



مكتب التنظيم والرقابة
Regulation & Supervision Bureau

Regulation & Supervision Bureau

Water, Wastewater and Electricity Sector

Emirate of Abu Dhabi

The Electricity Supply Regulations 2007

Regulation

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The Electricity Supply Regulations 2007

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1. General

1.1 Citation and commencement

1.1.1 These Regulations shall be cited as the Electricity Supply Regulations 2007.

1.1.2 These Regulations shall come into force on 1 January 2008.

1.1.3 These Regulations are issued by the Regulation & Supervision Bureau through the powers vested in it under Article 62 of Law No (2) of 1998 (including amendments and re-enactments thereof).

1.2 Scope, enforcement and disputes

1.2.1 These Regulations shall apply to all Licensed Distribution Companies operating a public distribution network. These Regulations also apply to Customers, property Owners and Licensed Contractors with respect to equipment provided at the Connection Point in any Premises. The detailed requirements relating to Electrical Installations within Premises are given in the Electricity Wiring Regulations 2007.

1.2.2 Compliance with these Regulations shall be assessed in accordance with specifications and guidelines issued by the Bureau from time to time, or issued by Distribution Companies and approved by the Bureau (see relevant documents under 1.3).

1.2.3 Failure to comply with these Regulations, or any part thereof, shall be deemed as contrary to the Law. Such failures will be addressed in accordance with Article 65(5) (notices served by the Bureau), Article 66 (failure to comply and imposition of a fine) and Article 135 (offences and fines) of the Law. Action may be taken against any Distribution Company, Customer, Owner or other person to which these Regulations apply.

1.2.4 Relaxation of any of the requirements of these Regulations shall be approved by the Bureau upon written request from any Distribution Company, Customer, property Owner or other person.

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1.3 Relevant documents

- 1.3.1 *The Electricity Wiring Regulations 2007*: this document covers detailed requirements and guidelines for Electrical Installations within Premises, issued by the Bureau.
- 1.3.2 *The Electricity Distribution Code*: covers requirements for the development, operation and maintenance of distribution networks owned and operated by Licensed Distribution Companies.
- 1.3.3 *Electricity Distribution Licences*: define the responsibilities and scope of operation of Distribution Companies, including their obligations to Customers, issued by the Bureau.
- 1.3.4 *The Incident Reporting Regulations 2001*: specify the obligations on Distribution Companies for the reporting of major incidents in the public supply system, issued by the Bureau.
- 1.3.5 *The Customer Metering Regulations 2005*: specify the operating codes and requirements for meters connected to Customers receiving electricity supply from any Distribution Company, issued by the Bureau.
- 1.3.6 *Distribution Company Standards*: give details of requirements, standards and operating procedures for activities of the Licensed Distribution Companies, including plant and equipment specifications. These are issued by the Distribution Companies and, where appropriate, are approved by the Bureau.
- 1.3.7 *International Standards*: where appropriate these may be referenced or adopted by Licensed Distribution Companies or by the Bureau. These may include, but are not limited to, British Standards (BS), IEC Standards (International Electrotechnical Commission) or ISO Standards (International Standardisation Organisation).
- 1.3.8 *UAE Standards*: issued by the Emirates Standardisation and Metrology Authority (ESMA). These standards may be referenced where appropriate.
- 1.3.9 *Distribution Company Safety Rules*: these define safe procedures for work on Distribution Companies' systems, including at the interface with Customers' Installations.

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2. Definitions

2.1 Interpretation

Words which are defined under this section are used in the Regulations beginning with capital letters e.g. “all Electrical Installations within a Premises shall be ...”.

Words and expressions other than those described in this section, which are defined in the Law shall have the meanings ascribed to them in the Law.

Words using the singular or plural number also include the plural or singular number, respectively.

2.1.1 **Appliance:** an item of current using equipment

2.1.2 **Bureau:** means the Regulation & Supervision Bureau for the Water, Wastewater and Electricity Sector in the Emirate of Abu Dhabi, as established under the Law.

2.1.3 **Customer:** means any person, corporate body, or company who has an agreement with a Distribution Company for the supply of electricity.

2.1.4 **Customer Connection Point (CCP):** the point which defines the boundary between the Customer’s Installation and that of the Distribution Company. This point will normally be at the incoming cable of the main distribution board and before the main circuit breaker. In special cases an alternative definition of the Connection Point may be agreed between the Customer and the Distribution Company.

2.1.5 **Danger:** risk of injury to people or animals from fire, electric shock, burns, explosion or from mechanical movement of electrically controlled equipment, or the risk of damage to property.

2.1.6 **Distribution Company:** a person authorised pursuant to the Law to carry on distribution of water or electricity..

2.1.7 **Earth:** the conductive mass of earth, whose electrical potential (voltage) at any point is conventionally taken as zero.

- 2.1.8 **Earthing or Earthed:** a general term used to describe the connection of metallic parts of Electrical Apparatus or Appliances to Earth.
- 2.1.9 **Earth Electrode:** a conductor or group of conductors in intimate contact with Earth, providing an electrical connection to Earth, and normally having a known and measurable value of Earth Resistance (may also be known outside these Regulations as ‘earth rod’, or ‘grounding rod’.)
- 2.1.10 **Earth Resistance:** the resistance (in Ohms) from any point on an Installation to Earth, being measured using an approved testing device and approved procedure.
- 2.1.11 **Electrical Apparatus:** a general term used in these Regulations which means any cable, line, circuit or sub-circuit, switchgear, transformer, etc within a distribution network or any part of an Electrical Installation within a Premises.
- 2.1.12 **Electrical Installation (abbrv: Installation):** an Electrical Installation generally comprises any fixed or temporary cable, switchgear, transformer or other electrical equipment or apparatus within a Premises or other place where there is an electricity supply (including outdoor locations). Appliances are not considered to be part of the Electrical Installation.
- 2.1.13 **HV (high voltage):** an a.c. voltage greater than Low Voltage and less than 36 kV between phases or 21 kV between any phase and Earth (internationally referred to as Medium Voltage).
- 2.1.14 **Law:** means Law No (2) of 1998 Concerning the Regulation of the Water, Wastewater and Electricity Sector (as amended by Law No (19) of 2007).
- 2.1.15 **Licence:** means a licence issued by the Bureau authorising the distribution, generation, supply or transmission of electricity as described in the Law (part 6).
- 2.1.16 **Licensed Contractor:** a company which has been assessed by the Distribution Company as competent to work on Electrical Installations and issued a Competency Licence.

- 2.1.17 **LV (low voltage):** an a.c. voltage below 1000 V between phases, or below 600 V between any phase and Earth, or a d.c. voltage below 1500 V between conductors, or below 900 V between any conductor and earth.
- 2.1.18 **Main Earth Terminal (MET):** the main connection point at which the nominal value of Earth Resistance for an installation is taken, and to which Earth Electrodes or the Distribution Company Earth are connected. This will normally be at or close to the Customer Connection Point. The Main Earth Terminal may also be known as the ‘main earth bar’.
- 2.1.19 **Owner:** the legal owner of a building or property in which an Electrical Installation is installed and connected to a supply of electricity. In some cases an Owner may also be a Customer.
- 2.1.20 **Premises:** any occupied or unoccupied building or enclosure or other place where there is an electricity supply. Such locations would include, but are not limited to, domestic premises, commercial premises, industrial premises, public buildings, parks, farms, temporary supplies, construction sites, wedding tents, outbuildings, caravans, street lighting and traffic signs.
- 2.1.21 **Prospective Fault Current:** the value of current that would flow due to a short-circuit fault of negligible impedance between live phase conductors, or between phase conductors and Earth, also known as ‘fault level’. The maximum Prospective Fault Current for an installation is normally taken at the Customer Connection Point.
- 2.1.22 **Supply Intake:** a term used to describe the location or room housing the main cable and equipment provided by a Distribution Company to provision a supply of electricity to a Premises (includes the Customer Connection Point).

3. Electricity Supply Parameters

3.1 Declared voltage & frequency

- 3.1.1 The declared supply voltage provided to Customers connected at LV shall be 230 V single-phase or 400 V three-phase.
- 3.1.2 The permissible variation of the supply voltage shall be kept within +10% and -6% of the declared supply voltage.
- 3.1.3 The declared supply frequency provided to Customers shall be 50 Hz.
- 3.1.4 The permissible variation of supply frequency shall be +/- 0.1% (i.e. +/- 0.05 Hz).
- 3.1.5 For Customers supplied at voltages above LV the permitted variation of supply voltage shall be +/- 10% and the permitted variation of frequency shall be +/- 0.1%.

3.2 Harmonics, voltage disturbances and power factor

- 3.2.1 Customers' Installations, and the use of electrical equipment therein, must be designed to avoid the generation of disturbances in the electricity supply, such as voltage fluctuations, voltage dips, voltage unbalance and harmonics, which are of a magnitude that adversely affect other Customers.
- 3.2.2 The permitted limits of such disturbances are given in the Electricity Distribution Code, Annex 1. Customers will be required to install filters or other equipment to mitigate against such disturbances that are outside the permitted limits (as explained in the Electricity Distribution Code).
- 3.2.3 The power factor at the Connection Point between the Distribution Company and the Customer's Installation must be maintained at 0.9 lagging or higher. Power factor correction equipment must be used where required to achieve this value (see the Electricity Wiring Regulations 2007 - Chapter 10).

3.3 Prospective fault current

3.3.1 The maximum three-phase Prospective Fault Current (fault level) for LV supplies shall be 46kA (1 second) at the LV busbar of the Distribution Company's HV/LV substation, or 30kA (1 second) at a LV feeder pillar, or 25 kA (1 second) at a LV service turret.

3.3.2 The maximum 3 phase Prospective Fault Current for HV supplies shall be 31.5kA (for 3 seconds) or such lower value as otherwise agreed between the Distribution Company and the Customer.

3.4 Earthing system

3.4.1 Customers shall be provided with a supply operating under either of the following earthing systems:

- (a) *Customer Earthed System (TT)*: the Customer provides a Main Earth Terminal for the Installation, which is connected to a sufficient number of local Earth Electrodes to provide a maximum Earth Resistance measured at the Customer's Main Earth Terminal of no greater than 10 Ohms (referred to as a 'TT' system);
- (b) *Distribution Company Earthed System (TN-S)*: the Distribution Company provides a connection to the Customer's Main Earth Terminal, using the distribution network Earthing system, via the armouring or metallic sheath of the incoming supply cable (referred to as a TN-S system). The Distribution Company system is earthed at the distribution transformer (11 kV / 400 V) and separate earth and neutral conductors are used throughout the distribution network; or,
- (c) *Distribution Company Earthed System with additional Customer Earth (TN-S-TT)*: the Distribution Company provides an earth connection to the Customer's Main Earth Terminal and a local Earth provided by the Customer is also connected to the same MET, having an Earth Resistance value of no greater than 10 Ohms.

3.4.2 These types of earthing systems and their associated requirements are explained in the Electricity Wiring Regulations 2007.

3.4.3 The preferred type of earthing system to be used in Abu Dhabi Emirate is TN-S-TT. However, either TN-S or TT systems may be used where agreed between the Distribution Company and the Customer. The type of earthing system must be clearly labelled at the Supply Intake.

3.5 Interruptions of supply

3.5.1 Distribution Companies are required to report to the Bureau interruptions of supply to customers, as well as other system incidents, in accordance with procedures defined by the Bureau.

3.5.2 The Distribution Company shall operate its network so as to minimise interruptions of supply to Customers. Specific standards of performance for Distribution Companies shall be set by the Bureau, including the average frequency and duration of interruptions and the maximum times for restoration of supply.

3.5.3 The Distribution Company shall have a right to interrupt the supply to Customers, without prior notice, in the event of an emergency (for example, in the case of fire, or other risk to life).

3.5.4 Where the Distribution Company has a reasonable need for a pre-planned interruption of supply to one or more Customers (e.g. for essential network maintenance) it shall give notice of at least two working days to the affected Customers. Such interruptions shall be arranged to take place at a reasonable time of day.

4. Requirements for Electrical Apparatus

4.1 General Requirements for Safety

- 4.1.1 All Electrical Apparatus shall be constructed, installed and maintained so as to prevent danger so far as is reasonably practicable.
- 4.1.2 All Electrical Apparatus shall be sufficiently sized and rated to safely carry out the function for which it is required.
- 4.1.3 All Electrical Apparatus shall be insulated appropriate to the function it serves, in consideration of the expected operating environment, so as to prevent danger so far as is reasonable practicable.
- 4.1.4 All Electrical Apparatus which is constructed of metallic or conducting material, or comprises significant metallic or conducting parts, which may come into contact with persons, shall be Earthed so as to prevent the occurrence of a sustained voltage on such parts.
- 4.1.5 All Electrical Apparatus shall be protected against damage due to excess current (caused by a fault or overload) by suitable protective devices such as fuses, circuit breakers or other device.
- 4.1.6 All Electrical Apparatus must be suitably located so as to provide safe access for operation, maintenance and repair and must be protected against accidental or deliberate interference or damage.
- 4.1.7 All Electrical Apparatus shall be suitably labelled so as to give information on its basic operating parameters, its source of supply, location in relation to other Apparatus, and any precautions that should be taken. Where Apparatus is accessible or visible to the general public it should be labelled with a warning: "LIVE – 400 VOLTS – DANGER OF DEATH" or similar wording in prominent letters. This warning should be written in English and Arabic. However, points of normal use for Appliance

may be exempt from this requirements (see the Electricity Wiring Regulations 2007 – section 3.6).

4.2 Distribution Company Apparatus

- 4.2.1 The Distribution Company must safeguard its staff, other workers, and the general public, from its Electrical Apparatus when in normal use and under all other reasonably foreseeable circumstances.
- 4.2.2 The Distribution Company must operate its equipment according to its approved System Safety Rules.
- 4.2.3 Electrical Apparatus must be adequately maintained and inspected at appropriate intervals. Relevant procedures must be defined in Distribution Company operation and maintenance policies which will be made available to the Bureau on request.
- 4.2.4 Any electric cable buried in the public road, footway or other public area shall be installed at a minimum depth of 0.6 m for LV and 0.75 m for HV. Such cables must have a buried marker and or protective tile installed 0.1 m above the cable position.
- 4.2.5 All buried cables shall be constructed to include a metallic screen which shall serve the function of an electromagnetic shield and which may also be used for the purpose of earthing.
- 4.2.6 Overhead lines shall be installed at an adequate height so as to prevent Danger. As a minimum, the height of overhead lines for LV will be 6 m and for HV will be 7.5 m. Poles, towers and supports for overhead lines will be marked with a warning label.
- 4.2.7 The Distribution Company shall keep adequate and up-to-date records of all its Electrical Apparatus and provide drawings and other relevant information to any Customer or other person upon reasonable request.
- 4.2.8 The Distribution Company shall publish relevant specifications and standards for all its Electrical Apparatus and provide these upon reasonable request to any Customer or person. These standards will cover the design, installation, construction, testing and maintenance of Electrical Apparatus.

4.3 Customer's Installations

- 4.3.1 The Distribution Company shall install suitable connection equipment in order to provide supply to any new Customer or Owner upon reasonable request, and make a reasonable charge. The basis of such charges shall be approved by the Bureau.
- 4.3.2 The Customer's Installation must meet the requirements of the Electricity Wiring Regulations 2007 before a supply is provided by the Distribution Company.
- 4.3.3 The Customer Connection equipment shall be clearly marked and metering equipment shall be security sealed.
- 4.3.4 Any work or testing on the Customer's Installation may only be carried out by a Licensed Contractor or the Distribution Company.
- 4.3.5 Detailed requirements for the design, construction and testing of Customer's Installations are given in the Electricity Wiring Regulations 2007.