



## Grid Code

### Abbreviations and Definitions

Issued April 2010

#### Abbreviations

A	Ampere
AC	Alternating current
AVR	Automatic Voltage Regulation
CCGT	Combined Cycle Gas Turbine
CD	Centrally Dispatched / Central Dispatch
CT	Current Transformer
DC	Direct Current
DSM	Demand Side Management
ECA/ECUOSA	Connection Agreement or Electrical Connection and Use of System Agreement
G	Giga or $10^9$
GC	General Conditions
GWh	Giga Watt Hour
HP	High Pressure
HV	High Voltage
Hz	Hertz
IEC	International Electro-technical Commission
ITU	International Telecommunications Union
k	Kilo or $10^3$
kV	Kilo-Volt
LV	Low Voltage
M	Mega or $10^6$
MHEW	Ministry of Housing Electricity and Water, Sultanate of Oman
ms	milli second
MVA	Mega-Volt-Ampere
Mvar	Mega-Volt-Ampere Reactive / Mega-var (Reactive Power)
Mvarh	Mega-var- hour (Reactive Energy)
MW	Mega-Watt (Active Power)
MWh	Mega-Watt-hour (Active Energy)
OC	Operating Code (of the Grid Code)
PPA	Power Purchase Agreement
PSS	Power System Stabiliser



PAEW	Public Authority for Electricity and Water
PWP	Power and Water Procurer
PWPA	Power and Water Purchase Agreement
PC	Planning Code
RAEC	Rural Areas Electricity Company
SCADA	Supervisory Control and Data Acquisition
SD1	Schedule Day 1 (or another day as the number indicates)
SDC	Scheduling and Dispatch Code
SPD	Standard Planning Data
VA	Volt-Ampere
VT	Voltage Transformer
WD-MHEW	Water Department of the Ministry of Housing Electricity and Water, Sultanate of Oman
PAEW	Public Authority for Electricity and Water

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## **Definitions**

The following definitions identify the meanings of words used in the Grid Code. Plurals of the words and variations of tense are deemed to have similar meanings;

### **Accuracy Test**

A test to determine the percentage error of any item of a Metering System;

### **Active Energy**

The electrical energy produced during a time interval measured in units of watt-hours or standard multiples thereof. Where the term **Energy** is used without any modifier, this will have the same meaning;

### **Active Power**

The product of voltage and the in-phase component of alternating current measured in units of watts or multiples thereof. When the term **Power** is used without any modifier, this will have the same meaning;

### **Actual Metering Point**

The physical point at which electricity is metered;

### **Alert**

A warning issued by OETC to inform Users of potential Emergency Conditions on the System;

### **Ancillary Services**

The services which (1) Licensed Generators, Licensed Generators/Desalinators or other Persons Connected to a Transmission System may be required to provide from time to time in connection with the security and stability of such Transmission System or the Total System; and (2) are provided for in either (i) an agreement between a Licensed Transmission System Operator or a Licensed Distribution System Operator and any Person or (ii) an agreement between a Licensed Generator or a Licensed Generator/Desalinator and the PWP;

### **Ancillary Services Agreement (ASA)**

An agreement for the purchase of Ancillary Services by OETC or PWP from a User;

### **Autogenerator**

A Person that Generates electricity primarily for the purposes of self-supply;

### **Automatic Under-Frequency Relays**

Frequency relays used for the automatic de-energising of feeders Connecting Consumers at preset Frequencies to assist stabilising the Active Power balance between Demand and Available Generation;

**Automatic Voltage Regulation (AVR)**

A continuously acting automatic excitation system to control Genset terminal voltage;

**Availability**

The MW Capacity of a CDGenset declared Available to OETC and/or PWP by a Power Producer and **Available** shall be construed accordingly;

**Availability Notice**

A notice issued by a Power Producer, in the form set out in SDC1, stating the Availability of a Genset to apply for the following Schedule Day;

**Back-Up Protection**

Protection equipment or system that is intended to operate when a System fault is not cleared because of a failure of the Main Protection to operate;

**Black Start**

The procedure necessary for the recovery from a Partial System Shutdown or a Total System Shutdown;

**Bulk Supply**

Bulk Supply means the Bulk Supply by the PWP of (1) electricity to any Licensed Supplier or (2) Desalinated water to the Ministry of Housing, Electricity and Water;

**Bulk Supply Points**

The point at the interface between OETC and Licensed Distributors where Bulk Supply Metering is located;

**Burden**

Burden is the electrical Load, measured in VA, connected to current and/or voltage transformers for the purposes of Metering, protection or measurement;

**Business Day**

A day on which banks in Oman are open for business purposes;

**Calibration**

The procedure whereby the relevant percentage errors of any item of Metering Systems are determined and, where appropriate, modified;

**Capacity**

The capacity of any Plant to produce, deliver or receive electricity, as the case may be, stated in MW at an assumed or agreed Power Factor or in MVA;

**Caution Notice**

A notice issued in accordance with Safety Rules approved by OETC and placed at a point of adequate physical separation which must be in accordance with, and maintained in accordance with Safety Rules to allow safe working;

**CCGT Module**

A group of Gensets, comprising one or more Gas Turbine Gensets (or other gas based engine set) and one or more Steam Turbine Gensets where, under normal Operation, the waste heat from the gas turbines, is used to drive the steam turbine(s) and the component sets within the CCGT Module are designed to Operate together for increased efficiency and are registered as a CCGT Module under this Code;

**CDGenset (Centrally Dispatched Genset)**

A Connected Genset with a Registered Capacity in excess of 5 MW and which is subject to the procedure of Central Dispatch;

**Central Dispatch (CD)**

The process of Scheduling and issuing Dispatch Instructions by OETC;

**Check Meter**

A device where required, that duplicates and provides back up to the Main Meter for measuring and recording units of Active Power, Active Energy, Reactive Power or Reactive Energy or other electrical quantities;

**Code Notices**

A notice served under or for the purposes of the Grid Code;

**Cold**

A situation in which a Genset has been shut down for more than forty-eight (48) hours if the Genset is in combined cycle configuration and more than twenty-four (24) hours if the Genset is in open cycle configuration;

**Committed Project Planning Data**

The data relating to the proposed User development at the time of acceptance of an offer for a Connection Agreement and the subsequent data required by OETC;

**Completion Date**

Has the meaning set out in the Connection Agreement with each User, or in the absence of a definition, it shall mean the date when a User is expected to Connect to or start using OETC's Transmission System;

**Complex**

One or more Connection Sites together with the associated Production Facility, Transmission substation and/or Distribution substation and/or associated Plant, as appropriate;

**Connection**



In relation to any Premises, Production Facility or System, the presence of a physical connection between those Premises, Production Facility or System and the System of a Licensed Transmission System Operator or Licensed Distribution System Operator other than a System owned or Operated by the Rural Areas Electricity Company and **Connect** and **Connected** shall be construed accordingly;

### **Connected Planning Data**

The estimated values assumed for planning purposes by OETC if and when confirmed or replaced by validated actual values;

### **Connection Offer**

The terms and conditions offered by OETC to a User for Connection of a User's System to the Transmission System as a result of application for Connection of Plant made in accordance with OETC's Licence;

### **Connection Point**

The point on the Transmission System to which a User Connects its System to the Transmission System;

### **Connection Site**

The physical site belonging to OETC or a User where a Connection Point is located;

### **Constrained Schedule**

A Generation Schedule and Desalination Schedule produced by OETC that takes account of limits on the Total System and that is developed in accordance with the Scheduling and Dispatch Code SDC1.4.9;

### **Consumer**

A Person who is Supplied with electricity at Premises for consumption at those Premises;

### **Contingency Reserve**

The margin of Available Generation Capacity over forecast Demand that is required in the period from 24 hours ahead down to real time to cover against uncertainties in Genset Availability and against Demand forecast errors;

### **Control Centre**

The centre from where Scheduling, Dispatch and Operational Instructions are given to other control rooms or Plant operators. The term is used to any such centre which may be a fully fitted control centre, an operational room or a Person designated with such responsibilities;

### **Control Phase**

The phase from the issue of the Generation Schedule and Desalination Schedule on the day ahead (D-1) to real time Operation;

### **Daily Status Form**

The form used by Power Producers for submission of data to OETC and PWP under SDC1;

**Daily Status Form – OETC Assumed Data**

The form used by OETC to inform Power Producers of the data to be used by OETC in connection with Scheduling and Dispatch following failure by the Power Producer to submit the Daily Status Form;

**Electrical Delivery Point**

The point on the High Voltage terminals of the Production Facility at which the Production Facility Connects to the Transmission System and at which electrical Energy is delivered in accordance with PPAs and PWPAs and by reference to which the electrical Energy is measured.

**Deloaded**

The condition under which a CDGenset has reduced or is not delivering Active Power to the System to which it is Synchronised;

**Demand**

The demand for Active Power or Reactive Power;

**Demand Control**

Any method of achieving a reduction or increase in Demand;

**Demand Control Imminent Warning**

A warning that may be issued within the following 30 minutes, relating to a Demand reduction which will be issued by OETC to Licensed Distributors and to Power Producers at Production Facilities and to Directly Connected Consumers;

**Demand Intertrip Scheme**

Automatically initiated circuit breaker tripping sequences that are switched into service following instructions from OETC or a Licensed Distributor;

**Demand Side Management**

The controlled reduction in Demand achieved in real time by a User;

**Desalination**

The production of demineralised or potable water by desalination and **Desalinated** shall be construed accordingly;

**Desalination Unit**

A unit forming part of the Production Facility and which is capable of producing Desalinated water;

**Designated Operator**

The operator approved in writing by the relevant User as competent to carry out the procedures in agreed Operational Instructions;

**Desynchronise**

The act of taking a Genset off a System to which it has been Synchronised by opening any connecting circuit breaker;

**Detailed Planning Data**

The additional data required by OETC as part of the Planning Code to allow detailed stability studies to be carried out;

**Directly Connected**

A Consumer or User which imports and/or exports electricity directly from/to the Transmission System and **Direct Connected** shall be construed accordingly;

**Dispatch**

The general process by which instructions are determined and the issuing of those instructions, to (1) Licensed Generator and/or Licensed Generator/Desalinator as to the Operation or cessation of Operation of their Production Facilities and (2) other Persons whose facilities are Connected and **Dispatch Instructions** shall be construed accordingly;

**Distribution**

Means, in relation to electricity, the transport of electricity by means of a Distribution System and **Distribute** shall be construed accordingly;

**Distribution System**

A System which; (i) is not a Transmission System; (ii) is used to transport electricity; (iii) consists (wholly or mainly) Electric Lines and Electric Plant (namely, Electric Lines and Electric Plant with voltage levels of less than a nominal 132kV) and (iv) which is used wholly or mainly for the transport of electricity to Premises;

**Disturbance**

Any sudden significant change to the Total System caused by a sudden loss of a Genset, or the interruption of Demand, or the failure of Plant;

**Earthing Device**

A means of providing a connection between a conductor and the general mass of earth, being adequate to allow the flow of the maximum prospective earth fault current, at that point on the Total System and **Earthing** shall be construed accordingly;

**Economic Purchase**

The purchase on the best economic terms reasonably obtainable, having regard to quality, quantity, the nature of the things to be purchased, the available manner of delivery and the future security, reliability and diversity of supply of the things to be purchased;

**Electric Lines**

Any line, whether underground or overground, which is used for carrying electricity for any purpose and includes, unless the context otherwise requires;

- (a) any support for any such line, including, without limitation, any structure, pole, pylon or other thing in, on, by or from which any such line is or may be supported,



- carried or suspended;
- (b) any Plant Connected to any such line for the purpose of carrying electricity; and
  - (c) any wire, cable, tube, pipe or other similar thing (including its casing, insulator or coating) which surrounds or supports, or is surrounded or supported by, or is installed in close proximity to, or is supported, carried or suspended, in association with, any such line;

### **Electric Plant**

Any plant, apparatus, equipment or appliance used for, or for purposes connected with, the Generation, Transmission, Dispatch, Distribution or Supply of electricity, other than;

- (a) an Electric Line;
- (b) a Meter used for ascertaining the quantity of electricity supplied to any Premises; and
- (c) an electrical appliance under the control of a Consumer;

and **Plant** shall be construed accordingly;

### **Electric Time**

The time shown on an electric clock connected to the Total System;

### **Electrical Connection Agreement**

An agreement between a User and OETC for the Connection of the User's System to the Transmission System;

### **Electrical Connection and Use of System Agreement**

An agreement between OETC and a System User to provide principally for (i) the Connection of System User's Plant to the Transmission System; (ii) the calculation of charges for use of the Transmission System; and (iii) to record the mechanism relating to the payment of Connection Fees;

### **Embedded Genset**

Gensets that are Connected to a Distribution System or the System of any other User, such Connection being either a Direct Connection or a Connection via the busbar of another User but with no Direct Connection to the Transmission System, where

Large Embedded Gensets are deemed to be those with a Registered Capacity of greater than 5MW; and

Small Embedded Gensets are deemed to be those with Registered Capacity of less than or equal to 5MW;

### **Embedded Power Producer**

A User Operating an Embedded Genset;

### **Emergency Conditions**

Abnormal System conditions that require automatic or rapid manual action to prevent or limit loss of Transmission facilities, Distribution facilities or Generation Capacity that could adversely affect the reliability of the Transmission System;

**Emergency Instructions**

A Dispatch Instruction issued by OETC that may require an action or response that is outside the limits implied by a Daily Status Form submitted by a CDGenset or instructions issued by OETC to prevent or limit abnormal System conditions;

**Emergency Manual Demand Shedding**

The manual de-energisation of Consumers or Electric Lines feeding Consumers in Emergency Conditions to assist regaining the Active Power balance between Available Generation Capacity and Demand;

**Expert**

A Person with appropriate educational and practical experience to provide relevant advice to the subject in question and who should have no direct involvement with any of the parties;

**Exported**

In relation to electricity, electricity which is Generated in Oman and which is transported from Oman and **Export** shall be construed accordingly;

**Final Station Outage Schedule**

The Outage schedule submitted by a User to OETC for Operational Year 1 specifying for each CD Genset and Desalination Unit owned by that User, the proposed timing for Outages and Winter Downtime;

**Final System Outage Schedule**

The Outage schedule for Operational Year 1 produced by OETC in accordance with the provisions of OC 2, specifying for each CD Genset and Desalination Unit in the Total System the proposed timing for Outages and Winter Downtime;

**Five-Year Statement**

A statement, prepared by OETC, in accordance with the terms of the Transmission Licence showing for each of the 5 succeeding Operational Years, amongst other matters, the forecast Demands and Power flows on the Transmission System;

**Flexible Outage**

A Planned Outage that, at the request of OETC, can be deferred or advanced by a period;

**Flicker Severity (Long Term)**

A value derived from 12 successive measurements of Flicker Severity (Short Term) over a two hour period and a calculation of the cube root of the mean sum of the cubes of 12 individual measurements.

**Flicker Severity (Short Term)**

Measure of the visual severity of flicker derived from the time series output of a flicker meter over a 10 minute period and as such provides an indication of the risk of customer complaints.

**Forced Outage**

An Outage for which no timely notice can be provided by the User to OETC;

**Frequency**

The number of alternating current cycles per second (expressed in Hertz) at which a Total System is running;

**Frequency Sensitive Mode**

The Operation of a CDGenset (which can be part of a CCGT Module) that will result in Active Power output changing automatically in response to changes in Total System Frequency;

**Fuel**

Natural gas or fuel oil;

**Gas Turbine Genset**

A Genset with a gas turbine as its prime mover;

**Gas (SF<sub>6</sub>) Zone Diagram**

A single line diagram showing boundaries of, and interfaces between, SF<sub>6</sub> gas-insulated HV Plant modules which comprise part, or the whole, of a substation at a Connection Site, together with the associated stop valves and SF<sub>6</sub> gas monitors required for the safe Operation of the Transmission System or the User System;

**Genset (Generating Set)**

Any Plant which produces electricity (including a (single) Genset and its associated prime mover, within a CCGT Module);

**Genset De-loading Rate**

The rate at which a Genset can decrease its output of Active Power from Maximum Generation to Minimum Generation. The Genset De-loading Rate for each Genset will be as detailed in the Operating Parameters;

**Genset Loading Rate**

The rate at which a Genset can increase its output of Active Power from Minimum Generation to Maximum Generation;

**Genset Run-Down Time**

The time taken for a gas turbine or steam turbine rotor to come to a complete stop after the opening of the Genset circuit breaker following initiation of a normal stop signal initiation;

**Genset Run-Up Time**

The time taken for a gas turbine or steam turbine to reach full speed at no load from the initiation of a start signal. The Genset Run Up Time for each Genset will be detailed in the Operating Parameters;

**Generation**

Means the production of electricity by any means and "**Generate**" and "**Generated**" shall be construed accordingly;

**Generator Performance Chart**

A diagram which shows the MW and Mvar capability limits within which a Genset will be expected to Operate under steady state conditions;

**Generation Schedule and Desalination Schedule**

A statement prepared by OETC of the CDGensets and Desalination Units that may be required to meet the Total System Demand at all times, and ensure (as far as possible) the integrity of the Transmission System and the security and quality of Supply, with an appropriate margin of reserve;

**Generation Security Planning Standard**

The standards by which PWP's performance in maintaining Generation security, and the Availability and quality of the Total System may be measured, as prescribed in its Licence;

**Good Industry Practice**

Acting in good faith to perform obligations in accordance with the requirements of the Sector Law and international good practice in the electricity and Desalination industries;

**Government**

The Government of the Sultanate of Oman;

**Grid Code**

Means the Grid Code prepared pursuant to Condition 3 of OETC's Transmission Licence;

**Grid Code Review Panel**

The panel with the functions set out in GC.4 of the General Conditions;

**High Frequency Response**

An automatic reduction in the Active Power output from a CDGenset in response to an increase in Total System Frequency above the Target Frequency notified by OETC under SDC3;

**High Voltage (HV)**

A nominal alternating voltage equal to or exceeding one kilovolt;

**Hot**

When referring to a Genset, it means a Genset that has been shut down for less than eight (8) hours if the Genset is in combined cycle configuration and less than two (2) hours after such Genset has been shut down if the Genset is in open cycle configuration;

**Import/Export Contract**

A contract entered into in accordance with Article [(85)(2)] of the Sector Law for the Import or Export of electricity;

**Imported**

In relation to electricity, electricity that is Generated outside Oman and which is transported into Oman and **Import** shall be construed accordingly;

**Incident**

An unscheduled or unplanned occurrence on, or relating to, a System (including Embedded Gensets) including, faults, events and breakdowns and adverse weather conditions being experienced;

**Inflexible Outage**

A Planned Outage that cannot be deferred or advanced by a period at the request of OETC, under OC2;

**Instation**

Equipment located within OETC Premises that receives and stores Metering Data from Outstations;

**Interconnection Agreement**

An agreement made between OETC, a Licensed Distributor or RAEC and a Person external to the Sultanate of Oman, relating to the transfer of Power and or Active Energy/Reactive Energy and or Ancillary Services across an Interconnector;

**Interconnector**

A facility that Connects two Systems;

**Interface Agreement**

An agreement between a User and OETC containing provisions for dealing with the consequences of a User owning or Operating Plant which is sited on another User's land and/or for the sharing of facilities and/or the provision of services at or near a Connection Site;

**Internal Interconnection**

A Connection that facilitates the transfer of electricity to or from OETC's Transmission System, the Distribution System of a Licensed Distributor or a User System into or out of another System located within Oman. A single Internal Interconnection may comprise several circuits Operating in parallel;

**Internally Interconnected Party**

A Licensed Person located in Oman that owns and/or Operates a Transmission System, a Licensed Distribution System and/or Plant for the purpose of providing Energy and/or Ancillary Services to other Users and/or OETC;

**International Interconnected Party**

A Person responsible for the operation of an electrical Transmission System or Distribution System outside the Sultanate of Oman that is Connected to a System that exists within Oman;

**International Interconnection**

An Interconnector that Connects a System that exists within Oman with a System that exists outside Oman and **International Interconnection** shall be construed accordingly;

**Islanded**

Following a Total System Disturbance, a situation in which parts of the System with its Connected Production Facilities become detached from the rest of the Total System;

**Isolating Device**

A device used for achieving electrical isolation;

**Isolation**

The disconnection of HV Plant from the remainder of the System in which that HV Plant is situated in accordance with OC8;

**Licence**

An authorisation to undertake a Regulated Activity issued by the Regulatory Authority pursuant to the Sector Law;

**Licensed Distribution System Operator**

A Person who is the holder of a Distribution Licence and **Licensed Distributor** shall be construed accordingly;

**Licensed Generator**

A Person who is the holder of a Generation Licence;

**Licensed Generator/Desalinator**

A Person who is the holder of a Generation and Desalination Licence;

**Licensed Supplier**

A Person who is the holder of a Supply Licence;

**Licensed Transmission System Operator**

OETC and each other Person who is the holder of a Transmission Licence;

**Load**

The Active or Reactive Power, as the context requires, Generated, Transmitted or Distributed;

**Local Interrogation Unit**

Portable or fixed equipment capable of interrogating, updating and/or programming an Outstation;

**Local Safety Instructions**

Instructions on each User site and OETC site approved by OETC or the relevant User, setting out the methods to achieve safety for those working on Plant to which their Safety Rules apply;

**Low Voltage or LV**

An alternating voltage less than one kilovolt;

**Main Meter**

The primary Meter for measuring and recording electrical quantities;

**Main Protection**

Protection equipment or system expected to have priority in initiating fault clearance or an action to alleviate an abnormal condition on the Total System;

**Maximum Generation (Max Gen)**

The maximum stable electrical output that a Production Facility can make Available under Emergency Conditions;

**Maximum Water Production**

The maximum water production achievable in one hour on the Schedule Day;

**Measurement Transformers**

Voltage and/or current transformers or combinations thereof used in Metering Systems;

**Member**

A Person who is a member of the Grid Code Review Panel;

**Merit Order**

An order for ranking Available Production Facilities which order shall aim to optimise Total System economy, security, stability and reliability; and shall otherwise be determined by OETC and each other Licensed Transmission System Operator in accordance with its Transmission Licence;

**Meter**

A device for measuring and recording units of Active Power, Active Energy, Reactive Power or Reactive Energy or other electrical and water quantities;

**Meter Certificate**

The statement issued by the Grid Code Review Panel confirming that a Meter or Metering System complies with the requirements of the Metering and Data Exchange Code;

**Meter Owner**

The Person responsible for ensuring the procurement, installation, testing, commissioning and operation and maintenance of Meters;

**Meter Register**

A device associated with a Meter, from which it is possible to obtain a visual reading of the quantities that have passed the Meter;

**Meter Registration System**

A system that uniquely identifies the Meter and Users associated with the Meter and contains pertinent data relating to the Meter as required by the Meter and Data Exchange Code;

**Meter Service Provider**

A Person that provides to a Meter Owner Meter services such as the installation, commissioning, operation, maintenance, and general servicing of Metering Systems;

**Metering**

The activity of measuring and recording units of Active Power, Active Energy, Reactive Power or Reactive Energy or other electrical and water quantities using a Metering System or a Meter;

**Metering Communication System**

The system of communications between Meters, Local Outstations and Remote Instations;

**Metering System**

The group of equipment including Meters, time switches, Measurement Transformers, metering protection and isolation equipment including alarms, circuitry, associated data storage and data communications equipment that are part of the Active Energy, Reactive Energy and Demand measuring equipment at or relating to a Connection Site;

**Minimum Generation (Min Gen)**

The minimum stable output Power which is registered for a CDGenset through the Planning Code and/or the Scheduling and Dispatch Code, with OETC;

**Minimum Shutdown Time**

The minimum amount of time between a CDGenset being Desynchronised and being able to Synchronise again;

**Notice to Synchronise**

The amount of time (in minutes) that is declared by a Power Producer for a CDGenset to enable it to be Synchronised following receipt of a Dispatch Instruction from OETC;



### **Numbering and Nomenclature Policy**

The policy document of OETC or a Licensed Distributor setting out a consistent and distinct numbering and nomenclature system of HV Plant;

### **Oman Electrical Standards (OES)**

Standards and regulations in relation to safety of equipment and electrical Systems and procedures associated with the specification and Operation of electrical Systems, formerly issued by the Ministry of Housing Electricity and Water, and known as Oman Electrical Standards. Such standards may from time to time be reviewed, modified or replaced pursuant to the Sector Law and including any such new standards as may be established, reviewed or modified from time to time pursuant to the Sector Law;

### **Operating Margin**

The combination of Contingency Reserve and Operating Reserve;

### **Operating Parameters**

The technical capabilities, flexibilities and limitations of a Genset, taking into account changes due to Site Rating, registered in the Operational Planning Code, OC2 and notified under the Scheduling and Dispatch Code through the Daily Status Form, as amended in accordance with these Codes;

### **Operating Reserve**

The additional output from Gensets or the reduction in Demand that can be realised in real time Operation to contribute to containing or correcting a Frequency deviation to an acceptable level following a sudden change in Demand or Generation;

### **Operation**

A planned, scheduled or erroneous action relating to the Operation of part of the Total System and **Operate** will be construed accordingly;

### **Operation Diagram**

A diagram that is a schematic representation of the HV Plant and the Connections to all external circuits and a Connection Site, incorporating its numbering, nomenclature and labelling;

### **Operational Effect**

Any effect on the Operation of another System that causes the Transmission System or the User's System to Operate (or be materially at increased risk of Operating) differently to the way in which they would or may have normally Operated in the absence of that effect;

### **Operational Instructions**

Instructions and procedures issued in Connection with the actual Operation of Plant;

### **Operational Log**

A chronological record of messages relating to Operational Instructions and safety coordination sent and received by each operator and Safety Coordinator under OC8;

**Operational Planning Phase**

The period from 8 weeks to the end of the 2<sup>nd</sup> Operational Year ahead and **Operational Planning** shall be construed accordingly;

**Operational Test**

A test carried out in order to acquire information in respect of Plant under pre-determined System conditions;

**Operational Year**

The year running 1 April to 31 March where Operational Year 0 means the current Operational Year, Operational Year 1 means the following Operational Year, etc.;

**Outage**

In relation to a Genset or Desalination Unit, an event, which affects a Power Producer's ability to make Capacity Available. In relation to OETC, or a Licensed Distributor, the removal of any part of the Transmission or Distribution Systems for repair or maintenance, or as a result of failure or breakdown;

**Outstation**

On-site equipment which receives data from local equipment and may perform some processing of data before transmitting the data to an Instation or SCADA system or downloading to a Local Interrogation Unit on request.

When used with Metering Systems the Outstation will store data from a Meter(s) and may perform some processing of data. These functions may be facilitated in one or more separate units or may be integral with the Meter;

**Overall Speed Droop**

The percentage drop in the Total System Frequency that would cause the Genset, under free governor action, to alter its output from zero to its full Capacity;

**Partial System Shutdown**

As for a Total System Shutdown except that all Generation has ceased in a part of the Total System that has become detached from other parts of the Total System and there is no electricity Supply from other parts of the Total System, so it is necessary to invoke Black Start procedures;

**Partially Constrained Schedule**

A Generation Schedule and Desalination Schedule produced by OETC that takes account of limits on the Total System imposed by the Transmission System and as described in SDC 1.4.9;

**Person**

An individual, partnership, company, firm, trust, body corporate, government, government body, authority, emanation, agency, instrumentality, unincorporated body or an association;

**Planned Outage**

An Outage planned at least seven days in advance of the event;

**Planned Rota Demand Shedding**

The manual de-energisation and re-energisation according to planned rotas of Consumers or Electric Lines feeding Consumers in Emergency Conditions to maintain the Active Power balance between Available Generation and Demand;

**Planning Margin**

The margin by which electricity Generation Capacity must exceed forecast Demand in the planning years to ensure that the Generation Security Planning Standard is met;

**Plant Owner**

The Person responsible for ensuring the procurement, installation, testing, commissioning and Operation and maintenance of Plant;

**Point of Common Coupling**

That point of the Transmission System electrically nearest to the User installation at which more than one User is Connected;

**Power Factor**

The cosine of the phase angle between the Volt-Amperes and the Active Power component;

**Power Producer**

Any Person that Generates electricity and/or which Operates one or more Genset(s), which Connect to the Transmission System, or Distribution System and Operate Synchronously with that Transmission System or Distribution System. This includes a Person that Operates a Desalination Unit;

**Power Purchase Agreement (PPA)**

An agreement entered into by PWP and a Licensed Generator pursuant to which the PWP agrees, amongst other things, to purchase the Production Capacity and Output associated with the relevant Production Facilities;

**Power and Water Purchase Agreement (PWPA)**

An agreement entered into by PWP and a Licensed Generator/Desalinator pursuant to which the PWP agrees, amongst other things, to purchase the Production Capacity and Output associated with the relevant Production Facilities;

**Power and Water Purchaser (PWP)**

The Person of this name performing the functions assigned to it under the Sector Law;

**Preliminary Project Planning Data**

Means the data relating to the proposed User development at the time a User applies for a Connection Agreement but before an offer is made and accepted by the applicant User;

**Premises**

Any land, building or structure occupied or used by a Person;

**Primary Control**

A CDGenset operating mode which will result in Active Power output changing in response to a change in Frequency in a direction which assists to stabilise the Frequency at any level by operating so as to provide Primary Response and/or Secondary Response proportional to the difference between the speed/Frequency Target value and the measured speed/Frequency value;

**Primary Response**

The automatic increase in Active Power output of a CDGenset or a decrease in the Demand for Active Power in response to a fall in the Frequency of the Total System. The response will be fully Available within 5 seconds from the time of the Frequency fall;

**Production Capacity**

The electricity Generation Capacity or the combined electricity Generation and water Desalination Capacity of a Production Facility, as the context so requires;

**Production Facility**

Plant which is used for the Generation of electricity or the combined Generation of electricity and Desalination of water and includes, as applicable, all associated Electric Lines, Electric Plant and water equipment;

**Programming Phase**

The period from 8 weeks down to the issue of the Generation Schedule and Desalination Schedule on the day ahead (D-1);

**Proposed Station Outage Schedule**

The proposed Outage schedule submitted by a User to OETC for Operational Year 2 specifying for each CD Genset and Desalination Unit installed in the Production Facility owned by that User, the proposed timing for Outages and Winter Downtime;

**Proposed System Outage Schedule**

The Outage schedule for Operational Year 2 produced by OETC in accordance with the provisions of OC 2, specifying for each CD Genset and Desalination Unit in the Total System the proposed timing for Outages and Winter Downtime;

**Protection**

The provision for the detection of fault conditions on the Total System and the automatic or manual initiation of fault clearance action, including audible and visual alarms, indications and data logging;

**Provisional Running Order**

A statement prepared and issued by OETC to the Power Producer pursuant to SDC1, which indicates for each CDGenset and Desalination Unit owned or controlled by the Power



Producer, the expected output pattern and the required Synchronising and Desynchronising times for the following day;

### **Reactive Compensation Plant**

Reactors and capacitors Connected to the System to compensate in part for excesses of Reactive Power;

### **Reactive Energy**

The integral with respect to Reactive Power, measured in units of voltampere reactive hours (Varh) and standard multiples thereof;

### **Reactive Power**

The product of alternating voltage and current and the sine of the phase angle between them measured in units of voltamperes reactive (vars) and standard multiples thereof.

Reactive Power Generation or output is an export onto the System and is referred to as lagging Reactive Power or lagging Mvar, and Reactive Power absorption is an import from the System and is referred to as leading Reactive Power or leading Mvar;

### **Red Warning**

A warning that will be issued by OETC by 16:00 hours on the day ahead to those Licensed Distributors and Directly Connected Customers who will or may subsequently receive instructions under the Operating Code OC4;

### **Reference Conditions**

Reference ambient conditions, the lower heating value of natural gas, and Frequency and Genset Power Factor as specified in the PPA and PWPA;

### **Registered Capacity**

In relation to a Genset and/or a Desalination Unit that does not form part of a CCGT Module, the Production Capacity of that Genset taking into account changes due to site rating as registered with OETC and, as amended from time to time in accordance with the Grid Code. In the case of a CCGT Module, the Production Capacity of the CCGT Module taking into account changes due to site rating, as declared by the Power Producer and amended from time to time in accordance with the Grid Code;

### **Registered Data**

Data submitted to OETC by Users describing the parameters of their Plant and Systems, including the Operating Parameters of Gensets and Standard and Detailed Planning Data and which is maintained by OETC as a continuing record that can be changed by formal documentation;

### **Regulatory Authority**

The body established pursuant to Article [(38)] of the Sector Law;

**Remote Instations**

Computer-based systems operated by OETC that may collect or receive Metering data on a routine basis from Outstations;

**Risk of Trip**

The Operation of a Genset when the failure of any single piece of auxiliary equipment could result in the loss of the Genset's Active Power and/or Reactive Power output;

**Rural Areas Electricity Company (RAEC)**

The Company of that name established pursuant to Article (6) of the Sector Law;

**Safety Coordinator**

A Person nominated by a User to be responsible for the coordination of Safety Precautions at a Connection Point and/or a Bulk Supply Point when work which includes testing is to be carried out on a System which necessitates the provision of Safety Precautions on HV Plant and **Safety Coordination** shall be construed accordingly;

**Safety Earthing**

The connection to the general mass of earth of HV conductors by an Earthing Device in accordance with OC8;

**Safety From The System**

The condition that safeguards Persons when work is to be carried out on a System from the dangers that are inherent in the System;

**Safety Permits**

Safety documents issued under the Safety Rules relating to safe conditions for working on Plant;

**Safety Precautions**

The Isolation and or Earthing of HV Plant, posting of safety tags, use of safety equipment and other measures to ensure safety;

**Safety Rules**

The rules of OETC or a User that establish a safe system of working on HV Plant;

**Schedule Day**

The 24 hour period starting at 0000 hrs (midnight) of the day concerned. Schedule Days are designated SD0, SD1, SD2 etc, where SD0 is today in real time;

**Scheduling**

The process of compiling a Generation Schedule and Desalination Schedule in accordance with SDC1 and **Schedule** will be construed accordingly;

**Secondary Response**

The automatic increase in Active Power output of a CDGenset or a decrease in the Demand for Active Power in response to a fall in the Frequency of the Total System;

**Sector Law**

The Law Governing the Privatisation and Regulation of the Electricity Sector, Sultani Decree No. [ /2003];

**Short Notice Outage**

An Outage for maintenance performed at no less than 48 hours notice to OETC, the approval of which will be at the sole discretion of OETC;

**Significant Incident**

An Incident that OETC has determined shall be defined as significant in the context of reporting in OC5;

**Site Common Drawings**

Drawings that incorporate Connection Site layout drawings, electrical layout drawings, common protection/control drawings and common services drawings prepared for each Connection Site;

**Site Investigations**

Tests conducted in relation to Plant and operational procedures at Production Facilities and User sites or to monitor and assess the characteristics of Plant;

**Site Responsibility Schedule**

A schedule forming part of the Connection Agreement containing the information and prepared in accordance with the Connection Conditions;

**Speed Governor (Speed Control)**

The mechanical and/or electrical equipment used to control the rotational speed of a Genset rotor according to a speed droop characteristic;

**Spill**

Energy supplied to the Total System after some captive on-site Demand has been met;

**Spill Contract**

A contract between a Licensed Supplier and an Autogenerator, entered into in accordance with Article (35)(7) of the Sector Law and Condition 3 of the PWP Licence for the purchase by the Power and Water Procurer of Production Capacity and/or Output;

**Spinning Reserve**

Those Gensets, which form part of the Operating Reserve, that are Synchronised to the Total System;

**Standard Planning Data**

The general data required by OETC under the Planning Code;

**Steam Turbine Genset**

A Genset with a steam turbine as its prime mover;

**Summer Period**

The period commencing 00:00 on 1 April in a Gregorian Calendar Year and ending at 24:00 on 30 September in the same Gregorian Calendar Year;

**Supply**

In relation to electricity, the Supply of electricity to any Premises and **Supplied** and **Supplies** shall be construed accordingly;

**Synchronised**

The condition where a Genset, or a System, is Connected to the busbars of another System or Total System, so that the Frequencies and phase relationships of that Genset or System are identical (within operational tolerances) to those of the other System or Total System and **Synchronise** and **Synchronisation** will be construed accordingly;

**System**

A Distribution System or a Transmission System, as the context requires;

**System Normalisation Procedures**

The procedures necessary for a recovery from a Partial System Shutdown or Total System Shutdown;

**System Separation**

A situation where following an Incident parts of the Transmission System are out of synchronism with each other;

**Target Frequency**

That Frequency determined by OETC as the desired Frequency of the Total System. This will normally be 50.00 Hz plus or minus 0.05Hz except in exceptional circumstances as determined by OETC;

**Tertiary Reserve**

The component of the Operating Reserve that would be Available as a result of Emergency Instructions to Synchronise and Dispatch other CDGensets;

**Total System**

The entire interconnected electricity Systems of Licensees in Oman, including all Production Facilities and all Transmission Systems and Distribution Systems, as the same may be developed or modified from time to time and includes any such System which interconnects with any System which is outside Oman;

**Total System Shutdown**

The situation when all Generation Connected to the Total System has ceased and the Total System has ceased to function;

**OETC**

The Oman Electricity Transmission Company SAOC established pursuant to Article (6), of the Sector Law; (*Referred as Transco in some documents*)

**Transmission**

Means, in relation to electricity, the transport of electricity by means of a Transmission System, and **Transmit** shall be construed accordingly;

**Transmission Licence**

A Licence to Transmit electricity;

**Transmission Security Standard**

The standards as set down in the Condition 28 of the Transmission Licence and to which the Transmission System will be developed, Operated and maintained;

**Transmission System**

A System for the transport of electricity, which System consists (wholly or mainly) of High Voltage Electric Lines and Electric Plant (namely, Electric Lines and Electric Plant with a nominal voltage equal to or greater than 132kV) and which is used for transporting electricity from a Production Facility to a sub-station, from one Production Facility to another, from one sub-station to another or to or from any Interconnector, Premises, or Distribution System and any Electric Plant used for the purposes of Dispatch;

**Transmission System Outage Plan**

The Outage schedule for the Operational Year produced by OETC in accordance with the provisions of OC 2 regarding outages of Plant and/or Electric Lines of the Transmission System;

**Transmission Use of System Charges**

Charges made by OETC for the use of the Transmission System determined in accordance with the Transmission Licence;

**Turbine Speed Controller**

Any control device that is provided to govern the turbine output according to set values (speed control, power control, extraction flow control, temperature limitation control, etc.);

**Unconstrained Schedule**

A Generation Schedule and Desalination Schedule produced by OETC that does not take account of any limits on the Total System imposed by the Transmission System and as described in SDC 1.4.9;

**User**

A term used to refer to Persons using the Transmission System including all Power Producers having CDGensets, all Internally Interconnected Parties and International Interconnected Parties Connected to the Transmission System, Licensed Distributors and all Directly Connected Consumers. In some instances, this term means any Person to whom the Grid Code applies;

**Voltage Control**

The process of regulation of System voltages to maintain them within specified limits;

**Warm**

When referring to a Genset, it means a Genset that has been shut down for more than eight (8) hours but not more than forty-eight (48) hours if the Genset is in combined cycle configuration and more than two (2) hours but not more than twenty four (24) hours after such Genset has been shut down if the Genset is in open cycle configuration;

**Water Delivery Point**

The point at the boundary of the Production Facility at which Desalinated water is delivered in accordance with PWPAs and by reference to which the Desalinated water flow is measured;

**Water Meter**

A device for measuring and recording water quantities;

**Water Meter Registration System**

The central database operated and maintained by the PWP for the purposes of registering all Water Metering Systems

**Water Metering System**

The group of equipment including Meters, time switches, initiating devices, protection and isolation equipment including alarms, circuitry, associated data storage and data communications equipment that are part of the water quantity measuring equipment at or relating to a Connection Site;

**Winter Downtime**

In respect of a CDGenset or Desalination Unit, those hours of the Winter Period where the availability of the respective CD Genset or Desalination Unit is not affected by an outage and for which no Dispatch Instruction will be given nor Capacity payments will be made; and

**Winter Period**

The period commencing 00:00 on 1 October in a Gregorian calendar year and ending at 24:00 on 31 March in the following Gregorian calendar year;