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Distribution Code



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Introduction

The creation of the Distribution Code as a legal obligation was prepared by the DSO and the TSO and approved by the Regulator in year 2008. During year 2014 the DSO updated the code to adapt to changes in the electricity sector. Following the legislative changes in years 2016/2017, based on laws 05/L-84, 05/L-81 and 05/L-85, the DSO has consequently updated the distribution code to harmonize it with the new legislative changes. This is third version of Distribution Code.

The Law on Electricity obliges the DSO to draft and regularly review the Distribution Network Code for its system, in appropriate consultation with the operators of other systems, with which it is connected and, with possible changes, submits them for approval to the Regulator

Law on Energy No. 05/L-81, defines the Codes as rules foreseen for the establishment of the minimum technical design, operating conditions and standards, and commercial conditions for relevant activities in the energy sector, for which the law requires to be submitted to the Regulator for approval;

The distribution network code is based on objective principles, non-discriminatory and interoperable with other systems and operates based on these principles. The distribution network code contains, among other things, issues that the Regulator may specify, which include:

- minimum rules for the development and operation of the distribution system, including the obligations for the maintenance of the appropriate level of security system and reserve capacity
- technical rules that define the minimum criteria for technical and operational design for connection to the transmission and interconnection system, as well as the operation of other systems
- procedures applicable to system operators in emergency situations



Structure of Distribution Code

Distribution Code is divided into chapters named as follows:

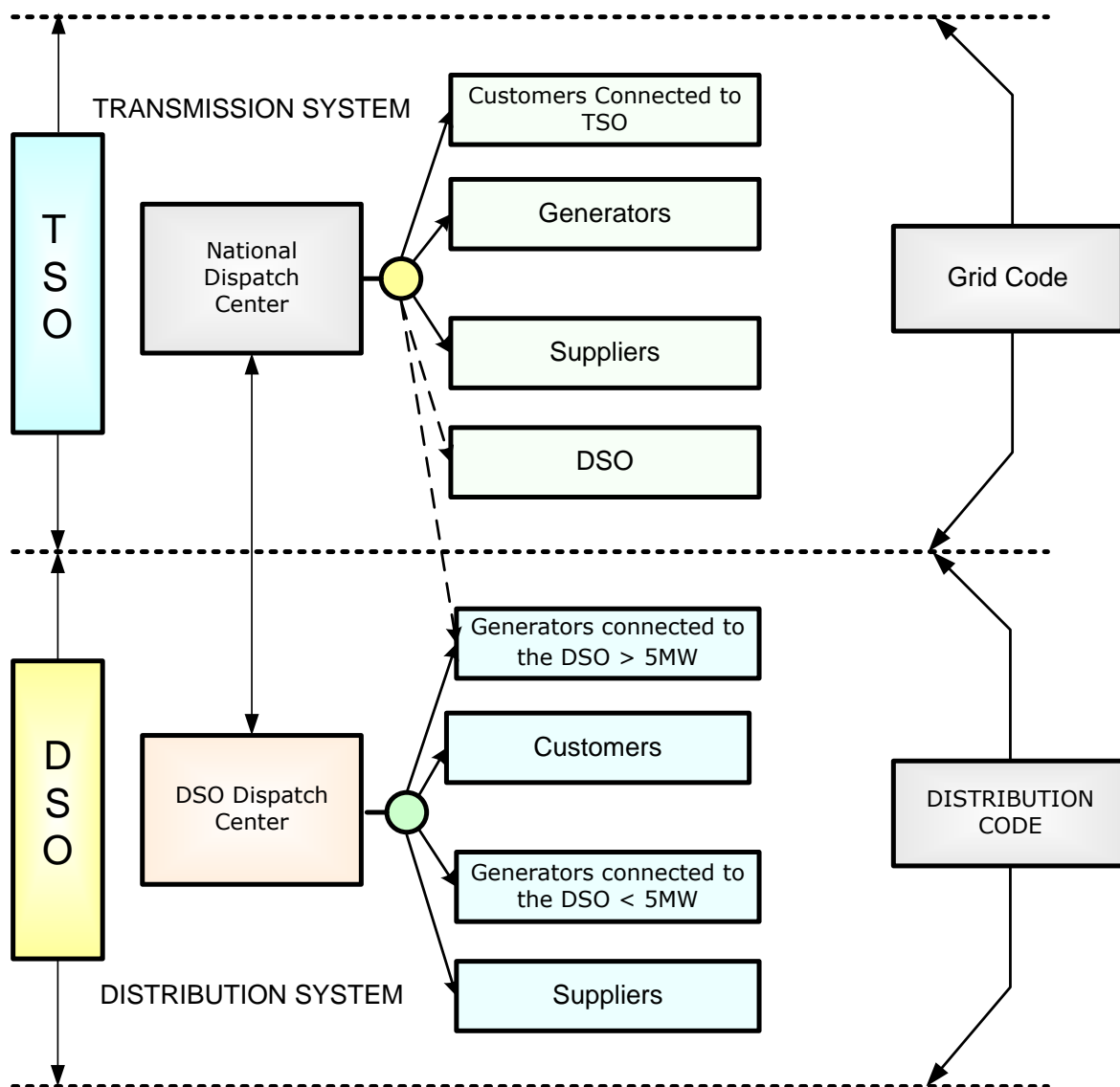
- ❖ Chapter 1 - Introduction
- ❖ Chapter 2 - General Distribution Conditions (GDC) define the legal framework for conducting work with the Distribution Code
- ❖ Chapter 3 - Distribution System Planning (DSP) contains details of the supply standard provided, as well as the design principles according to which the Distribution System is built. DSP enables Users to obtain certain information from the DSO for the Distribution System in certain circumstances
- ❖ Chapter 4 - Distribution System Connection Conditions (KKSSh) provide details of technical and other requirements that must be met by those requesting a connection in Distribution System. The specific conditions which apply / belong to independent producers connected to the Distribution System are also included in 4.6.3
- ❖ Chapter 5 - Distribution System Operation (DSO) addresses various operational issues that have an impact on the user, such as providing load



forecasting, Distribution System outage planning, generation outages, Transmission System outages, reporting of changing operations and events, security issues as well as procedures for dealing with emergency situations.

- ❖ Chapter 6 - Technical Data Register (RDhT) summarizes in table form all the data required in the Distribution Code.
- ❖ Chapter 7 - Determination of Terms and Definitions

Links between the Network Code (of TSO) and the Distribution Code (of DSO), implementation and classification according to prioritization are shown in the figure below:





Chapter I

1. *Introduction*

1.1 Structure of electro energy system (SEE)

- 1.1.1.** The Transmission System Operator (TSO) develops and operates the Transmission System. The Transmission System transmits the electricity generated by the Production and Interconnection Units to the customers directly connected to the Transmission (110 kV, 220 kV, etc.) to the connection point and to the exchange point with the Distribution System, through which the end customers are supplied
- 1.1.2.** The owner of the **Transmission System** Assets is the **Transmission System Operator** (TSO)
- 1.1.3.** The Distribution System Operator (DSO) is responsible for the operation, maintenance, as needed, development of the distribution system, and where possible its interconnectors with other systems, as well as for ensuring the long-term ability of the system to cover the reasonable requirements for electricity distribution. The Distribution System carries and distributes electricity from the Transmission System or from independent Generating Units up to final (end) customers
- 1.1.4.** The Supplier is responsible for supplying electricity to the End Customers. For this purpose, Suppliers will have the opportunity to use the Transmission System and Distribution System for the transmission of electricity from Generation Units to Final (end) Customers



- 1.1.5.** Producers that produce electricity which is sent to the Transmission or Distribution System depending on their capacity and level of connection. Producers are classified according to their voltage, output power, connection place as well as based on whether or not they are subject to the rules of the National Dispatch Center QND of the TSO or Dispatch Center of Distribution QDSH of the DSO.
- 1.1.6.** Consumers are end consumers of electricity who buy electricity for their own use
- 1.1.7.** Producing consumer - is the consumer of electricity who at the same time and in the same location is the owner of the micro-generator of RES, connected to the network and with the right of self-consumption of the generated electricity as well as the delivery of surplus electricity generated at the supplier

1.2 Distribution Code

- 1.2.1** The Distribution Code has been prepared by the DSO, in accordance with the Laws and Regulations in force such as the Law on Energy, the Law on Electricity, the Law on the Energy Regulator and other rules and bylaws on electricity, based also on relevant standards
- 1.2.2** The Distribution Code defines all technical aspects of interconnections and relations between the DSO and all Distribution System Users, to ensure an efficiency, coordination and a stable - economic system for electricity distribution. This Code also enables the DSO to comply with the responsibilities arising from the Distribution System Operator License and the Network and Metering Code of the TSO



- 1.2.3** Users connected to the Distribution System must comply with the relevant provisions of the Distribution Code. Distribution network users (customers and producers) are also required to sign the Connection Agreement and other relevant agreements (as example such as energy supply contracts from suppliers). In the name of customers Suppliers might also sign the Connection Agreement and also the agreement of the distribution network use with the DSO.
- 1.2.4** Users are obliged to comply with the criteria of these documents as appropriate to their circumstances

1.3 Use of the Distribution System

- 1.3.1** Use of the Distribution **System** may involve any of the following activities:
- a. A **connection** at entry or exit from the **Distribution System**. An entry point is the **connection** between the **Distribution System** and **Transmission System** or of **Generating Units**. An exit point is the **connection** between the **Distribution System** and the **Customer's** connection place
 - b. Use of the **Distribution System** for carrying the electricity between entry and exit points
 - c. Construction of a **Connection Point**
 - d. Work or operation associated with equipment at the interlink points with **Distribution System**.



Chapter II

2. Distribution General Conditions

2.1 Introduction

2.1.1 Whilst each chapter in the **Distribution Code** contains the rules and provisions relating to **Distribution General Conditions**, there are provisions which are of more general application. These are covered in the Distribution General Condition

2.2 Objective

2.2.1 The General Conditions of Distribution contain provisions which are for general application to all provisions of the Distribution Code. Their objective is to ensure, as far as possible, the consistent application of the various paragraphs of the Distribution Code to all Electricity Users

2.3 Scope

2.3.1 **Distribution General Conditions** apply to all **Users**



2.4 Assistance in Implementation

- 2.4.1** Distribution System Operator License obliges the DSO to implement and oblige the Users to implement the Distribution Code. To achieve this, the DSO would need to: access across separate - connection boundaries (ownership boundaries), User services and equipment, or issue instructions to Users, for example to isolate or disconnect the plant / facility or equipment his. It is considered that these rules will be specific to each case and therefore it is not possible to predict accurately or comprehensively what the DSO will reasonably require from the Users in order to proceed with the performance of own tasks in the implementation and enforcement of the Distribution Code
- 2.4.2** All Users are required to comply with the terms of the Distribution Code and also to ensure the right of access, services, equipment for the DSO and to comply with the instructions received, so that reasonable may be required by the DSO to implement the Distribution Code.

2.5 Unforeseen Circumstances

- 2.5.1** If circumstances arise which are not foreseen for in the provisions of the Distribution Code, then the DSO to the extent possible, reasonable, practical for such circumstances, immediately and in good faith will consult the Users affected by the circumstances presented , trying to reach agreement on what to do. If agreement cannot be reached within the optimal time, the DSO will determine what to do
- 2.5.2** Whenever the DSO makes a decision, it shall consider any situation with views expressed by the Users to the extent that is reasonable in all circumstances. The DSO will notify the Regulator and the relevant Ministry of the actions taken



2.5.3 Each User must act in accordance with all instructions given to him by the DSO, implementing such a decision so that the instructions are in accordance with the technical parameters registered in the Distribution Code, given for a separate User system. The DSO will accurately forward all unpredictable circumstances and will forward any such decision to the KQKO in accordance with Article 2.7 of this Code

2.6 Hierarchy

2.6.1 In the event of any conflict between the provisions of an **KQKO** decision on the one hand and the provisions of the Distribution Code on the other, the provisions of such an **KQKO** Decision shall prevail.

2.6.2 In the event of any conflict between the terms of the Distribution Code and of any contract, agreement or arrangement between the DSO and the User, the provisions of the Distribution Code shall prevail unless the Distribution Code expressly / clearly foresees various other forms

2.7 Review of Distribution Code

2.7.1 The Distribution Code sets out the conditions which must be applied by all parties. The revision of the Distribution Code will be undertaken by the Governing Commission of Operational Codes (**KQKO**) according to the "Rule on Governance Procedures for Technical / Operational Codes" approved by the Regulator. The DSO will take responsibility for the inclusion of amendments (changes) agreed by the **KQKO** and approved by the Regulator as well as for the issuance in circulation of the amended (changed) code

2.7.2 The DSO must submit proposed amendments to the **KQKO** Distribution Code for discussion, regardless of which party proposes such amendments



2.7.3 The DSO must from time to time or by request of the Commission established by the **KQKO**, taking into account its recommendations, submit the improved code from side of KQKO for approval to the Regulator.

2.8 Communications between DSO and Users

2.8.1 With exclusion of cases when otherwise specified in the Distribution Code, working communication methods and data transfer shall be regulated from time to time, by agreement between the DSO and the Users

2.9 Emergency Situations

2.9.1 Users must be informed that the provisions of the Distribution Code may be suspended, in whole or in part, in accordance with the instructions given and / or orders made by the relevant Ministries of the Republic of Kosovo in accordance with the Primary Energy Laws

2.10 Responsibilities according to Code

2.10.1 The Distribution Code sets out the procedures and principles governing the relationship between the DSO and all Distribution System Users

2.11 Derogations

2.11.1 If any User notices that it is not in compliance and will not be able to comply with the provisions of the Distribution Code, then without any delay the User must report it to the DSO. In accordance with the provisions of 2.11.2 reasonable efforts must be made to avoid this discrepancy, possible as fast / soon as and practically



2.11.2 Cases when the discrepancy is:

- a. related to the plant (facility) and equipment connected to the Distribution System is caused solely or mainly as a result of a revision of the Distribution Code; or
- b. in connection with the Facility and / or equipment that are connected, the connection is approved, or approval for connection to the Distribution System is required and the User thinks that any of these would be unreasonable (including cost and technical considerations) to request the correction of such a discrepancy, or in cases where an extension of the time limit / deadline for the correction of a discrepancy given in the Distribution Code should be allowed

2.11.3 As soon as a party notices that it is unable to fulfill one or more provisions of the DSO Distribution Code then the user must immediately inform the DSO and DSO request a derogation for the relevant provisions in ERO

2.11.4 Request for derogation for some provision of Distribution Code must contain:

- a. the number of the article (provision) of the appointment / naming in the Distribution Code, against which the non-compliance of the provision has been identified or foreseen;
- b. identification of the plant (facility) and / or equipment in relation to which the derogation was requested, if relevant, the nature and extent in which exist discrepancy;
- c. identifying the provision with which the User is not, or will not be able to comply;
- d. the reason for the discrepancy; and



e. the date on which compliance will be achieved (if non-compliance improvements are possible) subject to 2.11.2 (b).

2.11.5 If the DSO determines that it is not, or will not be, able to act in comply with any provision of the Distribution Code, then it shall make reasonable efforts (as required) under the provisions of 2.11 to improve such a discrepancy according to the dynamics presented by the DSO.

2.11.6 Monitoring of compliance and non-compliance with the requirements of the Distribution Code by users is done by the DSO

2.11.7 In case the DSO requests a derogation, then the DSO must submit to the Regulator the information presented in points foreseen earlier of this article

2.11.8 Upon receipt of any request for derogation, the Regulator shall immediately consider such a request provided that it considers that the grounds for derogation are reasonable. The Regulator shall allow such a derogation unless the derogation has or is expected to have an adverse material impact on the security and stability of the Distribution System, or imposes unreasonable costs on the operation of the Distribution System, the Transmission System or to other Users. In consideration of the User request for derogation, the Regulator may contact the relevant User and the DSO to ensure clarification of the request and to discuss changes in the request. If the derogation has any impact on the Transmission System, the DSO must first / in advance act in conjunction with the TSO before providing an assessment to the Regulator

2.11.9. Depending on the extent to which any derogation is permitted in accordance with 2.11, the DSO and / or the User (as the case may be) will be relieved of their obligations to act in compliance with the provisions applicable to the Distribution Code, and will not have any obligation for failure to comply with any alternative provision as set forth in the derogation

2.11.12 DSO is obliged that in relation to derogations to:



- a. keep a record of all derogations received, the identification of the person on whose behalf the derogation was received, the relevant provision of the Distribution Code and the derogation period; and
- b. at the request of any User, provide a copy of such register of derogations to the relevant User

2.12 Disputes (disagreements)

2.12.1 In the event of any dispute between Distribution System Users and the DSO, the dispute shall be settled subject to the Rules for the Settlement of Complaints and Disputes in the Energy Sector approved by the Regulator. In case of discrepancy between the provisions of this Code and other bylaw acts adopted by the Regulator, the latter shall decide on the provisions to be used

2.13 Administrator of Code

2.13.1 The DSO shall act as the code administrator and as such shall undertake all functions detailed in the rules below in a professional manner, within a specified time deadline and in a non-discriminatory manner to all Users

2.13.2 The functions of the code administrator will include the following:

- Maintaining the main updated copy of the Distribution Code ensuring that all approved revisions are included on it
- Publication (announcement) of the current approved version on the official website;
- Publication (announcement) of the proposed changes on the official website (for consultations);
- Publication (announcement) of approved changes on the official website



- Written information to all Users about this information; that there have been changes proposed, approved or new versions of the Distribution Code can be found on the official website

Chapter III

3. Planning of Distribution System

3.1. Description of Planning

3.1.1. According to the Law on Energy, every year, the Electricity Distribution System Operator submits to the Energy Regulatory Office a ten (10) year plan for network development based on current demand and supply and foreseen after consultation with all relevant stakeholders. The network development plan contains efficient measures in order to guarantee system suitability and security of supply.

3.1.2. The Law on Electricity states that the 5-year development plan, which must contain all investments that are under development and identify new investments that will be realized during the next five (5) years, is in line (harmony) with the 10-year development plan.

The 10-year network development plan is monitored and evaluated by the Energy Regulator in accordance with the Law on Energy, and it must be in accordance with the implementation program of the Strategy. Network development plans should be published on the website of the Energy Regulator and on the website of the DSO

3.1.3. According to the Law on Electricity, the development of ten (10) year plans of the DSO must be in harmony with the ten (10) year development plan of the transmission network, which must be approved by the Regulator



- 3.1.4.** The Law on Electricity states that the development of the five (5) year plan and the one (1) year investment plan for the development of the distribution network must be in accordance with the ten (10) year plan for the development of the distribution network, with the documentation of spatial planning and with the five (5) year development plan of the transmission network, which must be approved by the Regulator. The Distribution System Operator provides information to local government units on their needs for the development of local development plans while respecting the confidentiality of data of individual network users.
- 3.1.5.** According to the License for DSO, the Distribution System Operator is obliged to draft 10 and 5 year development plans as well as a 1 year investment plan in accordance with the legislation in force. The DSO will review the long-term development plan every year, so that the information presented in the development plan continues to be accurate in all material aspects. Eventual proposals for supplementing or changing the development plan will be submitted to the Regulator for approval
- 3.1.6.** Distribution System Planning specifies the technical and design criteria as well as the procedures to be undertaken by the DSO in Distribution System Planning and Development. These principles and requirements also apply to Users for the planning and development of their installations to the extent that it has an impact on the Distribution System
- 3.1.7.** Users requests may affect the strengthening or expansion of the Distribution and Transmission System, respectively the strengthening or expansion of the interconnection capacity of the DSO and the TSO, therefore such a request must be identified in a required time and manner by the DSO
- 3.1.8.** The time required for the planning and development of the Distribution System and any significant (important) development which is related to the Transmission



System, will depend on the type and necessary support measure and the dynamics of the works, the time required for obtaining planning permits , including any possible verbal discussion and the degree of complexity of undertaking new work, while the security and satisfactory quality of supply is being maintained.

3.1.9. The reference made in Distribution System Planning will serve as information or advice to the DSO and Users. For the avoidance of doubt, unless otherwise requested by the context, such information or advice should be provided by the DSO as soon as possible taking into account the User request (either during the connection application process or prior to the creation of the agreement for connection)

3.2. Objectives of Planning

3.2.1. Objectives of Planning of Distribution System are to:

- a. Enables the distribution system to be planned, designed and built so that it operates in the most economical, best and safest way
- b. Facilitate (ease) the use of the Distribution System by Users and specify the standard of quality of service to be provided (offered)
- c. To provide / offer sufficient information for the User to evaluate the connection possibilities and to plan and develop its installation, to be compatible with the Distribution System; and
- d. Unify System Planning data request forms

3.3. The purpose of planning

3.3.1. Distribution System Planning and Development has the following determined goals / purposes:



- a. To draft the perspective development plan of the Distribution System, to be able to distribute electricity in the quantity and quality required by Users
- b. To determine the operation of the Distribution System according to safety conditions, as well as to create security in the distribution of Electricity at the required quality levels
- c. To orient and encourage efficient investments in the Distribution System, through the initiation of the necessary procedures as well as to collect and process the necessary information for the drafting of the system development plan

3.3.2. The users to whom the Distribution System Planning is applied are those who use or intend to use the Distribution System:

- a. All Independent Producers;
- b. All Customers connected to the Distribution System; and
- c. Suppliers

3.3.3. The drafting of the Development Plan for the Distribution System is based on the following data:

- a. load forecasts for each year made by suppliers (including load type diagrams for specific days);
- b. forecast of electricity generation from existing Producers for five (5) years and potential producers known at the time of drafting the plan



- c. the level of security defined in the entire Distribution System and in each node, to comply with the norms in force
- d. Strategy for the development of telecommunications infrastructure for remote monitoring and control, a responsibility which belongs to the DSO

3.4. Criteria of planning

3.4.1. Distribution System development plan will be prepared based on the prospective development study, covering time periods of at least 5 years, respectively 10 years according to law 05_L_085, containing the one (1) year investment plan. The Distribution System development plan takes into account:

- a. safety, stable operation and implementation of standards for quality electricity distribution service;
- b. the use of the capacities of the Distribution System in the economic optimums;
- c. distribution network loss analysis, including technical loss assessment and unauthorized electricity consumption
- d. choosing the development alternative with maximum economic efficiency;
- e. determining the economic operation of the Distribution System in conditions of unstable load;
- f. compliance with safety norms and laws on fire protection and prevention

3.4.2. Distribution System development planning also aims to limit the negative impact caused to the environment, directly or indirectly mainly by the following causes:

- chemical pollution (oil, gas, various refrigerants / cooling mediums, etc.);



- the impact of aggressive environment on the system (humidity, excessive frost, ice, salts, strong winds, turbulent air in vertical currents, etc.);
- forecasting in the planning of measures in natural disasters (earthquakes, floods);
- atmospheric discharges (radioactive, etc.);

3.5. Criteria for Verification of Dimensioning of Distribution System

3.5.1. The verification of the dimensioning of the Distribution System will be performed in accordance with the technical norms in force, taking into account the following three basic criteria for study:

- a. the criteria of thermal and dynamic stability in the short-circuit mode;
- b. the criteria of thermal stability in long-term operation;
- c. economic criteria

3.6. Standards of Design

3.6.1. Frequency

3.6.1.1. System Frequency Regulation is beyond (outside) the control of the DSO, however the standard frequency band is defined in the Network Code. Nominal operating frequency of system and equipment, defined in the value of 50 Hz, $\pm 2\%$; but even for transient cases the tolerable limits are in the values of $+ 3\%$ and -5% , which are described in more detail in the Network Code-Balance Code of the TSO

In connection code of TSO are given standard values of frequency band,

Band of frequency	Time period for operation
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47.5 Hz – 48.5 Hz	30 minutes
48.5 Hz – 49.0 Hz	60 minutes
49.0 Hz – 51.0 Hz	Continuous
51.0 Hz – 51.5 Hz	30 minutes

3.6.2. Voltage

3.6.2.1. The Distribution System includes the network which operates at the following nominal voltages:

Low voltage (LV)	230 V (volt-phase with neutron – phase)
	400 V (volt-phase with phase – linear)
Medium Voltage (MV)	V (6,3 kV) [industrial]
	10,000 V (10 kV)
	20,000V (20 kV)
	35,000V (35 kV)

3.6.2.2. Medium voltage levels are monitored and controlled (regulated) through automatic voltage regulators, HV / MV energy transformers which are owned by the TSO, so the limits allowed by the standards for these voltage levels are under responsibility of the TSO.

3.6.2.3. The DSO shall operate the Distribution System so as to ensure that the voltage across the supply system terminals, as defined in standard IEC 50160 (point 4.3.1 and 4.3.2), complies with this standard. Voltage band tolerance of MV and LV level voltage $\pm 10\%$, in special cases $+10, -15$. The resulting voltage at different points in the system depends on several factors, but at the farthest connection point-technically with customers can be expected to be consistent (in accordance) with the data in the following table, for stable and normal operating conditions



Table of presentation of voltage levels and their maximum fluctuation limits during the system up to the last connection point (minimum voltage point) of the customer

Nominal Voltage	Maximum Voltage (+10%)	Minimum Voltage (for -10%)	Minimum Voltage (for -15%)
230 V	253 V	207 V	195,5 V
400 V	440 V	360 V	340 V
6,3 kV	6,93 kV	5.67kV	5,35 kV
10 kV	11 kV	9 kV	8,5 kV
20 kV	22 kV	18 kV	17 kV
35 kV	38,5 kV	31.5 kV	29,75 kV

3.6.2.4. The Distribution System and any User connection to that system shall be designed to enable the Normal Operating Frequency and supply voltages for customer in accordance with the European standard EN 50160 on the Energy Voltage Characteristics Supplied by the Public Distribution System". The characteristics of voltage, frequency, deviations, obstacles, imbalance and harmonics are also presented in the approved CENELEC standard. It should be taken in consideration that the standard describes the main characteristics of the voltage, which can be expected at supply terminals under normal operating conditions.

3.6.3. Requirements for Independent Generators of Electricity Directly Connected to the Distribution System



- 3.6.3.1.** The Distribution Code applies to all existing or future Independent Producers directly connected to the Distribution System, including Producers with joint production, Self-Producing customers and other producers which use Renewable Energy Sources
- 3.6.3.2.** Producers with stand-by generating units that are connected to the Distribution System, must meet the requirements of the DSO by avoiding parallel operation with the network. These requirements are described and defined in more detail in the Connection Agreement.
- 3.6.3.3.** Producers directly connected to the Distribution System will initiate discussions at an early stage of planning, to allow the DSO to consider / review the impact of the Generating Unit on the Distribution System.
- 3.6.3.4.** The DSO will require the fulfillment of the conditions for the connection of the Production Unit to a point of the Distribution System, request a review of the construction parameters or technical parameters of the Production Unit, or impose some restrictions in order to guarantee the safekeeping of safety and quality of supply standards. In this case, the DSO will provide sufficient explanatory information to justify the fulfillment of the required conditions
- 3.6.3.5.** All Producers directly connected to the Distribution System will provide the DSO with all data and information required by the DSO, according to the deadlines set out in this Distribution Code.
- 3.6.4.** Data required from the applicant for connection to the Distribution System
- 3.6.4.1.** All Applicants who request connection to the Distribution System must provide the DSO with the following data, as well as all data and information required by the DSO according to the deadlines set out in this Code, respectively in Chapter 6:
- a. Annual Active Energy Demand



- b. Annual Reactive Energy Demand
- c. Annual maximum energy demand
- d. Maximum load for each time period
- e. Nominal voltage of the point where the load will be supplied

3.6.5. Criteria for earthlink (grounding)

Neutral treatment is different for different supply voltages. Grounding of a part of the User installation that is connected to the Distribution System, will meet the requirements according to the Distribution Code as well as the technical rules in force. The installation of the Earthing (grounding) of the Distribution System will be in accordance with the technical rules and other legal and sub-legal acts in force. Current treatments for most cases are described below but these may vary from case to case as well as in the future.

Electrical installations of new customers connected to low voltage, will be protected with special electrical conductors with earthing system type TT in accordance with the requirements of National (State) Rules for Electrical Installations - Standardization Agency of the Republic of Kosovo. This requires that the earthing conductors of the individual equipment be connected to the central connection position in the vicinity of the input / entrance supply terminal. No local earthing of facilities or equipment within the installations is allowed.

3.6.5.1. For medium voltages the following earthing of neutral are applied:

Voltage	Neutral treatment
10 kV	Isolated Neutral or Neutral connected via 20 Ω resistor to ground to limit single-phase connection current to earthing



	in value up to 300 A.
20 kV	Neutral connected via 40 Ω resistor to ground to limit single-phase connection current to earthing in value up to 300 A
35 kV	Earthing through a quenching coil of capacitive earth connection currents (serial inductance) at High Voltage substations. The value of $I_{k1} \leq 300$ A can also be used with a resistor

3.6.5.2. With the exception of the LV network where multiple protective earthing is permitted, roads (modes) of sequency of phase with zero multiple in the MV are currently prohibited in the Distribution System design

3.7. Transfer of planning data

3.7.1. Planned information which must be provided from users

3.7.1.1 Distribution System Users shall provide sufficient data / information as can reasonably be expected to be provided when required by the DSO to enable the DSO to act in compliance with the requirements set in the DSO License

3.7.1.2 Distribution System Users (with engaged reactive power over 15 kW) will provide data for planning, for specific time periods in the future; updated as needed on an annual basis and including projected demand forecast needs, forecast changes in maximum demand, or production capacity as required and appropriate as possible. The data and the time duration during which the data are requested are provided in Chapter VII of the Distribution System Technical Data Register and the System Users Technical Data Register.



- 3.7.1.3** In addition to periodic updates of planning information, the User shall provide adequate records / data of any significant / important changes to its system or operating regime to enable the DSO to prepare its development plans and implement any necessary modification to the system. In the event of unplanned changes to the User System or operating regime, the User shall notify the DSO as soon as possible to ensure that any necessary action can be taken which can be implemented
- 3.7.1.4** Users shall provide details of the reactive power compensation of the plant / facility connected to the Distribution System, other than those of Low Voltage (with engaged power below 15 kW) including nominal characteristics and operation control
- 3.7.1.5** Users will be required to provide the DSO with data of details of the interconnection between their system and the Distribution System, covering circuit parameters, circuit breakers and the selection and parameterization of directly connected equipment protections or those affecting the Distribution System, to enable the DSO to access any interconnected circuit intersections at these connection points

3.7.2. Information which must be exchanged

- 3.7.2.1.** The DSO will provide reasonable information required by the Distribution System User on the design and other features (characteristics) of the Distribution System
- 3.7.2.2.** In case the DSO proposes to make certain modifications to its system or when it has received information from the User as above under 3.7.1, which may affect other installations of the User, then the DSO will notify the Users of the proposal by subject to any obligation (content) of confidentiality or time
- 3.7.2.3.** The DSO will provide information with Users Request regarding local network conditions to enable you to determine the protection of their requests



3.7.2.4. When the User installation is connected to the Distribution System bus bars the exchange of sufficient details regarding the User Ownership Limit and the DSO may be required to enable the assessment of temporary overvoltage impacts / influences. The request for information can be initiated by the DSO or the User.

3.7.2.5. Information can be exchanged between the DSO and the User about supply breakdown levels, in supply bus bars or the point of connection to the Distribution System as appropriate, in the form of:

- Information from ground / earth connection and short circuit for single phase short circuit and three phase short circuit
- Report / ratio X/R^{*1} under conditions of breakdown of three phase connection

3.7.2.6. Information between the DSO and the User, regarding the load transfer capacities, when the User loads have alternative supply options. This should include the proportion of load received under normal conditions from each supply point and measures (manual or automatic) for transfer under planned outage conditions or defects

3.7.3. Analyzes of planning

3.7.3.1. In order to facilitate new connections / modified connections in the Distribution System, the DSO will prepare (when required), a request for an analysis which shows the possible implications of any connection at a certain point in the system

3.7.3.2. Under the terms of the DSO License, a reasonable obligation (payment) may be imposed by the DSO for the planning analysis. The details of these payment obligations will be defined in the document on "Methodology of Fees (taxes) for

¹ X/R – Reactance / Omiike Resistance



Connection to the Distribution Network", which will be developed by the DSO and approved by the Regulator as provided in the Rule on General Conditions of Energy Supply.

- 3.7.3.3.** Users or Potential Users will provide the DSO with information regarding the proposed equipment including load details, interconnection arrangements, proposed connection point and Acceptance / Delivery requirement
- 3.7.3.4.** The analyzes will normally be prepared according to the quality standards of the services within 15, 20, respectively 40 days after the date of receipt of the information, or the agreement of the person who made the request to pay the cost of the study. For the cases of Producers or Industrial Consumers who apply for connection, according to the nature and the complexity of the request, this period can be 90 days or even another 30 days from the receipt of planning information by the DSO
- 3.7.3.5.** Details of application procedures for Distribution System Connection are included in the Fee (taxes) Methodology for Connection in Distribution System
- 3.7.3.6.** The rules applied by the DSO in determining the application for connection are defined / determined in the "Standards of Security and Planning of the Distribution System"
- 3.7.3.7.** When such information are available, then DSO shall provide a statement of current and future capacities, forecast of power flows and loading of the part or parts of the Distribution System specified in the request and should include breakdown levels at each Distribution System node included in the request. The DSO may deduct any obligation from the provision of this agreement with the approval of the Regulator based on the reasonable prices set by the DSO for the preparation of this statement



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Chapter IV

4. Technical Conditions of Connection in Distribution System

4.1. Introduction

4.1.1. It is necessary to require the fulfillment of a certain minimum technical, design and operational criteria from the plant / facility and apparatus of the User in order to be maintained to the extent required by Good Industrial Practice (IEC or SKEN Standards) for operation stable and secure of Distribution System, for the benefit of all Users and for the protection of the Distribution System, User facilities and appliances directly connected to the Distribution System

4.1.2. Distribution System Connection Conditions establish certain principles and standards relating to connection provisions, connection method, technical standards and performance standards

Distribution System Connection Conditions specify the information to be provided by the User to ensure that adequate provisions can be applied by the DSO for new connections or increase existing loads. This also applies to producers who operate in parallel with the Distribution System when connection is required. Next / future users must on time submit to the DSO all details that are presented in this chapter

4.1.3. Regarding the Terms of Connection, the Connection Agreement must be signed, which is a bilateral agreement between the DSO and each User, which contains specific details for each Users connection and for the use of the Distribution System. The Connection Agreement requires the User and the DSO to act in compliance with the terms of the Distribution Code. In general, the basic connection document is issued first, in which the technical conditions of the



connection are precisely defined, which the User is obliged to fulfill before the connection to the distribution network

4.2. Objective

- 4.2.1.** Connection Terms define the minimum standards for the method of connection to the Distribution System, technical design standards and those of operations, with which the User who connects to the Distribution System must comply
- 4.2.2.** The Connection Terms specify the technical arrangements required at the Ownership Boundary between the Distribution System and the User installation and is applicable to all voltage levels covered by the Distribution Code
- 4.2.3.** The Terms of Connection, among others for communication, reading and monitoring, also underline the type of adequate signals and events that will be required by each User to make them available to the DSO.

4.3. Purpose

- 4.3.1.** The purpose of this paragraph is to meet / fulfill the following objectives:
 - a.** All existing or potential Distribution System Users should be treated equally
 - b.** Any new connection should not cause any negative effects on existing Users, or a new connection should not be affected by the negative effects of existing Users
 - c.** Assist Distribution System Users to implement their obligations and ensure high quality operation and maintenance of their installations



- d. To specify clearly and in a standard format, the obligations and responsibilities for all Distribution System Users, for each place where a connection is worked / modified

4.4. Information requested for connection

4.4.1. For low voltage connection in most cases it is possible to assess whether the proposed connection is acceptable or not and to determine the necessary supply arrangements, from the data analysis that will be shown below

4.4.2. The following information is required for low voltage connection to the Distribution System:

- Name of the object (naming of the consume);
- Location of the facility, address, attachment of a location map to the relevant area if required by the Distribution System
- Specific of the activity (production, marketing, services, etc.)
- Type of connection required (single phase or three phase);
- Installed power in kW;
- Electrical Project of installations of user worked from company registered which has allowed activity the electrical designs (projecting);
- Evidence Statement of Installation Works and Installed Equipment related to Electrical Installations, issued during Phase II of the Inspection, according to point 3.4 given in Annex 4/c: Inspection of the Phases of the 'Administrative Instruction for Inspection Supervision and Procedure for Issuance of Certificate of Use



- Maximum requirements for kW or kVA;
- Annual demand (request) for electricity in kWh;
- Type and electrical load of the equipment to be connected (such as number and power of motors, lighting, etc.)
- The average power factor, with which the consumer will work ($\cos\phi$);
- The date the connection is requested

If the preliminary evaluation of this data indicates that more detailed information is required, then it will be provided by the respective DSO User / Customer at the request of the DSO

4.4.3. If an early review of these data indicates that more detailed information is reasonably required then a request should be submitted to the DSO

4.4.4. The information criteria and time frames for the assessment and connection are defined in the "Methodology of Distribution System Connection Fees". This should also contain the application forms, which are required / obliged to be completed by all Users who request the connection or capacity raising for which the expansion of the Distribution System is required. A copy of this document is made available to the DSO, through a directed request

4.4.5. For connection to Medium Voltages the conditions also apply as in 4.4.1 and 4.4.2. In addition, the following detailed information may be requested under the Technical Data Register.

A. All types of requests

Medium Voltage Connection Information Required:



- Name of the facility (naming of the consume);
- Placing (Definition / Location) of the object, address. Attach a sketch of the location in the relevant area;
- Specifics of the activity (production, service, as well as the way of working, number of shifts during the day, working days per week, etc.);
- Power installed in MW;
- Load Diagram;
- Average power factor with which the customer will work ($\cos\varphi$);
- Electrical project of the User's installations developed by the registered company that has the activity allowed electrical designs and which is in harmony with the construction documentation;
- Evidence Statement of Installation Works and Installed or placed Equipment related to Electrical Installations, issued during Phase II of the Inspection, according to Annex 4/c: Phase Inspection, defined in point 3.4 of the 'Administrative Instruction for Inspection Supervision and Procedure for Issuance of Certificate of Use
- If the **User** is connected and requires a modification of the existing **connection**, it should submit: actual manner of supply of the object (scheme, characteristics, supply roads and the metering method of the consumed electricity)
- Must be given also one copy of agreement for connection taken before and scheme of placement of installations of supply with existing points taking / receiving and measuring;



- Request for maximum active electricity, minimum annual and 5 years;
- Request for maximum reactive electricity, minimum annual and 5 years;
- Type of load and agreements of control (example: method of releasing the motor, etc.);
- **Maximum** load for each phase;
- **Harmonics** maximum of voltage and current that might be imposed over distribution system;
- Details of variations of cycles load or fluctuating loads (like below); deregulating loads
- General prospects of new equipment installed including details of disturbing loads. These are loads which have potential to insert harmonics, fluctuation or missing of unbalances in distribution system;
- **Fluctuating loads;**
- The technical data for equipment which generate reactive power if there is;
- Responsibilities for control and maintenance of equipment;
- Date when is requested the connection.

B. Disruptive loads

The comprehensive list of the new installed equipment (a), including details of disturbing **loads**. These are **loads** with the potential to create **harmonics**, fluctuation or unbalance in the system. This could have a different (opposite)



impact in the quality of the other customers' supply. Disruptive **loads** can be non-linear loads, power converters (regulators) and the loads with large fluctuation demand. Type of information on requested **load** for mobile power load, welding equipment, **harmonics** that create non-linear **loads** and **generating equipment**, may be obtained from **DSO**, upon request appearance.

In case of compensation of the equipment connected to the disturbing **loads**, the details and operation manner should be provided to ensure compliance with the boundaries of emission specified under 4.6.8.3.

C. Fluctuating (oscillating) loads

Different cyclic details, when the cyclic operation applies, of the **Active Power** and the **Reactive Power**, especially:

- i. Levels of the load of **Active Power** and the **Reactive Power**, both during increasing and decreasing
- ii. The shortest repetitive time interval between the fluctuations of **Active Power** and **Reactive Power**; and
- iii. Size of the highest step / pitch loads of **Active Power** and **Reactive Power**, both during increasing and decreasing

4.4.6. In some cases, more detailed information may be required to allow a full assessment of the effect of the User load on the Distribution System. Such information may include indicators of a selected load construction model and a proposed commissioning program. This information will be specifically requested by the DSO when necessary and will be provided by the User within a reasonable time



4.4.7. Users will contact the DSO in advance if it is proposed to make any significant / important changes to the connection, electrical line or electrical equipment; install or operate any producing equipment or do any other work that may have an effect on the Distribution System or require connection changes

4.4.8. Users must submit to the DSO the information reasonably required by the DSO regarding the nature or use by the User of the electrical equipment in the User's premises

4.5. Arrangements of connection

4.5.1. Voltage of Connection

4.5.1.1 When applying for connection, the DSO shall, in consultation with the User, specify the voltage level at which the User shall be connected in accordance with the normal conditions for the type of load to be supplied and the characteristics of the network

4.5.1.2 In general, the voltage level will be the minimum rated (nominal) voltage in the standard use in the Distribution System, (defined in 3.6.2.1 and 3.6.2.2), rated against:

1. acceptable technical stability of the installation
2. Isolation of barriers (obstacles) coming from other consumers
3. life cycle costs
4. connection cost

4.5.1.3 The nominal 10 kV system should be progressively converted to 20 kV until the 35 kV system is converted in favor of 110 kV systems, where the optimal solution is and will be developed only to the extent that it represents a



transitional solution towards conversion to level 110 kV and the level of 20 kV where the choice is optimal for a period of use not shorter than 10 years. For these reasons:

- Connections to 10 kV should have the possibility to convert to 20 kV at the same time when the local network is converted; and
- The DSO should advise potential possible Users at the time of application if there is a consistent plan to change operations from 35 kV to 110 kV or 20 kV at a future date. In such cases Users should take action (measures) for such a change

4.5.1.4 The DSO may from time to time specify a voltage other than the rated / nominal one, in order to avoid potential obstructions caused by the User's apparatus to other Users in the Distribution System or for other technical reasons, or alternative methods may be agreed upon to reduce the effects of obstructive loads.

4.5.2. Information which are provided from DSO

4.5.2.1 Based on the information provided by the User for connection to the Distribution System, the DSO will prepare a summary of the situation containing as many elements as necessary, or relevant, for the proposed installation, such as:

- (i) The nominal voltage at which the connection will be made
- (ii) Connection method, extension and (or) supporting details
- (iii) Normal source impedance at the connection point, and other relevant short-circuit current factors, etc.
- (iv) Earthing method



(v) Maximum import capacity

(vi) Limits of individual customers in relation to:

- Distortion of Harmonics
- Voltage fluctuations
- Imbalance

(vii) Waiting period until the new connection is realized (after the terms of supply are officially accepted)

(viii) Cost of connection

4.5.3. Limits (boundaries) of Ownership

4.5.3.1 The point or points at which the electricity supply is provided or received between the Distribution System and the Users installation system shall be agreed between the DSO and the User as required. The same will be decided with the connection agreement or with the technical conditions of connection, which will be in accordance with the requirements of the User

4.5.3.2 Mainly at the dividing border of assets is placed the measuring point except in cases when this does not represent the optimal possible technical solution and the same is evidenced in the documentation with the relevant reasons for its relocation (dislocation)

4.5.3.3 For LV supplies the responsibility of the DSO extends to the customer connection point which is normally:

- a) Exit points at feeders (exits) of current measuring transformers **(L) and entrance in main breaker / switcher** at supply of Customer.



b) In business and household buildings: at the Connection Point at the output / exit part of the meter

4.5.3.4 For Medium Voltage supplies, ownership limits will be subject to specific agreement between the parties on a case-by-case basis. Changes to the border agreements proposed by either party must be reached in advance

4.5.3.5 All equipment at the Property Limits shall meet the design criteria set forth in Chapters 3 and 4. The inlet (entry) and outlet (exit) connections from the Distribution System shall incorporate the means of disconnecting the installation of User from the DSO

4.5.3.6 Relevant ownership of the plant (facility) or apparatus must be recorded in a written agreement between the DSO and the User or in the form of a diagram, upon request. In the absence of a separate agreement between the parties, responsibilities for construction, control, operation and maintenance are determined according to the preliminary conditions of the ownership boundary.

4.6. Technical criteria for connection

4.6.1. Standards of connection

4.6.1.1 Connection Conditions define the minimum standards for the method of connection to the Distribution System with the technical standards of operational planning, which will be met by the Users connected to the Distribution System. The Connection Terms specify the technical arrangements within the ownership boundaries between the Distribution System and the Distribution System User Installation and its application to all Distribution System voltage levels. The Connection Conditions summarize the types of data and indicators that will be required to be available to the DSO by each



Distribution System User. The Connection Terms are applied by all Users connected to the Distribution System, who require the modification of the existing connection, as well as by the Users who plan to connect to the Distribution System

- 4.6.1.2** New applicants and / or existing Distribution System Users during the new connection or during the increase of power and operation with their equipment should not create obstacles in the distribution network, which would manifest and affect the other Users of the System. If the applicant / user does not adhere to the standards set out in this CODE, the DSO enjoys the right to take measures in accordance with certain situations, without restricting the right to disconnection from the electricity supply, as defined in the Rule for disconnection and reconnection of consumers in the energy sector
- 4.6.1.3** A connection to the Distribution System can be made through an overhead line, an underground cable or a combination of both. The network configuration at the Connection Point can take a number of forms appropriate to the nature of the network load and arrangements.
- 4.6.1.4** All equipment in an installation connected to the Distribution System must be designed, manufactured, tested and installed in accordance with all applicable legal / law obligations and will comply with relevant CENELEC standards, EU Directives, IEC and by the Kosovo Standardization Agency SKEN, which are current and applicable at the time of connection or installation in the Distribution System.
- 4.6.1.5** If in specific cases, when reference is not made to approved local standards, then any relevant European Union standard applicable on the date of the applicable User Connection Agreement shall be used. If the DSO deems it necessary, it can notify the User that it will comply with the fulfilled specifications and standards, in which case the User's facilities and equipment / apparatuses must also be adapted



- 4.6.1.6** All equipment in an installation connected to the Distribution System shall be suitable for use in the operating frequency of the Distribution System and at the rated / nominal values of voltage and short-circuit current of the Distribution System, as shown at 4.6.5.1 at the Connection Point. The DSO may require certification that the equipment is designed and installed in a satisfactory manner. The DSO may also require evidence that the equipment has been tested to comply with IEC standards.
- 4.6.1.7** For Low Voltage Connected Users, the installations must comply with the National Standards for Electrical Installations SKEN, IEC standards and any other regulations issued by the State Institutions of Kosovo from time to time. Users who comply with these rules and regulations will be required to comply with the Distribution Code requirements in terms of design, measurement and safety aspect. The DSO may require evidence of equipment testing to comply with relevant standards
- 4.6.1.8** Prior to entering into a connection agreement, it will be necessary for the DSO to assess as satisfactory that the User system at the border with the Distribution System is in compliance with the appropriate requirements of the Distribution Code.

4.6.2. Requirements of protection

- 4.6.2.1** Users shall ensure that defects in the Users plant / facility and apparatus do not cause unreasonable obstruction to the Distribution System or to other Users. Without limiting this obligation, a User must, before connecting the installation to the Distribution System, install the protective device
- 4.6.2.2** Drops (failures) with specific defects in the Distribution System may cause damage to the User's plant and apparatus. These defects can result in phase loss, overvoltage's or under voltages and can damage both producers and users



of the Distribution System. Undertaking preventive - protective and restrictive measures, both by the DSO and the User, minimizes and eliminates them. Users should take into account the established practices of any particular network to which the connection will be made and ensure that the protection installed will be consistent with that used by the DSO. The adequacy of the protection installed by the User is his responsibility

4.6.2.3 Protection Arrangements within User Ownership Limits, including types of equipment and protection, must be compatible with existing system conditions and Distribution System protection practice as specified by the DSO during the application process. Especially:

- a) The maximum times of the period (from the beginning of the failure to the extinction of the arch) must be within the limits set by the DSO and in accordance with the standards for the assessment of short-circuit currents for protection and equipment built for the Distribution System
- b) When connecting to the Distribution System, the User will be aware that fast and slow automatic reconnection is a feature of the operation of the Energy System. This is characterized by unexpected de / re-energizations of the electricity supply. Voltage-free times are usually 3s and 60s in Medium Voltages; and
- c) Users will also be aware that disconnecting only one or two phases of a three phase system may be affected by Distribution System protection arrangements for certain types of faults

4.6.2.4 The minimum protection required for the User's installation connection to the Distribution System shall vary according to the voltage, type, size, connection method (such as cable twisted connection) and the User's system earthing

4.6.2.5 Low Voltage Customers must comply with Chapter 5 of the Distribution System and state customer connection practice



4.6.2.6 At new connections as well as changes to existing Users installations is foreseen that all or some of the following protective equipment may be required:

- a. Overcurrent protection against overload and short circuits with several steps
- b. Short circuit with earth protection (suitable for the part of the system at the connection point and with the possibility of adaptation);
- c. Differential and negative energy flows (where required by rules);
- d. Other protections (above and below voltage, frequency, etc.) according to voltage, connection place, system structure and type of User based on applicable technical recommendations

4.6.2.7 At the inter connection place, where circuit breakers are used, they must be installed with relay types acceptable to the DSO. These relays will have overcurrent elements, three phase overload and an element for short circuit to ground. These relays will have the time-current characteristic that complies with the types of standards A, B and C of IEC 255

4.6.2.8 Maximum acceptable parameters (maximum parameterization limit) for relays at ownership limits, which are necessary to ensure selectivity with distribution equipment, shall be provided by the DSO. These parameters may be reviewed by the DSO at any time in the future. Distribution System Protection aims to reduce the impact of outages / drops including the time duration of the voltage drop and should not have the opposite impact of the limitations (shortcomings) of Users protection:

- a. In order to ensure satisfactory operation of the Distribution System, protection systems, operating times, selectivity and sensitivity at the ownership boundary will be agreed between the DSO and the User when applying for the connection process, and may be reviewed time after time by the DSO;



- b. In order to cover a circuit breaker, or device having a similar function, which fails to operate correctly to interrupt the breakdown currents in the system, auxiliary protection through the operation of other circuit breakers or devices having function the same, for normal conditions must be provided; and
- c. Unless the DSO advises otherwise, it is not acceptable for Users to limit fault supply currents in the Distribution System through the use of fault current suppression equipment, so that faults in that protection equipment or associated fault in the event of fault occur have an impact on the operation of DSO-owned protections, which will operate outside its nominal category

4.6.2.9 Protective relays must be commissioned on site by the User who will ensure that the parameters are below the maximum permitted levels. In certain cases the DSO may request to be present during their testing and it will be the responsibility of the User to ensure that sufficient advance notice has been given to the DSO of such cases. Users will ensure that the protection settings / parameters remain below the maximum permitted levels. This requires regular periodic testing of these relays.

4.6.3. Earthlink

- 4.6.3.1 Earthlink of the User part of the installation which is connected to the Distribution System shall be in accordance with the criteria of this Chapter.
- 4.6.3.2 The arrangements for connecting the User's electrical installations to the ground (for earthlink) shall be designed to be conform to the relevant international standards. The way and values of earth resistance will be established / created according to the relevant technical instructions as well as based on the relevant IEC standards



- 4.6.3.3 Distribution System Transformer Star earthlink method must be determined by the DSO, depending on whether the star is connected directly to ground or through an impedance (resistance). The specification of the protection device connected to the distribution system must meet / fulfill the values of the allowable voltage, which will operate on the switching devices as a result of the earthlink method
- 4.6.3.4 Users shall take precautions (advance measures) to limit the occurrence and effects of circulating currents in harmony with neutral points connected to ground / earthlink, where there is more than one source of energy supply

4.6.4. Regulation of voltage and control

- 4.6.4.1 Extensions or Connections to the Distribution System shall be designed in such a way as not to impede the necessary voltage control of the Distribution System. Voltage regulation information and control arrangements should be made available by the DSO, if required by the User
- 4.6.4.2 The DSO, based on the design and configuration of the distribution system parts, shall harmonize with the TSO and the Independent Producers connected to the Distribution System the maximum and minimum limits of automatic voltage regulation, so that the maximum values allowed by the standards IEC and the values defined in this Code should not exceed those of the first or last customer of a relevant part of the system
- 4.6.4.3 DSO for fulfilling the obligations to producers and consumers in the absence of the possibility of automatic voltage regulation conditioned by the limit of separation of fixed assets with the TSO, will require the TSO to implement the defined maximum and minimum values of automatic regulation of medium voltage at the limits adequate to fit the location and configuration of the energy



system and which will be within the limits according to the standard IEC 50160 and the limits defined in this CODE

4.6.5. Definitions on Permissible Short Circuit Current Levels

- 4.6.5.1 The value of short-circuit currents of the User equipment at the connection point must not be less than the allowed limit, defined according to the Distribution System, calculated for each point of the system taking into account the 10-year planning system development with simulated calculation. The choice of the device for connection to the Low Voltage is determined so as to take into account the voltage drops in the lines of the distribution system. The DSO during the analysis and calculations must take into account the contribution of Independent Producers and other consumer equipment at the level of the defect in the Distribution System and in the connected system of the User.
- 4.6.5.2 For each connection to the distribution system, through the connection agreement and information on the technical conditions of connection, the User will receive the maximum values of short-circuit currents at the connection point, for the design and design of equipment at the connection point and selection of equipment for internal installations of the facility under construction. For Existing Users this information will serve as a guide on meeting the technical requirements of existing installations and equipment with the requirements required on the stability of equipment and replacing them in cases where they are not in line with the expectations of fault levels at the connection point with Distribution System. The DSO will not be liable for damage to the equipment of existing Users if their equipment does not comply with the minimum requirements of short-circuit currents at the connection point and in their internal installations
- 4.6.5.3 In cases when the equipment is intended for spare parts and their destination is not determined, then the values of short-circuit current stability are selected according to the description in the following table. A selection of equipment according to this table is made for all cases when at a certain point due to rapid



developments of construction that cannot be planned and the expected values of the parameters change continuously, which require continuous development of Distribution System in accordance with these construction flows

Voltage in connection	Level of short circuits (RMS Symmetrical) "Standard"		Level of short circuits (RMS Symmetrical) "Some certain parts"
LV (Household)	9.0 kA (no apartments peripheral)		
LV (Ind/Com)	37.0 kA [according to calculations]		
6.3 kV	31,5 kA	25 kA	40 kA
10 kV	31,5 kA	25 kA	40 kA
20 kV	31,5 kA	25 kA	40 kA
35 kV	31,5 kA	16 kA	40 kA

The values in the table generally have the meanings of the following descriptions

- 40 kA/s, when energy transformers (HV/MV) are >40 MVA
- 31.5 kA/s when energy transformers (HV/MV) are <40 MVA
- 25 kA/s all transformations in level of DSO
- 16 kA/s for levels 35 kV, periphery locations

One pole current of connection with earth in transformations 110/x kV, 300A

Impact currents of short circuits are selected according to standards in values 2 up to 2.5 times of value of symmetrical current of short circuit.

- 4.6.5.4 At the special request of the Users, and by providing a professional study by him on how to achieve the amortization of short circuit currents at the designated location and the connection point selected and approved by the DSO or TSO according to case, the equipment can be selected according to the calculations of these studies, provided that after the completion of the project,



the application of the equipment according to this study must be re-verified. In such cases changes to the connection point and the selected equipment cannot be made without re-verification and change of connection conditions by the DSO

4.6.5.5 The inbound / entrance supply of the User shall be controlled by a main circuit breaker which shall comply with the internationally recognized standard acceptable to the DSO

4.6.6. Insulation Levels (Insulation resistance of equipment at test voltages)

4.6.6.1 The design of an equipment of operator connected to the Distribution System shall be such as to enable the voltage resistance (which is verified by the test) for the alternative AC industrial voltages and the impulse voltages (impacting **1.2/50 μ S**) presented as in the following table:

Nominal Voltage of Equipment	Coping (resistant) voltage AC (1min)	Impulsive Voltage (1.2/50 μ S)
LV (0.4 kV)	3 kV	6 kV
6.3 kV	20 kV	40 kV
10 kV	28 kV	75 kV
20 kV	50 kV	125 kV
35 KV	70 KV	170 kV



4.6.7. Capacitive and Inductive Effects

4.6.7.1 The user (during the connection application) must provide the DSO with the information as detailed in the design standards. Details of each Medium Voltage Compensor connected which might have influence in the Distribution System and which are proposed to be connected if agreed with the DSO should be provided. When required by the DSO, details on the capacity distribution and inductance of the circuit must also be provided. Sufficient details are required for:

- a. verify that the Distribution System control equipment is adequately rated;
- b. indicate that the performance of the Distribution System will not be impaired (weakened), and
- c. ensure that the capacitors (coils) for capacitive current quenching in the neutral of the Distribution System are installed and used for operation correctly / accurate method.

4.6.8. Disturbances / disorder of voltage

4.6.8.1 Distribution System Users shall not create voltage disturbances / obstacles at the level that would affect other Users. Users for their interest should choose the device which is able to function satisfactorily in the presence of obstacles up to the levels allowed by the standard SKEN 50160

4.6.8.2 It is a connection condition that the equipment connected to the Distribution System must comply with the requirements of EC Directive EU 89/336 / EEC (EMC Directive) after its amendments in 2004/108.

4.6.8.3 Loads and installations shall comply with the following tolerance limits:



A. Vibration of Voltage

- i. Frequency of appearance: (0.22 – 600) for min.:

Voltage Level	Pst	Plt
MV,LV	1.0 unit	0.8 unit

Pst- Short-Term Vibration Severity - an index of visual acuity estimated over a period of 10 minutes.

Plt- Long-Term Vibration Severity - an index of visual acuity estimated over a period of 2 hours. or

$$P_{lt} = \sqrt[3]{\sum_{i=1}^{12} \frac{P_{sti}^3}{12}}$$

- ii. **Frequency of occurrence:** (0.02 – 0.22) for min.

Amplitude up to 3% is allowed

- iii. **Frequency of occurrence:** ≤ 0.02 for min.

Amplitude up to 5% is allowed.

B. Distortion of Harmonics

- i. The individual rule of the Harmonics:

Harmonic Voltage Distortion (%) compared to the first harmonic (rms voltage as a % of the rms value of the fundamental-main component)



Ordinal No. of harmonic:	LV %	MV %
2	0.70	0.50
3	0.75	0.50
4	0.70	0.50
5	2.00	1.00
6	0.50	0.50
7	2.00	1.00
8	0.50	0.50
9	0.50	0.50
10	0.50	0.75
11	1.50	1.50
12	0.50	0.50
13	1.50	1.50
14	0.50	0.50
15	0.50	0.75
16	0.75	0.75
17	0.75	0.75
18	0.50	0.50
19	1.00	0.50

rms – in effective values



ii. Total Harmonic Distortion

Voltage Level	Distortion of voltage of harmonics %
LV	2.5
MV	2.0

C. Imbalance

The imbalance caused by the connection of an individual installation shall not exceed 2 units at the point of joint connection

4.6.8.4 Under conditions of breakdown and network operations, the categorized voltage frequency component may drop or rise temporarily. The rise or fall in voltage will be affected by the way the neutral point of the Distribution System is grounded (earthlink) and the voltage may drop temporarily to zero at all points in the system

4.6.8.5 Sections 3 and 4 of EN 50160, taking into account also the periodic updates and contains additional details of changes and obstacles in the voltage, which will be taken into account in selecting the device from the appropriate specifications for installation or connection to system

4.6.9. Power Factor and Balancing Phase Sequences

4.6.9.1 The User shall take reasonable steps to operate the plant and equipment to maintain the total load power factor at the point of connection for imported electricity between 0.95 and 1 (one) and exported electricity between 0.95 and 1 (one). Windmills producers should keep the power factor between 0.92 to 1 and 1 to 0.95 capacitive. For the purpose of this Code, the power factor refers to the acquisition of reactive power. These are the minimum requirements. In certain cases specific requirements may be applied in order to ensure that the DSO can act / comply with the requirements of the Network Code



4.6.9.2 DSO requirements for sequential balancing of phase components are covered in standard EN50160

4.7. Measurement / Tele measurement

4.7.1. The User may be required to provide such signals and impulses of voltage, current, frequency, Active and Reactive Power which are deemed necessary by the DSO to ensure adequate monitoring of the system. Details will be specified in the User Connection Agreement

4.7.2. Production Units dispatched by the National Dispatch Center will provide signals to the TSO as required by the Network Code.

4.7.3. If an agreement is reached between the parties, so that the DSO will control the switches in the User system, the DSO will install an external station necessary for remote / tele control. Notwithstanding the foregoing, it shall be the responsibility of the User to provide the necessary control interfaces to the User switches to be controlled

4.7.4. The metering principles that apply to certain Users connected to the Distribution System are specified in the Metering Code.

4.7.5. The specific measurement arrangements depend on the type of load, the size and the nature of the installations that are connected to the DSO

4.7.6. The person who performs the design or installation work for the User, must be familiar with this Code and in agreement with the DSO must work and act in accordance with this Code. In unusual situations, positions may appear that are not covered by this Code and in such circumstances the DSO will be ready to deal with the requests and questions of the Work Performing Personnel.



4.8. Specific Arrangements

4.8.1. Specific connection arrangements, including substation planning requirements, User equipment, tariffs and metering are clearly set out in a number of documents presented below (a, b and c). Users must comply with the requirements of the relevant documents in their installations

- a. "Conditions for Connection to the Distribution System" and "General Conditions for Connection of Industrial, Commercial Customers and Producers to the Distribution System";
- b. Conditions which govern the connection to the Distribution System: Connections to 35 kV, 20 kV, 10 kV, 6.3 kV for consumers and Independent Producers in LV, 6.3 kV, 10 kV, 20 kV and 35 kV
- c. General specification for facility of medium voltage substation (MV)

4.8.2. Low voltage supplies (230V / 400V) are common. Service standards in relation to such supplies are set out as follows:

1. Connection scheme in the Distribution System
2. Rules for low voltage supplies, which are defined in more detail in the other three documents:
 - a) Distribution System Connection Tariff Methodology and Rule on General Conditions for Energy Supply
 - b) New household supply: Procedures and conditions for the supply of a new facility (object) from the Distribution System;
 - c) Existing household supply: Specification of conditions for supply up to metering point

It should be taken in consideration that all security requirements referred to in -5.8 are subject to update and change. At the time of any proposed connection, they should only be used.



Chapter V

5. Distribution System Operation

5.1. General Part

5.1.1. Introduction

- 5.1.1.1.** In order for the DSO to operate the Distribution System efficiently and to provide maximum security and stability of the system, the Users specified in 5.1.1.6 must submit the load and Output / production Information connected to the Distribution System to the DSO and QDSh.
- 5.1.1.2.** The Distribution Code specifies the information that must be submitted to the DSO by other Distribution System Users so that these requirements can be met / fulfilled periodically.
- 5.1.1.3.** The information to be submitted to the QDSh based on the operation of the Distribution System is required to enable the DSO to maintain the operation of the Distribution System.
- 5.1.1.4.** When data is requested by the User means the request for electricity at the Connection Point. The DSO may in some cases specify that the required data must also include the MVar request
- 5.1.1.5.** Ways of submitting information to the DSO and confirming it include any type of written (non-transferable) form, or any type of electronically submitted transfer that enables the recipient to retain (store) the information exchanged
- 5.1.1.6.** The objectives of the Distribution System operation are:
- Submit the load forecast and information coming out of the Production Plant to be provided by the Users, so as to enable the DSO to operate the Distribution System.



- Specify the information to be submitted by Users to the DSO to enable compliance with the obligations taken from the Grid (Network) Code

5.1.1.7. The users of the Distribution System that have this scope, and that must be acted according to point 5.1.1.6, are:

- End customers connected to the Distribution System, - for whom the DSO considers it necessary
- Medium Voltage Consumers for whom the DSO deems it necessary, and
- Independent producers with Production units connected to the Distribution System, - which the DSO considers necessary

5.1.2. Flow of information and coordination

5.1.2.1 The DSO shall coordinate load forecast information for each supply point of high consumption customers to meet the requirements set out in the EOT Grid Code. The DSO will collect forecast information submitted by Users, when appropriate, and submit forecast information to the TSO where the load or change is greater than 10 MW at each connection point

5.1.2.2 Information from Independent Producers connected to the Distribution System who are not subject to the QND must be submitted to the QDSh, where specified. Users with unregulated prices and Self-Productive Customers should also be required to submit the required information.

5.1.2.3 Production Units that respond to QND must comply with the requirements of the Grid Code. The information must be submitted directly to the TSO

5.1.3. The data about forecast of load – power



5.1.3.1 Production Units larger than 2 MW and not subject to QND must submit to the QDSh information on outputs and outage planning for future specified time periods. This will be presented on an annual basis when required by the DSO. The required information is provided in the Technical Data Register (TDR)

5.1.3.2 Customers with unregulated prices must submit to the DSO information on the load and planning of outages at least 30 days in advance to the QDSh. This will be presented on an annual basis, when required by the DSO. The required information is presented in the Technical Data Register.

5.1.4 Loss of Control Center

5.1.4.1 The DSO Control Center plays an essential role in providing the DSO with the ability to put in operation the energy distribution system to the required levels of security and reliability. In cases where the DSO control center becomes unusable due to exceptional circumstances, then a control center crisis plan should be made available for the smooth transfer of control center functions to facilitate operation continuously, securely and controlling the entire Kosovo Distribution System.

5.1.4.2 The **control center** crisis plan shall be prepared by the **DSO** and shall include at a minimum the following:

- Details of the emergency communications methods for agreeing the transfer of **control center** functions
- A check list of the actions (measures) to be taken and by whom will be undertaken
- The detailed arrangements for the transfer of the control functions

5.1.4.3 The **control center crisis plan** must be tested fully or partially on a regular basis at least once every [two] years to ensure that it is viable, that the necessary information is available in the correct locations and that the staff are fully trained to carry it out



5.2 Coordination of planned outages (interruptions)

5.2.1 Goal and Objectives of Coordination of planned outages

- 5.2.1.1** Operation of Distribution System coordinates **Planned Outages** of switchgears (facilities) and equipment which influence in operation of **Distribution System** through dispatch center of distribution (QDSH)
- 5.2.1.2** The **DSO** fulfills obligations rising from **Distribution Code** in order to ensure certain information for **TSO** based on **Grid Code** and produce procedures which enable specific data gathering of **Users**
- 5.2.1.3** The way how information is secured at **DSO** and their confirmation includes any regular written form or any other possible electronic form which enables receiver to maintain / safe keep information
- 5.2.1.4** In order that **DSO** fulfill these requirements of operation of distribution system, it must be made aware that certain information from the **Grid Code** will be secured by **TSO** which than will be a base for operation plan of Distribution System
- 5.2.1.5** Objectives of operation of Distribution System are:
- QDSH drafts (compiles) procedures of operating plan and time Schedule suitable for coordination of interruptions of loads for switchgears (facilities) and equipment presented from **User**, so it enables to **DSO** to operate with Distribution System.
 - QDSH specifies information which appear / present from side of Users to DSO in compliance / accordance with code of distribution



5.2.1.6 Coordination of planning of interruptions from QDSh is applied for these **Users of Distribution System:**

- **Customers with unregulated prices connected in distribution system,**
- **Customers in medium voltage for which DSO considers it is necessary;**
- Switchgears (facilities) of independent producers which are not subject of **QND**; and
- **Customers with unregulated prices and self – producing**

5.2.2 Preparation of Information

5.2.2.1 Information for switchgears (facilities) of independent producers which are not subject of **QND** (including **Customers with unregulated prices and customers self – producing**) must be send to DSO as it is specified in planning of distribution system

5.2.2.2 Information from Production Units managed by the National Dispatch Center must be submitted to the TSO and comply with the criteria of the Grid Code.

5.2.3 Time Schedule and Data

5.2.3.1 The data collected and time Schedule implemented must be determined from DSO and from each other user. Reasonable approval for voltage level, capacity of switchgears (facilities) and equipment must be given from DSO when appears request for evaluation of information.

5.2.3.2 Information may be requested for different time periods as determined according to the planned needs of the TSO or DSO

5.2.4 Information about independent producers



5.2.4.1 Information for **QDSH** from facilities of independent producers with power higher than 2 MW and which are not subject of **National Dispatch Center (QND)** must contain detailed interruptions planned for maintenance or for other purposes and also time when is expected to start the work.

5.2.4.2 The generating unit will not be synchronized without obtaining permission from the DSO unless an agreement has been reached with the DSO in advance

5.2.5 Information for Users

5.2.5.1 The DSO shall inform Customers at unregulated prices or Producers who may be specifically affected by the designated outage of Distribution Facilities and equipment of the possible date of outage and its time duration. In case of complaints from Users, they should be considered and additional consultations proposed for alternative solutions for the interruption period.

5.3 Managing of loads for special (particular) cases

5.3.1 The purpose of managing the loads for special cases

5.3.1.1 Special cases load management of the Distribution operation relates to the preparations to be made by the DSO or Distribution System Users, to allow the load to be reduced in special cases, in case of insufficient quantity of available electricity provided by the Generating Stations (facilities) or transferred from the external interconnection to cover overload to avoid interruptions with customer proportions, in case of outage (fall) and (or) other problems (such as p. eg taking into account the system frequency, system voltage level or thermal overloads) in each part of the Transmission or Distribution System.

5.3.1.2 Load control procedures ensure that problems for Customers and Users are minimized and all those who have been affected by this problem are treated equally.



5.3.1.3 The loads management process of special cases deals with the following methods for reducing the load:

- a. Automatic load interruption for frequency and low voltage
- b. Customer load adjustment including voltage reduction;
- c. Customer load management initiated by Suppliers or other groups, except those coming from the instructions of the TSO and DSO
- d. Customizing (adjusting) the customer load with instructions received from the TSO or DSO; and
- e. Emergency manual for disconnection

The term load control is used to describe any or all of the methods used to achieve load – overload reduction - decrease

5.3.1.4 When load control is being implemented by the DSO, it should be done in such a way that practically as much as possible does not discriminate against any customer or supplier and should make reasonable efforts so that the separation to be done correctly between customers. There may be special cases for vital customers (hospitals, emergency services, strategic facilities, etc.) and those with priority mining, industry, manufacturing (producing), etc

5.3.1.5 The objectives of loads management for special cases are to establish procedures that enable the DSO to implement the instructions received from the TSO; to achieve demand reduction that will remove; alleviate the problems of operation in the Transmission System; and / or the Distribution System, in whole or in part in such a way as not to unfairly discriminate or favor any group of its suppliers or customers in accordance with the Distribution Operator License

5.3.1.6 Loads management for special cases is implemented by the DSO and all Distribution System Users



5.3.1.7 The implementation of load control by the DSO may have an impact on all customers and suppliers that are connected to the Distribution System and where the agreement between suppliers and their customers applies should be based on this control plan of load.

5.3.2 Methods for Control of Load

5.3.2.1 The customer supply may be automatically disconnected at selected locations in accordance with the requirements of the Grid Code, in the event of a sudden decrease in frequency. Such an action must be carefully coordinated as part of the overall scheme and must be accounted / calculated for in each operating load or essential load.

5.3.2.2 Automatic disconnection from under voltage relays can be used to violently interrupt the load at the MV level in order to keep the voltage within certain limits to avoid supply interruption for the whole region.

5.3.2.3 Intentional voltage reduction can be used to achieve instantaneous load reduction

5.3.2.4 Intentional load reduction can also be used to achieve instantaneous load reduction in accordance with the Grid Code

5.3.2.5 Complete emergency interruption of the load may occur in the Distribution or Transmission System due to lack of supply or other technical reasons.

5.3.2.6 In the event of a missing supply for a longer period of time then a planned rotational outage can be used to split the electricity between the affected Users (those without electricity)

5.3.3 Implementation of Load Control



- 5.3.3.1** When applying load control by the DSO based on instructions or request from the TSO in order to protect the whole system, then the DSO is required to respond to requests in a timely manner and will act and inform Users as much as practically possible
- 5.3.3.2** Load adjustment procedures including reduction policies, load reduction rotation and customer communication shall be included in the load reduction distribution plan approved by the DSO

5.4 Operating Communication and Action

5.4.1 Purpose and Objectives of Operating Communication

- 5.4.1.1** Operational communication sets out the requirements for the exchange of information in relation to the operation and / or stability of the Distribution System or the installation of any User who is connected to the Distribution System, who have had or may have, or will may have an effect on the operation of the Distribution System or on the installation of any other User.
- 5.4.1.2** The objectives of operational communication and action are to ensure the exchange of information so that the implications of the operation and the opportunities, taking into account the possibility of risk arising from this, can be assessed and concrete action taken by the designated group in in order to maintain the integral wholeness of the system as well as the installations of the Users. Operational communication does not seek to deal with any action that arises from the exchange of information but merely / simply deals with Exchange.
- 5.4.1.3** Operational communication is implemented by the DSO and all Distribution System Users throughout the territory of Kosovo:



- a. Customers with unregulated prices connected to the Distribution System and Medium Voltage customers for whom the DSO deems it necessary
- b. Independent Centrals of Production with a capacity greater than 2 MW;
- c. Large Customers and Self-Producers that the DSO deems necessary

5.4.2 Procedures for operational communication and action

- 5.4.2.1** The DSO and the Users connected to the Distribution System must appoint a person and / or the location of the meeting place and agree on the forms of communication forms for the necessary exchange of information in order to make as much effective the exchange of information required by operating communication
- 5.4.2.2** SCADA equipment may be required at the User's site for the transmission of information and data to and from the Dispatch Centers of DSO or the TSO.
- 5.4.2.3** Information between the DSO and the User may be exchanged upon reasonable request by either party. The request may continue with a specific operation, or be in accordance with the previous agreement for the exchange of information for a special case. This may not impede the voluntary exchange of information which may be perceived as relevant (important) to the operation of the Distribution equipment or the User in accordance with good industrial practice.
- 5.4.2.4** In case of operation in the Distribution System or upon receipt of the notification for operation in the Transmission System, which may have or has, in the opinion of the DSO, any effect of the operation in connecting the equipment of the connected User in the Distribution System, the DSO must notify the User



5.4.2.5 In case of operation in the equipment of the User connected to the Distribution System which may have or has an effect of operation in the Distribution System, the User shall inform the DSO in accordance with the operating communication

5.4.2.6 Notification based on operational communication will have sufficient details to describe the operation, although it should not indicate the reason and enable the recipient of the notification to have as reasonable access as possible to the implications and risks that arise, but should to include the name of the individual reporting on the operation. The recipient may ask additional questions necessary to clarify the notice.

5.4.2.7 Notification based on operational communication should be given as soon as possible to allow the recipient to consider and assess the implications and risks that will arise.

5.4.3 Serious (heavy) Incidents

5.4.3.1 When any case in the Distribution System has had or may have a significant effect on the installation of the User or when any case in the installation of the User has had or will have a significant effect on the Distribution System, the case shall be considered as serious incident by the DSO, in consultation with the User. Serious incidents must be reported in writing to the affected group in accordance with the cases reporting provisions as in 5.5

5.4.3.2 Serious incident should include cases that result in, or may result in these:

- Voltage change outside the limit foreseen - allowed;
- System Frequency outside the limit foreseen - allowed; and
- Disruption of System stability



5.5 Reporting of cases

5.5.1 Purpose of reporting the cases

- 5.5.1.1** Case Reporting submits written reporting requirements for cases considered to be "Serious Incidents" based on operational communication. Information between the DSO and Large Users may be exchanged upon reasonable request by both parties
- 5.5.1.2** Cases reporting also describes joint analyzes of serious incidents from involving the User
- 5.5.1.3** Cases reporting objectives are to facilitate the preparation of more detailed information in writing and where agreement has been reached between the DSO and the User involvement, for the joint analysis of these reported serious incidents verbally based on operational communication
- 5.5.1.4** Cases reporting applies to the following Distribution System Users:
- Customers with unregulated prices connected to the Distribution System for whom the DSO deems necessary;
 - Independent generators / producers with a capacity greater than 2 MW;
 - Consumers with de-regulated prices and Self-Producer for whom the DSO considers necessary



5.5.2 Procedures for reporting of cases

- 5.5.2.1** The DSO and each User specified in paragraph 5.5.1 shall appoint an official and establish forms of communication to ensure the efficiency of cases reporting. Such officials and forms of communication may be the same as those established pursuant to paragraph 5.4
- 5.5.2.2** Communication should, as far as possible, be direct between the User and the Distribution System Operator. However, this will not impede communication with the nominated representatives of the User
- 5.5.2.3** In the situation of reporting the case to the DSO pursuant to paragraph 5.4 and previously designated by the DSO as the case of a serious incident, a written report must be submitted to the DSO by the User and vice versa, in accordance with paragraph 5.5
- 5.5.2.4** In the situation of case reporting previously reported to the User pursuant to paragraph 5.4 and previously designated by the DSO as a serious incident, a written report must be submitted to the DSO by the User in harmony with paragraph 5.5
- 5.5.2.5** As the case may be / appear, a report must be sent to the DSO or the User in writing in electronic form and this report must contain the confirmation of the notification given under paragraph 5.4 together with more information that has to be relate to the serious incident including information that has already been made known in the case of the serious incident since the announcement. The report must contain at least the issues specified in paragraph 5.5.4.
- 5.5.2.6** The report based on paragraph 5.5 shall be given as soon as possible and as practical as possible after the notification based on paragraph 5.4.



5.5.3 Joint Researches

5.5.3.1 When reporting a serious incident and submitting an incident report pursuant to paragraph 5.5, any group or all groups may request in writing that a joint analysis be performed

5.5.3.2 The composition of such a group should be appropriate to the incident to be analyzed and acceptable to all parties involved

5.5.3.3 The joint analysis will be done only when all parties are involved and agree on it. Forms and rules as well as procedures for all issues related to joint analysis should

5.5.3.4 agree at the time of analysis and in case of any dispute the joint analysis will not be performed

5.5.4 Written Report on Serious Incident

5.5.4.1 Issues to be included in the case of reporting to the DSO by Independent Producers are:

- a. Date and time of the Serious Incident;
- b. Source of information;
- c. Location;
- d. Equipment included;
- e. Personnel involved;



- f. Brief (short) Description of Serious Incident;
- g. Details of any control (research) request that has been undertaken; and
- h. Conclusions and recommendations that can be applied.

5.5.4.2 Issues to be considered by the DSO are reasonable effects on Users, including:

- a. Time Duration of the incident; and
- b. Estimating the date and time for return to normal work

5.5.4.3 Issues to be considered by Independent Producers are the effects that have an impact on Production, including:

- a. Production Interruption;
- b. Appropriate Frequency Achievement;
- c. Appropriate MVar achievement; and
- d. Estimating the date and time for return to normal work

5.6 Testing of System

5.6.1 Purpose and Objectives of System Testing

5.6.1.1 This paragraph sets out the responsibilities and procedures for arranging and performing a system test that has or may have an effect on the DSO system or on Users. System tests are those tests which include any simulated or controlled application of irregular, extraordinary or extreme conditions in the total system



or in any part of the total system but which do not include commissioning or re-commissioning tests or any other lower test

5.6.1.2 The objectives of system testing are:

- To ensure that the procedures for arranging and performing the system test are such that, as far as practicable, the system tests do not endanger the safety of personnel or people and that they do not cause the slightest / minimum disturbance to the security of supply, plant / facility integrity or equipment and are not harmful to the DSO and Users; and
- Sets out the procedures that follow with setting up and reporting the system test

5.6.1.3 System testing is used for the following Distribution System Users:

- a. Customers with unregulated prices connected to the Distribution System for whom the DSO deems it necessary;
- b. Independent generators with a capacity greater than 2 MW; and
- c. Consumers with unregulated prices and those Self-Producers for whom the DSO thinks it is necessary

5.6.2 System Testing Procedures

5.6.2.1 If the system test proposed by the DSO or by the User connected to the Distribution System and if the test has or will have or may have an effect on the Transmission System, then the provisions of the transmission system testing shall apply or of Grid Code



- 5.6.2.2** System tests that have minimal effect on the Distribution System or other systems will not be subject to these procedures; the minimum effects shall be calculated on the average variations of voltage, frequency and waveform distortions for a value not exceeding those defined in this CODE and Distribution System Planning.
- 5.6.2.3** When the DSO or Users attempt to perform a system test which may have a significant effect on the system of others, notice must be given 12 months in advance, or as agreed / as it was agreement with the DSO, and must to be given by the person proposing the system test (test proposer) to the DSO or to the Users who may be affected by such a system test
- 5.6.2.4** The proposal must be made in writing and must contain details of the nature and proposal for the test of the proposed system and must affect / influence the dimensions and condition of the plant / facility or equipment included in it.
- 5.6.2.5** If the information contained / placed in the proposed advance notice is deemed insufficient by the recipient, then they should contact the test proposer with a written request for further information to be provided as soon as possible and practically reasonable. The DSO is not required to do anything under paragraph 5.6 until it is satisfied with the details given to you in the proposal or in the subsequent request for further information
- 5.6.2.6** If the DSO wishes to conduct the system test, the DSO shall consider that it has received the proposal for the system test
- 5.6.2.7** The DSO shall have full coordination of the system test, using the information provided to it pursuant to paragraph 5.6, and shall identify the reasonable assessment that other Users and not the test proposer may be affected by the proposal of the system test



- 5.6.2.8** Following the acceptance of the system test proposal, the DSO shall evaluate the impact of the system test and discuss the proposal with the identified Users affected by this test
- 5.6.2.9** Within one month from the date of receipt of the proposal for the test of the DSO system must submit a report to the test proposer which must contain:
- a. Proposal for conducting the system test (including method how the monitoring will be done);
 - b. Account / calculation allocation between affected parties, (it is a general principle that the costs are covered by the test proposer); and
 - c. Other issues that the DSO deems appropriate, determines procedures to be followed and the proposed test schedule and advises on each account (calculation)
- 5.6.2.10** The proposal report must be submitted to all those who have received the advance notice pursuant to paragraph 5.6.2.3.
- 5.6.2.11** If the proposal report (or any amended proposal report made in the agreement between the DSO and the test proposer) is accepted by all recipients, the system test may continue further
- 5.6.2.12** At least one month before the proposed system test date, the DSO shall submit to all recipients of the announced proposal a program which in paragraph 5.6 will be called the final test program showing the disconnection sequences and schedule their, list of all workers involved in conducting the system test (including those responsible for site / workplace safety) and other issues that the DSO deems relevant / important.



- 5.6.2.13** The final test program must oblige all recipients to comply with the obligations set forth in the program in relation to the system test proposal.
- 5.6.2.14** Upon completion of the system test, the test proposer shall be responsible for preparing the written report ('final report') of the system test for submission to the DSO
- 5.6.2.15** The final report shall include a description of the Facility and / or equipment tested and the system test performed together with the results, conclusions and recommendations
- 5.6.2.16** Test results should be reported to relevant parties, taking into account confidential matters (issues).
- 5.6.2.17** All systems test procedures must be adapted to the legislatures used

5.7 Monitoring, Testing and Research

5.7.1 Purpose of Monitoring, Testing and Research

- 5.7.1.1** In order to perform its responsibilities properly (regularly) taking into account the security, functioning and economic operation of the Distribution System and in accordance with the terms of the license, the DSO must organize and perform monitoring, testing and analysis of the effect of electrical equipment of User or its Facilities in the Distribution System
- 5.7.1.2** The objective of monitoring, testing and research is to specify DSO requirements for testing and / or monitoring the Distribution System to ensure that Users do not operate outside the technical parameters required by the General Conditions and Operation of the Distribution System.
- 5.7.1.3** Monitoring and testing is used for the following Distribution System Users:



- a. All Independent Producers connected to the Distribution System; and
- b. All Customers who are connected to the Distribution System

5.7.2 Monitoring, Testing and Research Procedures

- 5.7.2.1** The DSO shall from time to time determine the need for testing or monitor the quality of supply at various points in the Distribution System
- 5.7.2.2** Requests for specific testing and / or monitoring may be initiated by recipients of specific complaints due to the quality of supply in the Distribution System
- 5.7.2.3** When testing or monitoring is required at the Connection Point with the User then the DSO should advise the User involved as well as present to the User the results of such test.
- 5.7.2.4** When the User operates outside the technical limits set out in the Distribution Code then the User must correct the situation or immediately disconnect the apparatus causing problems from his apparatus, which is connected to the Distribution System or within the time deadline as provided in agreement with the DSO.
- 5.7.2.5** The constant repetition of irregularities and not readiness or inability to improve such a situation, will result in the User being disconnected in accordance with the Connection Agreement
- 5.7.2.6** The DSO should from time to time monitor the effects of the User on the Distribution System
- 5.7.2.7** Monitoring is mainly done in relation to Active, Reactive Power or oscillations, harmonics that are transferred along the Connection Point.



5.7.2.8 When Users export or import Active and Reactive Power in bulk / mass other than as specified in the Connection Agreement or cause irregularities, the DSO shall inform the User and the User shall limit the transferred power according to the specified parameters

5.7.2.9 The DSO shall check, from time to time, that Users act in compliance with the requirements of the protection agreement and protection recommendations.

5.8 Industrial Safety Standards (Norms)

5.8.1 Purpose and Objectives of Industrial Safety

5.8.1.1 Industrial Safety Norms specify the criteria for the safety management system to be used by the DSO, in order to meet the requirements, on the terms and obligations of the DSO License

5.8.1.2 Similar criteria and standards for the security management system must be met by other Distribution System Users when performing work or testing at the connection place (connection point) with the DSO

5.8.1.3 The objective of security coordination is to establish security management criteria that will be used to ensure / guarantee the safety of persons operating / working in the Distribution System or across Property Boundaries.

5.8.1.4 Security norms specify the security management criteria used by the DSO and for Distribution System Users such as:

- a. All Independent Producers;
- b. Customers with unregulated prices



- c. Any other party that is reasonably specified by the DSO including Low or Medium Voltage Connected Users for sections appropriate to safety standards / norms when necessary; and
- d. DSO Inspector or User in the Distribution System or across property boundaries

5.8.2 Industrial Safety Procedures

- 5.8.2.1** Principles and procedures of safety management (safety management system) to ensure the health and safety of all relevant personnel, should be specified by DSO and Users for work in their systems or Facilities or equipment belonging to them
- 5.8.2.2** There should be a joint agreement between the DSO and the Users, where the safety management system will be used for the workshops where the property boundaries exist and the documentation of the security measures to be taken and maintained
- 5.8.2.3** An authorization must be written for personnel performing inspection, operation, or other work as well as testing of plants (facilities) or equipment that form part or are connected to the Distribution System.
- 5.8.2.4** There should be a joint agreement between the DSO and the Users, specifying responsibilities for the system or equipment control that will ensure / guarantee that only one party is responsible, for each part of the plant or related equipment at all times.
- 5.8.2.5** The DSO and each User must at all times appoint a person or persons to be responsible for coordinating security in the respective systems.
- 5.8.2.6** The DSO and each User shall maintain an appropriate documentation system which records all relevant operations that have taken place in the Distribution



System or other systems connected to it and the coordination of measures taken relevant to the security of the work

5.8.2.7 Diagrams showing sufficient information about the control personnel who will perform their duties should be exchanged between the DSO and the Users as required.

5.8.3 Safety at the connection place / User Connection Point

5.8.3.1 The following procedures establish the basic requirements for operational safety at the point of connection with the DSO. These procedures are necessary to ensure the safety of all those who can work on either side of the connection point or in connection point (at the dividing border).

- a. Written rules for safety at work and communication procedures should be available and used by all persons who may work at the point of connection or who use the equipment at the point of connection;
- b. Electrical equipment connected on both sides of the connection point and connection point equipment must be under the control of the authorized person on both sides;
- c. Each piece of equipment must be controlled by only one identified person at any time;
- d. Adequate insulation measures must be provided at the connection point, so that work can be carried out safely on both sides of the connection point;
- e. When it is necessary to avoid danger, adequate earthing equipment must be provided on both sides of the connection point to enable work to be carried out safely at the connection point or on both sides of the connection point;



- f. Adequate working space, adequate access and exit measures and, where necessary, adequate lighting must be provided for work performed on all electrical equipment that may cause danger;
- g. All electrical equipment should be identified as appropriately when necessary to avoid danger; and
- h. Electrical installations and equipment must meet all relevant statutory requirements

5.8.4 Industrial Safety Rules

- 5.8.4.1** Operation and maintenance of Users equipment should be performed only by authorized personnel. Prior to the first commissioning of the Plant, the procedures of operation must be arranged with the DSO
- 5.8.4.2** Instructions for operation and / or earthing of Users electrical equipment must be clearly displayed (seen) in the Low and Medium Voltage Users switchers / breakers room
- 5.8.4.3** Safety Rules (Transmission, Distribution and Users) define the safety procedures to be applied to all personnel working in or near the Distribution System of plants / switchgears or equipment

5.9 Security of Supply

- 5.9.1** Distribution System Security Standard is defined in "Security Standards of Distribution System and of Planning"
- 5.9.2** The DSO shall make reasonable efforts to maintain a continuous supply of each part of the system. This cannot be ensured if breakdowns, scheduled / planned maintenance and outages during new work and other circumstances are beyond the control of the DSO, which may cause disruptions / obstacles (unplanned



outages). In such cases, the DSO shall make reasonable efforts to restore the supply or connection as soon as possible, but shall not be liable for any direct or indirect damages or associated losses caused by the User

5.9.3 The categorizations for the different types of interruptions are as follows:

- a. Interruptions during breakdowns: The DSO will attempt to return the supply within twenty-four hours (24 h). Under exceptional conditions (big storms, floods, etc.) the outage / interruption time may be longer and in such circumstances the DSO will try to keep the User informed of the course / development of events
- b. Scheduled (planned) Outages (interruptions): The DSO will notify at least 48 hours in advance of planned supply interruptions, which occur due to planned repairs, reconstructions or new constructions in the Distribution system. In situations of emergency repairs, small and short-term (for local interruptions which affect a small number of customers) the notice should be given in shortest deadline [one day before the interruption or even interruptions during the same day]
- c. Supply Limitations: In some circumstances, it may be necessary to require customers to reduce the load or use backup supplies where appropriate. In these situations the DSO will try to provide access to that part of the system. In extreme cases when this would not be possible the DSO will endeavor to notify Users at least two days in advance
- d. Load adjustment (regulation): In exceptional situations there may be production interruptions and thus load adjustment may be required. If possible in these circumstances the DSO will notify consumers, but since such a situation is often an emergency situation this notification may not be possible. Also, this form of interruption can be applied in cases of lack of



energy produced and lack in its market, where the information of the Users will be regular.

5.9.4 The DSO may, under certain circumstances, disconnect customers from supply. These circumstances will include:

- a. When the installation of the customer or the use of electricity is such as to impede / obstruct the satisfactory operation of the Distribution or Transmission System or to cause interference / obstacles to other customers
- b. Where the DSO considers that the installation of the customer poses a risk
- c. Where alterations, repairs, renovations or maintenance of the Distribution System or DSO assets or means of connection require de-energization of the connection point.
- d. When the customer at unregulated prices enables the supply from his assets (by agreement) to another party (registered as a customer of the DSO) and the DSO considers it reasonable to terminate / interrupt him
- e. In any other circumstance in which the choice / solution is necessary or appropriate to enable the DSO to comply with the Distribution Code and operate the Distribution System in accordance with good industrial practice or as required by the Disconnection Rule, drafted by the Regulator
- f. When we have a request from the Supplier with which the User has an agreement, to interrupt the regular supply of electricity, in accordance with the legislation in force



Chapter VI

6. *Register of Technical Data*

6.1 Introduction

- 6.1.1.** Various sections of the Distribution Code require Users to submit technical data to the DSO
- 6.1.2.** The Technical Data Register provides a general presentation of all information requests of a particular type. Each User refers to the appropriate presentation to display the total data required for each case
- 6.1.3.** The RDhT specifies the procedures and time for data supply and periodic time after time updating. Then when the time is specified with an exact schedule in the other sections of the Distribution Code, it is not necessary to repeat the entire RDhT
- 6.1.4.** In case the Producer requests to be connected to the Distribution System, then the arrangement for the time schedule and the discussions for connection, should be done with the DSO

6.2 Scope

6.2.1 Users for whom the Section is used for RDhT are:

- ❖ Independent Producers
- ❖ Customers at unregulated prices; and
- ❖ Medium Voltage Consumers where the DSO deems it necessary



6.3 Procedures and Responsibilities

- 6.3.1** Unless otherwise specified or agreement reached with the DSO, each User must submit the data as defined in 6.4 and according to the schedule determined / given
- 6.3.2** Data changes are reviewed on an annual basis to ensure / guarantee consistent or relevant accuracy. The DSO should initiate this review in writing and the Users should respond in writing.
- 6.3.3** When the potential data must be submitted in standard form are sent to the User by the DSO.
- 6.3.4** If the User wishes to change any part of the data then it should first be discussed with the DSO in order to consider the implications and changes. If compliance has been reached, confirm by submitting the revised data form with written confirmation
- 6.3.5** From time to time the DSO may change data requests, Genuine Users should be advised of these changes as they occur and with a time schedule for return of answer.

6.4 Data to be Presented

- 6.4.1** The naming method should be the same as the naming method in the Grid Code and Distribution Code and some of these designations / naming will not be required
- 6.4.2** Data List I (a), I (b), and I (c) - Technical Information of Independent Producers
- 6.4.3** Data List II- Demand Forecast - As described in Chapter 7, Demand and Production Forecast for Users defined in that scope
- 6.4.4** Data List III (a) and III (b) - Operation Planning - as described in Chapter 7, information on planned outages (interruptions)



6.4.5 Data List IV (a) and IV (b) - System information design - includes system technical data

6.4.6 Data List V - Load Characteristics - includes data foreseen for load points showing e.g. maximum load, devices that include the load and the composition of the load harmonics

Number of list	Title	Use for:
List I(a)	Generation Units Combined units	Independent Producers including Unregulated prices Customers and Self-Producing Customers.
List I(b)	Generation Units	Independent Producers with parallel operation
List I(c)	Generation Units	Independent Producers > 2MW.
List I(d)	Generation Units	For all Wind Generators
List I(e)	Generation Units	For Wind Generators, less than 5 MW
List II	Forecast of load	Independent Producers > 2MW; Industrial consumers with unregulated prices
List III(a)	Planning of operation (interruption)	Independent Producers
List III(b)	Planning of operation (Switchgear / facility and equipment)	Large Customers at Unregulated Prices, Independent Generators and Self-Producing Customers
List IV(a)	Design of system	Independent Producers; Customers at unregulated prices MV customers if advised by the DSO
List IV(b)	Design of system	Independent Producers if working in Parallel;
List V	Load Characteristics	Independent Producers; Customers at unregulated prices



6.5 List of Planning Data

6.5.1 The list of planning data used for each group of Users is given below:

6.5.1.1 List I (a) of Planning data

Production Units Data for all Independent Producers including Customers at unregulated prices as well as Self-Productive Customers

Data Description	Units
Details of location for Construction	Text
Contactor Name	Text
Generator Model	Text
Type of Production Unit	Text
Turbine type	Text
Operating mode / regime forecast	Text
Voltages in the generator bushings	kV
Nominal power	kVA
Nominal active power	kW
Maximum output active power	kW
Maximum output reactive power	kVAr
Short Circuit Level Contribution	MVA
Voltage Control Method	Text
Transformer Block Details	Text

6.5.1.2 List I (b) of Planning data

Production Unit Data, for Independent Producers with Parallel Operation

Data Description	Units
Engineering details should include:	Text / Schematic diagram
Relevant Voltage Level	
Size of the Generator and windings configuration	



Transformer size, power, short circuit impedance, voltage quotient, and winding configuration	
Location of circuit breakers	
Maximum value of three-phase short circuit	kA
Location of alternative supplies	
CT's / VT's quotient and locations	
Arrangement on synchronization	
Relay types and location	
Power Factor correction location	
Inertia Constant	sek
Stator resistance	Relative unit
Direct Shaft Reactance: • Sub-transient • Transient • Synchronous	Relative unit
Time Constant: Direct Axis • Sub-transient • Transient	sek.
Sequential null: • Resistance • Reactance	Relative unit
Negative Sequence: • Resistance • Reactance	Relative unit
Block transformer:	
• Resistance • Reactance • Nominal power • Voltage regulator arrangement • Connection group • Earthlink of the Neutral (Star)	Relative unit Relative unit MVA
The value of the current that occurs due to the short metal connection to the main circuit breaker	Paper for calculation



Arrangement of connection point	Text / diagram
Details of the Protection Circuit as well as Supervision of Circuit Breaks	Text / diagram
Details of Relays to be used including range, proposed setting and calculation to be used for relay placement	Text
Power Regulatory Factor Details	Text / diagram

6.5.1.3 List I (c) of Planning data

Production Unit Data, for Independent Generators > 2 MW

Data Description	Units
Turbine type	Text
Visible power	MVA
Type of excitement	Text
Automatic Voltage Regulator (AVR)	Diagram
Model block diagram for Reg. Automatic of voltage including data on amplifier time constant and reactive as well as voltage control limit	Text
Speed regulator as well as turbine data	Diagram
Block diagram for the model of the power plant generator speed regulator showing the details of the regulator, control system, turbine rating as well as Maximum Power	Text
Rated / nominal active and reactive (capacity) power per unit as well as for the whole generating plant	MW MVA _r
Minimum active and reactive power for the generating units as well as for the whole generating plant.	MW MVA _r
Demand for own costs / expenditures for generating units as well as for the entire generating	MW MVA _r



plant at minimum production conditions.	
Demand for own costs / expenditures for generating units as well as for the whole generating plant in normal production conditions (registered)	MW MVar

6.5.1.4 List I (d) of Planning data

Production Unit Data, for Centrals of Wind Generator, For All Wind Power Generators as well as those with Dynamic Models [Alternatively, Wind Power Generators with Registered Capacity <5 MW must submit the data laid down in List I (e)]

Data Description	Units
Dynamic Model	PSS / E format (or other format in accordance with OST)
Dynamic Model Parameters	As required by the dynamic model or
Dynamic model submitted to the DSO or TSO	
Title / version of dynamic model	
Data Submitted to the TSO / DSO	
From whom they were sent	
Where they are addressed	
Ways of Addressing	



6.5.1.5 List I (e) of Planning data

Production Data, for Wind Power Generators with registered capacity < 5 MW for Dynamic Models of Equipment (Unit), when the data specified in Planning I (d) are not provided (presented).

Data Description	Units
Wind Power (central) Technology	Stable fixed speed adjusted Fixed pitch speed adjusted Fixed pitch speed adjusted with variable rotor resistance Variable speed with dual feed induction generator Variable speed with synchronized generator and fully rated converter Other
Wind Central Producer	
Type of Wind Central	
Producer of Generator	
Generator Parameters	As specified in Planning List I (b)

6.5.2 List II of Planning data

- 6.5.2.1 Production Forecast for, (A) Production Units > 2 MW which are not subject to the National Dispatch Center
- 6.5.2.2 Demand Forecast for B) Customers at unregulated prices and Medium Voltage Customers for whom the DSO deems appropriate



Data Description	Year						
	0	1	2	3	4	5	6
Receiving Power (maximum active power in MW - 15 minutes) and Power factor							
Annual Energy Demand (MWh) Forecast							
Planned Interruptions Periods Date: Commencement of Interruptions							
Planned Interruptions Periods Date: End of interruptions							

Remark: Year 0 is actual year

6.5.3 List III (a) of Planning Data, Operation Planning - Interruption Planning for Independent Producers

Data Description	Units	Time Period	Type of data
For Individual Production Units unit number and Production Capacity of the Central. Date of commencement of work and date of completion	MW	0 to 52 weeks	Program suitable of interruptions
For Individual Production Units unit number and Production Capacity of the Central. Earliest start date and latest end date	MW	Years 2 to 3	Program Provisional of interruptions
For Individual Production Units unit number and Production Capacity of the Central. Earliest start date and latest end date	MW	Years 4 to 7	Program Indicative of interruptions



6.5.4 List III (b) of Planning Data, Operational Planning for Equipment, For Independent Producers, Customers at Unregulated Prices, and Self-Producing Customers

Data Description	Units	Time Period
Users provide to DSO with details of outage /interruption planning that may affect Distribution System performance, Interruption test details, interruption risk and other information where known to affect Distribution System security and stability	Time dates	0 to 52 weeks
Users provide DSO with details of outage / interruption planning that may affect Distribution System performance, Interruption test details, interruptions risk and other information where known to affect the Distribution System security and stability	Time dates	Years 1 to 2

6.5.5 List IV (a) System Design Information, for Independent Producers and Customers at Unregulated Prices if suggested by the DSO

Data Description	Units
<i>Reactive Compensation</i>	MVAr
Reactance of any Capacity or Cell and any reactance connected in series	relative unit
The value of each reactance shunt separately	MVAr
<i>The individual value of each Capacitive Cell</i>	MVAr
Details of any logical, automatic controls such as operating characteristics that can be defined	Text/ Diagram
<i>Connection points in the system</i>	



<i>Equivalent Network susceptance</i>	relative unit
Details of equivalent network susceptibility referred to in the Distribution System connection include: Shunt reactors that are an integral part of the cabling system, with the exception of out-of-operation cables. While they do not include: Reactive compensations with independent disconnection connected to the User system and any suspense which is part of the active and reactive load of the User	
Short circuit current sources	
X/R quotient at maximum and minimum conditions of short circuit current from all contributors (electric machines)	R+jX
Information on the equivalent network impedance required by the DSO	
Interconnection impedance	

6.5.6 List IV(b) System Design Information, for Independent Producers Operating Parallel to the System

Data Description	Units
Interconnection Impedance	
Positive Sequence Resistance	%
Inverse Sequence Resistance	%
Zero Sequence Resistance	%
Susceptance	
If the DSO considers the impedance to be low, then more data should be required	
<i>Circuit parameters</i>	Text /Diagram
Breakers	Text /Diagram
Protection arrangement	Text /Diagram
Terms of Establishment of Protection	
Transient Effect of Overvoltage	



6.5.7 List V Load Characteristics For Independent Producers and Consumers at Unregulated Prices

Data Description	Units
Types of request:	
Maximum Active Power Demand	kW
Maximum and Minimum Reactive Power Requirements	kVAr
Load Types and Control Arrangement	Text /Diagram
Type of stimulus use; Controlled Re-Directors; Large Engine / motor Commanders;	
Maximum phase load when the load is:	Amp / phase
Maximum	
Maximum phase imbalance	Amp / phase
Maximum harmonic composition (harmonic number)	%
Fluctuating load:	
The value of the change of active and reactive power with increase and decrease	kW/Sec kVAr/Sec
Shortest repetition interval between active and reactive power	Sec
The biggest step of change in active and reactive power in ups and downs	kW kVAr
Disorder Load	Text



Chapter VII

7. *Determination of Terms and Definitions*

7.1. Description and explanation of naming's, abbreviations and definitions

7.1.1. In the **Distribution Code** the words and expression used will have the meanings as below:

Term	Definition
AC	Alternating (alternative) Current / Voltage
Distribution System Applicants	Legal person, current or future User of the Distribution System applying for permission to connect to or modify the existing connection to the Distribution System
Applications for connection to the Distribution System	Documents filled by potential Users that require access for connection to the Distribution System , or by existing User to modify the existing connection. In order to receive the DSO approval for connection. Relevant required documents are prepared according to the Code provisions
AKS	Kosovo Standardization Agency within MTI
DC	Current / Voltage One-Way
Defects	Defect is a phenomenon that occurs due to internal and external reasons and causes deformation of electricity parameters or interruption of operation for a certain period of time, of one or more elements, which in turn lead to interruption of supply with electricity
Special Defects	Rare defects of large and unexpected proportions for which



	in most cases users do not apply adequate protection
Demarcation	Permitted limits of movement of persons in power facilities
Load diagram	Load curve during every hour (00 - 24 hours) for one day, or another period (15 min.) for a customer, direction or plant, etc. Or for a period longer than one day
Visible Energy	Visible Energy means the Visible Power integral in respect of time measured in VA and its multiples (for one hour or VAh)
Active electricity	Active Electricity (kWh and its manifolds) is the active power that is generated or passed to an electrical circuit over a time interval, being the definite integral of active power with time limits
Reactive Electricity	Reactive Electricity (kVArh and its multiples) is the set integral with time limits of reactive power
Power Factor	Ratio between active electric power (kW) and apparent electric power (kVA) symbol ($\cos\phi$). The minimum allowed value of $\cos\phi$ is 0.95.
Nominal Frequency	Number of alternating current periods per second expressed in Hz. The frequency at which the system normally operates is 50 Hz
Visible (Apparent) Power	Visible power means the output / production of the effective value of current and the effective value of voltage. For AC system circuits it represents the square root of the square of the active and reactive power multiples, measured in kVA
Electrical Generator Installed Power	Nominal capacity of active power that can be given by an Electricity Generator based on the generator documentation (generator certificate), which is written on the relevant generator / producer label



Active Electric Power	The product of the voltage, current, and cosine of the angle between them. $P = (U \times I) \times \cos\phi$ or the rate at which energy is transferred in (kW and its multiples)
Reactive Electric Power	The product of the voltage and current and the sine of the phase angle between them. $Q = (U \times I) \times \sin\phi$, in (kVAr and its multiples)
Maximum Power of Electric Generator	The maximum possible power that the Electricity Generator is able to give under certain mechanical and electrical conditions.
Supplier	Energy company / enterprise licensed to carry out the supply activity
Producer (Generator)	A natural or legal person that produces electricity
Electrical Producer	A set of buildings with certain mechanical and electrical equipment, which have as basic destination the Production of Electricity
Producer Connected to SSh Network	Electric Generator with Generation units directly connected to the Electricity Distribution Network
Independent Producers	The person or company that generates electricity, including customers with Self-Producers, who are directly connected to the DSO Distribution System
Harmonics	Sinusoidal currents (voltages) with the same frequency and with numerical multiples of the nominal frequency
Technical Losses of Energy	The technical loss of Electricity in a network element represents the difference between the Electricity entering the element and the Electricity leaving the element.
Isolated	The process of achieving disconnection of the device from a part of the system.
IEC	International Electrotechnical Commission



Injection from the Transmission Network	Transmission of Electricity in the Distribution System from the Transmission System to the connection points between them
Distribution Code	It is the set of technical rules and procedures for the operation, maintenance, planning and development of the distribution system, as well as set the terms of service provided by the distribution system operators for its Users
End customers (tariff)	Electricity consumer who buys electricity for his own use.
Customer with unregulated prices	The final / end customer who does not have the right to be supplied with universal service according to the legislation in force
Self-Producing Consumer	is the consumer of electricity who at the same time and in the same location is the owner of the micro-generator of RES, connected to the network and with the right of self-consumption of the generated electricity as well as the sending of the surplus of electricity generated at the supplier
KQKO	Governing Commission of Operational Codes
Limits of Ownership	Boundaries between Distribution System and User Owned Equipment
Event Conditions	Operating conditions for a particular electrical installation (device) with one or more defects that damage the operation of the Distribution System or interrupt the electricity supply
Technical Conditions for Connection	Technical criteria defined in the Energy Consent issued by the DSO that allows the connection of the applicant's electrical facilities with the Distribution System



KVA	Kilo Volt - Ampere
Connection	Connection between two facilities / systems or Distribution System Users
License	is a right granted to a person-company to exercise an activity in the electricity sector, in accordance with the provisions of the Law on Energy, the Law on Electricity and the Law on the Energy Regulator
Short connection / circuit	Short circuit is the occurrence due to various damages or wrong actions connecting the elements between two points with different potentials
Law on electricity	It is the current law approved by the Assembly of the Republic of Kosovo
Fluctuation (Oscillation)	Visual perception created by a slight fluctuation reflected in illumination or whose spectral distribution fluctuates over time passing
Voltage Fluctuations	A series of rapid voltage changes that can be regular or irregular
Connection Agreement	A bilateral (two parties) agreement between the DSO and each Distribution System User that contains all the conditions for connection to the Distribution System
Tariff Measurement	Electricity metering system consisting of metering equipment and data collection equipment, based on which the electricity supplier makes the calculation
Protection	Measures to prevent abnormal conditions in the Energy System, detection of defects and activation of alarms and signals giving, until the disconnection of the defective element
Support Protection	Protection system that will interrupt a circuit breaker or other mechanisms that interrupt the short-circuit current in



the absence of basic protection system protection operation

Maintenance

The process of all technical and organizational actions performed for the elements of the Energy System during the maintenance period in order to recover their reinforcement capabilities for the planned functions

MTI

Ministry of Trade and Industry

Separator

A mechanism that provides in the open position a visible disconnection of an electrical circuit

Planned interruptions

There are electricity supply interruptions / outages due to maintenance, investment, lack of generation, overload of elements of the Energy System, except when there is a forced interruption / outage

Interruptions because of defects in electro energy system

Interruption of electricity supply due to defects in the elements of the Energy System (such as lines, substation transformers, Generating units, etc.)

Circuit Breaker

A mechanical on / off device capable of interrupting currents in normal circuit conditions as well as transmitting and interrupting current for a certain period of time in special abnormal circuit conditions, such as those of a short connection circuit.

Load / Demand (consume)

Load is the rate at which electricity is distributed to or from a system or part of a system, expressed in MW and MVar (i.e. active power and reactive power)

Peak (MW)

Maximum load value in MW recorded within a specific time period

Maximum Load

The maximum load recorded means the maximum value in kW drawn at the metering point of the customer supply on his property during each time period of 15 minutes as



determined by the Regulator

Maximum Simultaneous Load	For a certain period of time (a period of 15 minutes, the sum of all individual loads for all exchange points in the SSh results in the simultaneous load of the DSO. For one month (30 days this would be calculated at time intervals of 15 minutes as: $4 \times 24 \times 30 = 2880$ periods)
Irregular Loads	Loads that have the potential to create harmonics, fluctuations or imbalances (missing balance) in the system
Event	An unplanned or unspecified event that occurs in the System, which includes the general description; defects, incidents and destructions.
Production Unit	Any Generation Unit that Generates Electricity
Norms	Standards, codes, rules, decisions and other normative documents established by laws, by-laws acts, regulations, orders, other official documents and contracts
Power Sector Facilities (objects)	A complex of structures, buildings and various equipment projected to generate, transmit and distribute electricity
Market Operator	It is the licensed legal person that is responsible for the organization and administration of the electricity market and the final reconciliation between Producers, suppliers and consumers.
Operation	A planed action conducted in the Distribution System
OSSh (DSO)	Means the Distribution System Operator who is a natural or legal person who is responsible for the operation, provision, maintenance and development of the Distribution System that ensures that the system meets the needs for electricity distribution.



OST (TSO)	Means the Transmission System Operator, which is a natural or legal person responsible for the operation, maintenance and, as necessary, development of the transmission network in a given area including, where possible, interconnectors with other systems, and to guarantee the long-term ability of the grid to meet the requirements for electricity transmission
Earthing Equipment	A Fixed or Portable equipment for providing a secure connection between a conductor and earth
Parties	A Generator, Trader or other parties that are user of Distribution System
Tracking the Load Data	Follow up of Load Data is the database of load value defined in W, Var or VA (with their multipliers) for each undetermined time interval
Distribution System User	Suppliers, Generators (producers) connected to the Distribution Network, End Customers directly connected to the distribution network as well as any other natural or legal person who benefits from the distribution network services
Main Users	The main users are: Generators with installed power over 100 kW directly connected to the Distribution System and also all the clients connected to the medium voltage level of the Distribution System
Period of Load	Load period means the period during which active, reactive or apparent power are integrated so as to produce the average value of the load. For the purposes of the agreement each load period must be on time extension of 15, 30 or 60 minutes and which will start from hour 0.00 and in accordance with the applicable tariffs



Connection point	Physical point at which installations of Distribution System User are connected to the Distribution System
Supply Point by the Transmission System	A connection point between the Transmission System and Distribution System or between the Transmission System and a User directly connected to the Transmission System
Metering Point	The metering point is the physical place where the electricity metering system is installed and where the metering system fulfils all the technical conditions and accuracy based on the Electricity Metering Code. Physical measuring point is established fully by the agreements between the parties
Joint Point	The point in the Distribution System that is electrically and technically closer to the Connection Point from where are connected or may be connected the loads of the other clients.
Dispute Procedures	Procedures described by the "Rule on resolution of disputes" approved by Regulator.
Independent Electricity Producers	Electricity Producers separated from the Electricity System that produce Electricity for their use, either for sale to specific customers or for sale in the Electricity System
Protocol	Protocol is the software used for information exchange with external equipment or equipment for exchange point
Access in the Distribution System	The right of Licensed subjects that generate or supply electric energy and also the right of electro energy customers to connect and to use the services of distribution system in compliance of legislation in power
National Dispatching Center (QND)	Center from where is done Operation and Supervision of Electro Energy System of Transmission TSO, internal and external with other systems outside Kosova, considering the



	programming and maintaining of operation security and the quality parameters based on technical conditions
Dispatch Center of Distribution (QDSH)	Center from where is done Operation and Supervision of Electro Energy System of Distribution of DSO in all territory of Kosova, considering the programming and maintaining of operation security and the quality parameters based on technical conditions
RAT (AVR)	Automatic Voltage Regulation
Special cases	Cases when we are dealing with major powers or resembling them, such as falls from the system of high capacities, exit from the system of a large region with high capacities and similar
Network of electricity transmission	Electricity Transmission Network in the 110 kV, 220 kV, 400 kV levels that facilitate the transmission of large amounts of energy in long distances
Short Connection Current	Current that circulates in a short circuit in a certain point of the electro energy System and that can be expressed in kA.
General Accuracy	Combination of meter accuracy, auxilliary equipment for metering transformers and also the conductors for metering system.
SCADA (Supervisory Control and Data Acquisition)	A acronym for Supervisory Control and Data Acquisition, computerized system in real time that is used for monitoring and checking the transmission system in real time.
Electro Energy Sector	Unity (community) of activities of planning, development, construction, use and maintenance for installation of centrals of production, transmission, distribution, systems /objects of customers with deregulated prices, suppliers of electricity and lines of interconnection for import-export,



Potential User	transit and exchanges with neighboring countries.
Distributor of electricity	Any person or legal subject holding the Distribution license for electricity according to the legislation in force, with a voltage level lower than 110 kV
Distribution	Is the transportation of electricity to the distribution system of mid and low voltage, considering the distribution to the end customer.
Reviewing (commissioning)	The finishing of testing process of a part of Distribution System before that part is the System to get operational.
Computerized Basic System	Basic Computerized System means the using of data that are downloaded from measuring meters through Data Gathering Center or through communication network from distance and downloads in Standard Format so that later to be used for calculation, analyze and various presentation.
Distribution System	Distribution System at 220/35/20/10 kV substations, 110/35/20/10 kV includes : all 35 kV exit cubicles and 10(20) kV, (except MV transformer cubicles and the bus bars own expense) connection/disconnection equipment and all following separately elements, earthing, metering the protective low voltage level and MV owned DSO. Also all system elements medium and low voltage (35 kV, 10(20) kV, 6.3 kV and 0.4 kV with respective transformations) up to the metering point (MP) customer or generator, including MP.
Transmission System	Power / electricity network owned by TSO.
High Voltage	Voltage level from 110 kV and upper.



Medium Voltage	Voltage level from 35 kV to 1 kV
Low Voltage	Voltage level below 1 kV.
CT's and VT's	It is understood the metering current transformers (CT) and metering voltage transformers (VT)
Earthling	A way of providing a safe connection between conductors or electric equipment and earth, through an earthling device
Transforming Station (Substation)	The Complex of electrical facilities, who's function is to transform and transferee the Power (electricity) from one network to another with different voltage levels
Electricity Market	The commercial electricity trading arrangements in Kosovo in accordance with the Law on Energy and Law on Electricity
Operation Order	Mandatory order for the receiving unit issued by the National Dispatch Center or by Dispatching Center of Distribution according to regulations in force. Orders are transmitted by phone and fax of after the installation of SCADA system through digital messages.
Operation Action	Actions from the unit receiving the Operative Order issued by the National Dispatch Center or Distribution Dispatch Center as well as programmed actions from the Parties affecting the Power (energy) System functioning
Regulator	Energy Regulatory Office