actions those operating tasks necessary for gaining safe and secure work activity access.
maintenance switching time:	The time, before and after work time, required to make equipment under the operational control of the maintenance switcher ready for: <ul style="list-style-type: none"> (a) Work access, and; (b) Return to an available for service state.
Market Data Entry (MDE):	Tool to indicate to the wholesale energy market the security and pricing impact of outages
maximum voltage limit:	That voltage level, above the nominal voltage at the point of service, at which dispatch customers and connected parties are required to take independent corrective action to minimise the risk of damage to equipment . The limits are set out in the table contained in Rule 3.1.1 of Section III of Part C of the Code .
minimum approach distances (SM-EI):	The minimum distances when approaching live conductors that shall apply to employees , including conductive material carried by them, vehicles, and mobile plant.
minimum voltage limit (Code):	When any grid voltage reaches the minimum voltage limit set out in the table contained in clause 8.22 (1) subpart 2 of Part 8 and is sustained at or below that limit, the system operator may require the disconnection of demand in accordance with rule 8.24 in appropriate block sizes until the voltage is restored to above the minimum voltage limit.
mobile plant (SM-EI):	Cranes, elevating work platforms, tip trucks or similar plant, any equipment fitted with a jib or boom and any device capable of raising or lowering a load.

MOS Notes:	Electronic tool used by the system operator to detail security implications, required actions and other information needed for managing grid outages , including IT systems.
multilock box:	Lock-out box used in a multilocking system.
multilocking system:	A system of locks associated with locking off safety measures .
network (Code):	Means the grid, a local network or an embedded network .
network risk register:	A register of the system deficiencies, or situations where system security can not be maintained, and requires further investigation to determine if further grid or network investment is required
next day:	For the purpose of the RCB process, the next day is as the period following the current business day up to and including the next business day.
notified planned outages (Code):	Means those planned outages of assets forming part of or connected to the grid or local network which have been planned by the asset owners concerned and have been notified to the system operator in accordance with technical code D of schedule 8.3 of part.
open (verb):	Electrical: to operate a switch, CB, disconnecter etc. to prevent the flow of an electric current. Mechanical: to operate a gate or valve to permit the passage of a substance.
operating form:	A form used for listing an operating sequence or single action.
operating sequence:	A planned sequence of operating actions (or a single action) compiled on a designated form.
operating sequence controller:	The person who holds operational control and thus has authority and responsibility for controlling the actioning of an operating sequence . The Operating sequence Controller will also be an actioner (e.g. Regional operator , Maintenance switcher or Connected party Controller).
operating time:	The time required for the removal from/ preparing for the return to service of power system equipment .
operation (of the grid system):	The real time co-ordination of the conveyance of electricity across the grid system , and operate the grid system is to be interpreted accordingly.
operational control (of	The exercising of authority, whether direct or delegated,

equipment)	to control equipment .
operational request:	A request for gaining work activity access to power system equipment or where work activities will or can impact on the security, reliability and/or operation of the power system.
outage (Code):	<p>When interconnection assets or connection assets are temporarily not provided in accordance with the requirements of a transmission agreement or the requirements of section VI. Without limiting the above, and the outage includes a situation where:</p> <ul style="list-style-type: none"> (a) Transpower removes assets from service temporarily; (b) Assets are not able to be provided due to grid emergencies, in order to deal with health and safety issues, or due to circumstances beyond Transpower's reasonable control; (c) Transpower reduces the capacity of branches below the capacity required by a transmission agreement or rule 3 of section VI; (d) Transpower changes the configuration of the grid.
outage co-ordination (Code):	<p>The actions of the system operator undertaken, in accordance with technical Code A of Schedule 8.3 of Part 8 of the Code, to co-ordinate notified planned outages of equipment forming part of, or connected to the grid system and the actions of the asset owners undertaken in accordance with technical Code D of Schedule 8.3 of Part 8 of the Code, to co-ordinate planned outages of equipment.</p> <p><i>Note: The equipment may consist of, or include, secondary equipment or substations required for control, protection, communications, etc.</i></p>
outage plan:	An overall programme for outage windows of power system equipment . It is a living document and under continual review.
outage plan (Code):	The annual outage plan prepared under the outage protocol .
outage protocol (Code):	<p>Prepared in accordance with section VII of Part F specifying:</p> <ul style="list-style-type: none"> (a) the circumstances in which Transpower may temporarily remove any assets forming part of the grid from service or reduce the capacity of assets to efficiently manage the operation of the grid; (b) the procedures and policies for Transpower to plan for outages and for carrying out such outages to: <ul style="list-style-type: none"> (i) ensure that Transpower involves designated transmission customers in making decisions on planned outages as much as possible; (ii) ensure coordination between Transpower and designated transmission customers

	(iii) enable Transpower to efficiently manage the operation of the Grid
	(c) specifies the procedures and policies for dealing with unplanned outages of the grid.
outage time:	The time during which power system equipment is not available for service . It includes: <ul style="list-style-type: none"> (a) Operating time; (b) Operational control (OC) transfer process time; (c) Maintenance switching time, and; (d) Work time.
permission to proceed:	The approval given by the Security co-ordinator to the Regional operator to proceed with the operation of grid system equipment .
permit:	A collective term for the access permit and the test permit . Under a permit , the recipient and their work party have temporary access for work activities to specific isolated equipment , which is in a defined state.
permit area (SM-EI):	A defined area, marked at ground or floor level, within which (including above or below): <ul style="list-style-type: none"> (a) There is equipment under an access or test permit. (b) Additional precautions may need to be taken to avoid harm from equipment or parts of equipment, including that adjacent to, above or below that under the access or test permit. <p><i>Notes:</i></p> <ol style="list-style-type: none"> 1. <i>Access and test permits are issued for work on, or within the relevant minimum approach distance of, equipment, not for work in permit areas.</i> 2. <i>There may be live equipment within the permit area i.e. it is not the intention of the permit area to delineate between live, de-energised and isolated equipment.</i> 3. <i>In switchyards, each permit area shall have a defined point of entry.</i>
permit rope (SM-EI):	Permit area boundary marker -yellow and green marker used at stations solely for the purpose of defining the boundaries of the permit areas . In switchyards , the marker shall be continuous. <i>Note: Where the permit area has defined point(s) of entry, the marker shall be continuous, e.g. rope, tape, chain.</i>
planned operating:	Operating which has been subjected to the normal planning/ approval (PROMS) process.
planned outage (Code):	For the purposes of part 12 of the Code , means an outage carried out in accordance with the planning requirements set out in the Outage Protocol .

plant request:	Consolidation of individual operational requests that share the same window.
point of connection (Code):	Means a point where electricity may flow into or out of a network , and for the purpose of technical Code A of schedule 8.3 means a grid injection point or a grid exit point .
point of isolation:	<p>(a) Electrical: A disconnecter, fuse-link, withdrawable CB etc. that, when open or removed, provides a specific minimum separation distance between live equipment and that which is isolated.</p> <p>(b) Mechanical: A gate, damper, valve etc. that, when closed, provides a physical barrier between a source of harm and equipment which is isolated.</p>
point of service (Code):	Means a normally contiguous electrical busbar of a Particular voltage where Transpower as a grid owner has agreed to provide services to one or more designated transmission customers.
portable earth/ temporary earth (SM-EI):	<p>An approved portable device for temporarily earthing isolated equipment for work access.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. For three phase a.c., a "set of earths" consists of portable earths that, when applied, effectively short circuit the three phases as well as connecting them to earth. 2. It does not include earthing trucks or other earthing devices for special situations.
power quality:	The electrical conditions to be found on the grid system at any physical point.
procedure:	Specified way to perform an activity.
process:	Set of inter-related resources and activities which transform inputs into outputs.
project manager:	A Transpower employee who is responsible for overseeing a contract.
project engineer:	A person who is responsible on behalf of the project manager for the overall co-ordination of all project activities involving the commissioning/ decommissioning of equipment .
protection:	The equipment provided for detecting abnormal conditions in a power system and then initiating fault clearance or actuating signals or indications.
public area:	That part of a station or communications site that is open for public access.

purging:	The controlled removal of a fluid or gas by replacing it with another.
quality audit:	Systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives.
quality system:	Organisational structure, procedures, processes and resources needed to implement quality management.
quality manual:	Document stating the quality policy and describing the quality system of an organisation.
ramp rate:	The rate at which the power is increased or decreased on a generator, on the HVDC link, or in the load. Expressed as MW/minute.
ramp up (HVDC):	The automatic change in mercury arc or thyristor pole power transfer during start up, shut down, or faults to attempt to maintain required overall HVDC power transfer.
reactive power control:	A control system which monitors and controls reactive power flows to ensure system voltages remain within minimum and maximum limits.
ready for livening notice:	The Transpower notice which confirms that the equipment to be livened is ready to be connected to the power system.
recall time:	The estimated time required during the work for the contractor to return the equipment in a condition suitable for service, including maintenance switching time.
received	Term used when logging that a maintenance switcher has received OC of equipment .
recipient (SM-EI):	A competent employee who receives, holds, may request transfer of, and returns, an access or test permit . <i>Note: The competence needs to be documented; refer to the definition documentation of competence.</i>
recipient applied safety measures (SM-EI):	See Safety measures .
reclose block (RCB):	A statement made by the RCB issuer to a recipient that equipment which livenes specified equipment/transmission circuit under live access will not be operated either automatically or manually.
reclose block approval:	Approval by the controller to the RCB issuer for a reclose block to be issued.

regional operator:	A Transpower employee who carries out power system equipment operating and/or control functions to the requirements of the System operator and grid asset owner .
regional planner:	A Transpower employee who collates approved plant requests submitted for contractor access to power system equipment and produces efficient and appropriate operating documentation for use by the regional operator in accordance with Transpower Service Specifications and other approved Transpower instructions.
removed from service:	Equipment isolated to the extent that it ceases to perform its designated function.
restart:	The HVDC equivalent of an auto reclose for a.c. transmission circuits .
restricted area (SM-EI):	An area or enclosure containing equipment that could cause serious harm, e.g. a switchyard . <i>Note: The area or enclosure will be subject to an entry control system determined by the asset owner.</i>
risk of trip:	An operating condition where there is a possibility of equipment tripping or HVDC blocking, resulting from work being done on or near power system equipment .
runbacks:	An automatic limit on maximum HVDC transfer when: <ul style="list-style-type: none"> (a) There is loss of HVDC signalling between Benmore and Haywards and hence loss of HVDC stabiliser controls, or (b) There are several transmission circuit, transformer or condenser outages at Haywards and/or Bunnythorpe, or (c) To limit d.c. earth switch current at Benmore, or (d) Haywards Voltage Stabiliser is off.
safety measures (SM-EI):	Measures taken to ensure work can be safely undertaken under an access or test permit , e.g. isolation, tagging and earthing. They are either issuer applied, or recipient applied. <i>Notes:</i> <ol style="list-style-type: none"> 1. Issuer applied safety measures include those applied by the employee issuing an assurance. 2. Issuer applied safety measures include those applied on behalf of the issuer, prior to issue of the access or test permit. 3. Recipient applied safety measures are applied, where necessary, in addition to those applied for access or test permit issue. 4. Earths applied by the work party to transmission or distribution circuits at the worksite are examples of recipient applied safety measures. 5. Safety measures may consist of ensuring that systems

*such as seal oil and hydraulic oil remain in service, in order that the **equipment** to be worked on remains in a safe state for work.*

safety observer (SM-EI):	An employee assigned the duty of observing and warning against unsafe approach to live equipment .
SCADA outage scheduler (SOS):	Application used by the regional operator to manage daily switching activities and change to offers to the system operator .
security co-ordinator:	The Transpower person with the overall authority to manage the real-time secure operation of the power system.
security management plan:	A plan outlining the options to manage security pre contingency.
short time planning:	Any outage planning required for any new or changed outages starting after 00:01 hrs of the current business day through to 23:59 of the next business day
shutters (switchgear):	Lockable barriers to prevent access into the spouts of withdrawable switchgear.
spinning reserve:	The available capacity of synchronised plant which can provide immediate assistance during a fall in system frequency.
sprag:	To render equipment incapable of operating by mechanically preventing its movement.
stability event (Code):	Severe power system faults that might lead to a defined contingent event, extended contingent event or loss of an interconnecting transformer or busbar section. For these faults it is deemed prudent to ensure that the transient and dynamic stability of the power system is maintained.
station (SM-EI):	A general term to cover substations, power stations and switching stations. It includes switchyards . <i>Note: It does not apply to ground mounted distribution substations, pole mounted substations, reclosers, disconnectors and sites of a similar nature.</i>
supplementary operating form:	An extra operating form used when additional items are required when actioning an existing operating sequence .
supply :	A measure of the rate of production of electrical energy.
switchgear group:	A circuit breaker and related disconnectors . The relationship is determined by switchgear numbering.
switchyard (SM-EI):	A restricted area , enclosed by a security fence, containing normally live conductors and/or other exposed live

	equipment.
system number (Code):	Means a coded number assigned to assets referred to in rule 2.1.1 of technical code A of schedule 8.3 of part 8 for the purposes of the operation of the grid and the management of the assets that, when used in conjunction with a locality name, uniquely identifies the assets.
system operator (Code):	Means the service provider for the time being who is appointed as system operator pursuant to the regulations.
system operator procedures:	Documentation provided and published by the system operator from time to time describing specified details of the process by which the system operator and dispatch customers meet the requirements of the Code .
system test (Code):	Means a test conducted on assets, with that asset connected to the grid, to assess the interaction of that asset with the grid.
tag:	An approved marking device used to mark equipment against an inadvertent change to the state of an isolation point.
tagged (SM-EI):	Marked to safeguard against an inadvertent change to the state of an isolation point or earthing continuity point. <i>Notes:</i> <ol style="list-style-type: none"> 1. Sometimes tags are applied to ensure a system remains in service to provide safety under an access or test permit, e.g. seal oil pumps must remain in service with hydrogen filled machines. 2. Specially coded and coloured locks may be used as tags.
test permit (SM-EI):	The permit for access to equipment that has been isolated for testing where procedures are required to control hazards created by the testing. Under a test permit , the recipient and their work party have temporary access for work activities to specific isolated equipment , which is in a defined state.
transfer of operational control process time:	The time required for the implementation and recording of the transfer of operational control to/ from the controller and the maintenance switcher .
transfer of operational control:	The transfer of authority and responsibility to control the operation of defined power system equipment within specified boundaries and conditions.
transient fault:	A fault that is self rectified immediately after the faulted equipment is tripped or disconnected.
transmission circuit (Code):	Chapter 7 of the Policy Statement 186 means: 186.1 any transmission line owned by a grid owner . 186.2 any distribution line owned by a participant to

	which not less than a sum of 60 MW of generation is connected and which distribution line is connected to the grid primarily for the purpose of injection into the grid.
transmission line:	A series of structures carrying overhead one or more transmission circuits .
transmission offer:	The information that asset owners of equipment forming part of or connected to the grid system submit to the system operator in the form set out in attachment 1C in order to make equipment forming part of the grid system available to the system operator for dispatch .
trip on close:	Also known as “Switch on to Fault”. A feature of some distance protection enabling it to trip instantaneously when its associated circuit breaker closes on to a fault, e.g. closed earth switch.
unplanned operating:	Operating (including that required to manage unplanned power system events (which time and/or circumstances prevent being subjected to the normal planning/ approval (PROMS) process.
unplanned outage (Code):	An outage not planned in accordance with the planning requirements set out in the outage protocol .
voltage collapse (Code): IEC 50 (604-01-22)	A sudden and large decrease in the voltage of the electrical system.
window:	A date/ time slot in a programme for planned access to power system equipment .
work time:	The time required by the work party to complete the planned work activities.

5. STANDARD ABBREVIATIONS

5.1 Logging and operating sequence abbreviations

Standard locality abbreviations are listed in TP.AG 10.11.

Abbreviations that are appropriate for the industry and can be used in the **log** or on **operating forms** are for example:

Operating actions:

ASM	apply safety measures
C/O	change over
CL	close
CTO	change to offer
DTF	distance to fault
OP	open
PTP	permission to proceed
RFLN	Ready for Livening Notice
RSM	remove safety measures

SEL	select
Equipment states:	
AFS	available for service
ATC	automatic tap changer control
HSB	hot standby
I & E	isolated and earthed
RFS	removed from service
ROT	risk of trip
RTS	returned to service
SWO	switch out
Operating forms/ documentation:	
ASS	Assurance
AP	Access Permit
GIR	Governance Interim Report
GOR	Grid Operating Report
GRP	group
MER	Major Event Report
OCR	Operational Control Record
OR	operational request
OS	operating sequence
RCB	reclose block
TP	test permit
Plant and equipment:	
AR	automatic reclose
Aux Sw	auxiliary switch
AVR	automatic voltage regulator
C	capacitor stack
CB	circuit breaker
cct	circuit
CSR	Continuous Signal Receive
CT	current transformer
CTS	cable transition station
CVT	capacitor voltage transformer
DS	disconnect
ES	earth switch
FDR	feeder
G	generator
GIS	gas insulated switchgear
HVDC	high voltage direct current
ITRIP	intertrip
LMU	line matching unit
LS	local service
MLS	master/local selector switches
MSD	maintenance/service/disable switch

ODJB	outdoor junction box
OLTC	on load tap change
PLC	power line carrier
RØ, YØ, BØ	phasing: red, yellow, blue
RTU	remote terminal unit
SA	surge arrester
SC	synchronous condenser
STC	static synchronous compensator
SVC	static var compensator
T	transformer
TSw	test switch
U	unit
VG	valve group
VT	voltage transformer
VV	valve (mechanical)

Electrical and mechanical terms and measures:

A	ampere
C/W	cooling water
DGA	dissolved gas analysis
E/F	earth fault
FTE	frequency time error
HV	high voltage
Hz	frequency
ITC	interruption to connection
kV	kilovolts
kVA	kilovoltampere
kvar	kilovoltampere reactive
kW	kilowatts
kWh	kilowatt-hour
L/O	lock out
LLW	live line work
LOC	loss of connection
LOS	loss of supply
LV	low voltage
LW	live work
MVA	megavoltampere
Mvar	megavoltampere reactive
MW	megawatts
O/C	overcurrent
ODS	outdoor station
P/P	pump
pf	power factor
rpm	revolutions per minute
UHF	ultra high frequency

V	volts
V/V	valve
VHF	very high frequency
W	watts

5.2 Other abbreviations

(See TP.AG 10.11 for location abbreviations)

AF	air forced
AN	air natural
ASR	alarm sender receive
AUFLD	automatic under frequency load disconnecting
Auto	automatic
Aux	auxiliary
BZ	bus zone
CBF	circuit Breaker Fail
CC	control centre
CIR	communication interruption request
Code	Electricity Industry Participation Code
DGA	dissolved gas analysis
CLO	close (request)
DNO	Do Not Operate (Notice)
DTC	designated transmission customer
ECC	Emergency (Regional Operating) Centre Central
ECN	Emergency (Regional Operating) Centre North
ECS	Emergency (Regional Operating) Centre South
EMS	Energy Management System
GXP	grid exit point
IP	interested party
LDC	leased direct circuit
LED	light emitting diode
LEL	lower explosive limit
LOC	location
LTS	lighting tracking system
MAD	Minimum Approach Distance
MADJ	Excel workbook used to calculate an adjustment factor
MAR	Minimum Approach Request
MDE	Market Data Entry
MOL	Manual Operational Log
MOS	Market Outage Scheduler
MMS	Maintenance Management System
NCCN	National Co-ordination Centre North
NCCW	National Co-ordination Centre Wellington
NZST	NZ standard time
OC	operational control
ODS	outdoor station
OF	oil forced
ON	oil natural
ONAF	oil natural air forced

OPGW	optical fibre ground wire
OPE	open (request)
OTH	other operational services (request)
PSO	power system operating (request)
RCB	reclose block (request)
RCC	Regional (Operating) Centre Central
RCN	Regional (Operating) Centre North
RCS	Regional (Operating) Centre South
RM	revenue metering access request
ROC	Regional Operating Centre
RS	removal from service (request)
RSLD	regional single line diagram
SCA	SCADA access (request)
SCADA	Supervisory Control and Data Acquisition
SCS	Substation Control System
SER	sequential event recorder
SFIR	System Fault and Interruption Report
SLD	single line diagram
SMS	Station Management System
SOS	SCADA Outage Scheduler
SPPR	standard/ specification project progress record
TPIX	Transpower Information Exchange Application
VDD	voltage detecting device
VHF	very high frequency

A REFERENCES

TP.AG 10.11	<i>Standard Site Abbreviations</i>
Code	<i>Electricity Industry Participation Code</i>
SM-EI	<i>Safety Manual – Electricity Industry</i>

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