Pursuant to Article 114 of the Energy Law (Official Gazette of Montenegro, no. 5/2016, 51/2017 and 82/2020), and Article 45 paragraph 1 item 14 of the By-Laws of Crnogorski elektroprenosni sistem AD no. 10-00-6799/1 of 26 June 2018, the Company's Board of Directors, at the meeting held on _____ 2021, determined the following

TRANSMISSION GRID CODE

I. GENERAL PROVISIONS

Subject

Article 1

The Transmission Grid Code (hereinafter referred to as the Code) shall govern electricity transmission system operation (hereinafter referred to as the transmission system) in accordance with the Energy Law (hereinafter referred to as the Law) and Law on Cross-border Exchange of Electricity and Gas.

Article 2

This Code shall establish:

1) technical and other requirements for the connection of users to the transmission system, which include minimum power or capacity,
2) technical and other requirements for secure operation of electric power system with the aim of supplying consumers with electricity of the required quality,
3) general requirements for transmission system use,
4) rules for the access to the transmission system,
5) rules for system balancing,
6) criteria for and the modalities of the provision of ancillary services,
7) operation in emergency situations,
8) technical and other requirements for transmission system connection and operation in interconnection,
9) modalities of the transmission system development planning,
10) standard contracts which are concluded by transmission system operator (hereinafter referred to as TSO) with transmission system users,
11) functional requirements and accuracy classes of metering devices, as well as modalities of electricity metering,
12) modalities of publication of data necessary for the market operation and for the provision of data to system operators,
13) modalities of giving priority to the exploitation of domestic sources of primary energy for electricity generation where such obligation is stipulated by Energy Balance,
14) modalities of giving priority in access and takeover of electricity generated from renewable sources and high efficiency cogeneration and
15) manner and procedure for connection of users to the transmission system that includes non-discriminatory procedures for connection to the system for different types of users.

Conditions, criteria and requirements significant for electricity transmission system operation arising from operation in interconnection shall be governed by regulations in accordance with the Law on cross-border exchange in electricity and gas.

Area of Implementation

Article 3

The Code shall apply to:

1) transmission system, and
2) parts of facilities and networks 110 kV and higher voltage levels owned or entitled to be used by transmission system users.

Article 4

TSO, transmission system users and other natural and legal persons that in accordance with the Law and the Rules exercise rights and obligations of importance for the functioning of the transmission system shall apply the Code.

Terms and Abbreviations

Article 5

Unless the context or the purpose require otherwise, all terms defined in the Law shall have the same meaning as in this Code.

Abbreviations

Article 6

The Abbreviations used in this Code shall have the following meaning:

ARS	Automatic Re-closure
AGC	Automatic Generation Control
CBA	Cost Benefit Analysis
EPS	Electric Power System
ENTSO-E	European Network of Transmission System Operators for Electricity
IEC	International Electro-technical Commission
SCADA	Supervisory Control and Data Acquisition – System for Real-Time Control

Terms

Article 7

Terms used in this Code have the following meanings:

Agency	Energy and Water Regulatory Authority of Montenegro;
Balancing	The process which, by increasing or reducing the production and /or consumption of electrical energy in real time, maintain a balance between production and consumption in real time;

Balancing energy	Electricity ensured by TSO in order to balance the available electricity with the demand;
Balance responsibility	Responsibility of balance responsible parties for the deviation of their own plan of delivery and reception of electricity established by the exchange program and for unbalanced exchange program;
Balance responsible entity	Electricity market participant that has the obligation to participate in the system of calculation of quantitative deviation of electricity delivery and reception from exchange programs, implemented by the market operator;
Balancing market	Market that is established and operated with the aim of sale and purchase of balance energy;
Balancing group	Association of balance responsible parties with the aim of joint account of deviations, which makes them the parties of settlement of the given balance group. Balance responsible parties associated in the balance group appoint the holder of balance responsibility for the balance group;
Power exchange	Legal entity that organises and manages the power exchange market;
No-voltage start-up (black-start)	Capability of a generating unit to start-up from shutdown, return to the operational regime and start delivering the power when part of transmission system to which it is connected is without voltage;
Imbalance	Deviation of EPS operation, balance group or balance responsible entity from the exchange program, i.e. the difference between the available energy (generation and import) and total demand (consumption, export and system losses);
Direct consumer	End user directly connected to the transmission system;
Dispatcher	Person i.e. responsible professional in the dispatching centre, authorized by TSO to give dispatching instructions;
Dispatch instruction	Instruction i.e. operations order issued by TSO (dispatcher) related to the operation of generation units, transmission and user systems, including the use of ancillary services;
TSO dispatch centre	Centre for operational monitoring and control of transmission system operation and it refers to the National Dispatch Centre/Redundant Dispatch Centre;
Dispatching	Control of power flows in the transmission system, including the exchange with other systems;
Partial blackout	Situation in which in part of the transmission system there was a power outage caused by a failure of certain system elements;
Electric power system	In the technical sense, the set of generation facilities, transmission and distribution system elements (lines and transformers) and end users mutually connected so as to allow generation, transmission, distribution and consumption of electricity;

Frequency deviation	Deviation of the real from the system frequency set;
System losses	Active energy losses in transmission system elements;
Cold reserve	Generation unit made available to the central control by TSO, ready for operation and if required may be synchronized (made operational) within a certain period of time;
Connection infrastructure	A set of lines, equipment and devices between the existing electricity transmission system and a connection point;
Control (regulation) area	Coherent part of an interconnected system operated by one TSO, with physical loads and generation control units connected within the control area;
Control (regulation) block	One or more control areas that coordinate the regulation with respect to the rest of the connected system;
Block coordinator	Transmission system operator responsible for coordinating the operation of the control block in accordance with the contract on the block itself and the Code;
User system	Any user-owned system controlled by the user;
Transmission system user	A natural or legal person that delivers electricity to the transmission system or takes over electricity from it;
End customer	Customer who buys electricity for his/her consumption;
Customer	Natural or legal person that buys electricity for own consumption or further sale;
Metering system	Equipment necessary for metering and transmission of data located between a metering point and the data storage server;
Metering (instrument) transformer	Voltage or current transformer;
Metering device	Meter i.e. device that meters and registers generation, consumption and exchange of electricity;
Metering point	Point where electricity is metered;
Connection point	The point of connection of the transmission and distribution system, as well as the point of connection of the internal installation of the facility of the end customer, i.e. the manufacturer, with the transmission system;

Voltage level	Nominal voltage that determines and nominates the network. Standard voltage levels in the transmission system of Montenegro are 110 kV, 220 kV and 400 kV;
Voltage transformer (VT)	Transformer used with metering devices and/or protection devices in which voltage is in secondary winding, within the determined error margins, proportional to the voltage in the primary winding;
Nominated Electricity Market Operator (NEMO)	An entity that provides a unique day-ahead and intra-day connection of the electricity market in cooperation with TSO;
Balance responsibility party	Balance responsible entity or balance responsibility party of the balance group;
Renewable energy sources	Renewable energy sources are non-fossil energy sources such as: watercourses, biomass, wind, solar, biogas, landfill gas, geothermal energy sources, waves, tides, gas and solid waste from wastewater treatment plants and municipal solid waste;
Maintenance	Activities aimed at preserving the permanent technical correctness of electric power facilities;
Distribution System Operator (DSO)	Energy entity that performs the activity of electricity distribution and is responsible for the operation, maintenance and development of the distribution system in a particular area, its connection with other systems and for ensuring the long-term ability of the system to meet electricity distribution needs in an economically justified manner;
Transmission System Operator (TSO)	Energy entity that performs the activity of electricity transmission and is responsible for the operation, maintenance and development of the transmission system in a particular area and its connection with other systems, as well as to ensure long-term ability of the system to meet electricity transmission requirements in an economically justified manner;
Market operator (MT)	Energy entity responsible for the organization and management of the electricity market, purchase of electricity from privileged producers and resale to suppliers and self-supply customers;
Load	Consumption in EPS that has to be covered by the operation of generation units or by the purchase of electricity from other systems;
Metering data	Data obtained from the metering system and/or processed data or substitute data used for settlement purposes;
Under-frequency relay	Electric metering relay that gets activated when the frequency reaches the value of relay settings;
Total blackout	Situation in which in the entire transmission system there was a power outage caused by a failure of certain system elements, i.e. there was a total voltage-free state;

Consumer	End customer, i.e. legal or natural person who is the owner of a facility (or the person to whom the rights and obligations have been transferred based on the use of a facility) connected to the transmission system that takes over electricity for its needs;
Privileged producer	An energy entity that produces electricity from renewable sources or high-efficiency cogeneration and is entitled to incentive measures in accordance with the Law;
Transmission (of electricity)	Transmission of electricity by an interconnected system of high and very high voltage aimed at delivery to end customers or distributors, which does not include supply;
Transmission system	110 kV plants, 110/x kV transformers and 110 kV lines, as well as facilities, transformers and overhead lines of higher voltage level, up to the connection point of a system user to the transmission system, and facilities, telecommunication and information equipment and other infrastructure necessary for its operation;
Producer	A company, legal or natural person or entrepreneur performing electricity generation activity;
Rehabilitation	Replacement of installations, devices, plants and equipment, by which it is not changed the existing transmission system capacity;
Reconstruction	Performing construction and other works on the existing facility by which is changed replacement of installations, devices, plants and equipment, by which it is changed the existing capacity;
Shipping agent	Entity responsible for the transfer of net positions between different central contracting parties;
Synchronous zone	Area that includes control areas of one or more system operators within ENTSO-E which are synchronously interconnected;
Synchronous time	Synchronous time is the fictive time based on system frequency in a synchronous area, which was once set to astronomical time and whose hour frequency amounts to 60/50 of the system frequency. If synchronous time is ahead or behind compared to the astronomical time (time deviation), the system frequency is on average bigger/smaller than the nominal frequency of 50 Hz.
System test	Tests which include simulated conditions or controlled implementation of irregular, unusual or extreme conditions on the whole system or on one of its parts;
System stability	Capability of EPS to maintain safety and stability during normal or disturbed operation modes;
Droop	Percentage value of system frequency drop that provokes a free action of primary frequency regulator for generator to change the generation from zero to full load;
Current transformer (CT)	Transformer used with metering and/or protection devices in which the current is in secondary winding, within the limits of predefined error, proportional and in phase with the current in primary winding;

Transit	Transmission of electricity, not originating in Montenegro, from one state to the other or return to the state of origin through the territory of Montenegro;
Market Rules	A regulation determined by the market operator in accordance with the Law;
Electricity market participant	Legal or natural person or entrepreneur registered with the Market Operator for the purchase or sale of electricity;
Interconnection Contract (Operational Agreement)	Contract between the TSO of Montenegro and TSOs of neighbouring systems on the joint parallel operation carried out through common, interconnection lines – interconnectors;
Connection Contract	Contract between TSO and system users concluded in accordance with the provisions of the Energy Law (Official Gazette of Montenegro, no. 05/16 and 51/17);
Indoor installations	Installations, lines, plants and equipment that are located before the connection point and are owned by the end customer or manufacturer;
Consumption management	Application of consumption power reduction measures in the EPS to establish balance;
Devices	Equipment used in high voltage plants is part of these plants or is necessary for electricity transmission system operation;
High voltage	Nominal voltage higher than 35 kV;
Exchange program (Operational plan)	A document that represents the operational plan for the generation, exchange and consumption of electricity and power of the holders of balance responsibility, i.e. energy entities and direct consumers;
Frequency set-point	Frequency established by TSO in accordance with ENTSO-E recommendations, as the desired operational system frequency;
Voltage set-point	Voltage level that a generation unit in the transmission system has to reach in the connection point;
Closed distribution system	Energy entity that performs the activity of electricity distribution in a geographically limited area, and consists of plants, lines and transformers from the point of connection to the transmission or distribution system to the point of connection of users of that system, as well as facilities, telecommunication and information equipment and other infrastructure necessary for its operation.

Basic Principles

Fairness and Non-Discrimination

Article 8

TSO shall implement this Code in a fair, non-discriminatory and transparent way.

Information and Data Confidentiality

Article 9

In the implementation of this Code, TSO shall comply with the Rules of Confidentiality of Commercially Sensitive Information prescribed by the law, secondary and internal acts of TSO.

Commercially sensitive data, as well as the data that may have effect on competitiveness are considered confidential data of technical nature as a rule are not considered confidential.

Notwithstanding paragraph 2 herein the transmission system users determine the data related to technical characteristics and requirements for exploitation of their facilities, which are to be handled by TSO as confidential. The data referred to in paragraph 3 of this Article constitute an integral part of the Contract on use of transmission system.

Information and data indicated by the transmission system user as confidential may be disclosed by TSO only upon a written approval of the user. Such a written approval determines for which purpose the information or data may be disclosed.

Data related to the operating capability, state of reservoirs, consumption, generation and exchange of electricity of each individual user shall be dealt with in accordance with regulations governing the manner of providing, submitting and publishing data relevant to the electricity market.

Basic information on the transmission system operation, including the basic information on disturbances and other emergency situations, are not considered confidential.

Data on the transmission system load shall be disclosed by TSO in the form that does not violate the confidentiality of information of the transmission system user.

For the purpose of ensuring technical preconditions for security analysis of electric power system operation, TSO exchanges corresponding data with the neighbouring transmission system operators, relevant data including commercially confidential or sensitive data.

II. GENERAL REQUIREMENTS FOR TRANSMISSION SYSTEM USE

Specific Provisions

Article 10

The shall prescribe the general requirements for transmission system use in the Code.

The general requirements under paragraph 1 of this Article include the basic rights and obligations of TSO and transmission system users, as well as standard contracts concluded by TSO with users, which constitute an integral part of this Code.

Rights and Obligations

TSO Obligations

Article 11

TSO shall ensure electricity transmission for the needs of transmission system users and shall manage transmission system complying with conditions specified by the licence and certificate in an impartial transparent and non-discriminatory way.

Nominal Transmission System Parameters

Article 12

TSO shall carry out the electricity transmission activity at voltage levels 400 kV, 220 kV and 110 kV.

For nominal voltage levels of 400 kV, 220 kV and 110 kV, the permissible voltage range on the transmission system is:

1) 360 - 420 kV for 400 kV voltage level,
2) 198 - 245 kV for 220 kV voltage level,
3) 99 - 123 kV for 110 kV voltage level.

The nominal value of the frequency in the transmission system is 50Hz.

Except transmission system parameters defined in this Article, the minimum quality of supply, which should be fulfilled by TSO, is determined by the rules governing the minimum quality for electricity delivery and supply.

Payment and Indemnification

Article 13

Transmission system user shall pay for transmission system use as stipulated by the Law and the accompanying sublegal acts of the Agency and TSO.

System users shall be entitled to indemnification for the inadequacy of electricity transmission service in the manner and under the conditions stipulated in the Law and Rules governing minimum quality for delivery and supply of electricity.

Obligation to Conclude Contract

Article 14

TSO and user shall enter into contracts on mutual rights and obligations stipulated by the Law and the Code in writing.

TSO and user shall enter into contracts under paragraph 1 of this Article not later than:

1) December 1st of the current year for contracts that shall enter into force on January 1st of the following year, or
2) 15 days following the submission by TSO for other contracts.

TSO shall submit the contracts under paragraph 2 of this Article to the user not later than:

1) November 15th of the current year for contracts that shall enter into force on January 1st of the following year, or

2) 15 days prior to the beginning of contract implementation for other contracts.

Transmission system use without contracts concluded in accordance with the Code is not allowed.

Standard Contracts

Article 15

TSO shall negotiate and conclude standard contract governing:

1) construction of connection infrastructure and connection to the transmission system, with transmission system users,
2) transmission system use, with transmission system users,
3) purchase of ancillary services and balance energy, reserve activation, if required, with service providers,
4) purchase of ancillary services and balance energy for covering transmission system losses, with market bidders,
5) right of access to transmission system, with interested entities, for the use of cross-border transmission capacity.

TSO shall publish standard contract forms on its website.

Standard contracts forms constitute an integral part of the Code.

Contract on the Construction of Connection Infrastructure and Connection to Transmission System

Article 16

The Contract on the construction of connection infrastructure and connection to transmission system shall contain in particular:

1) connection requirements,
2) connection point,
3) the amount of connection power fee,
4) connection method,
5) technical conditions and terms for connection,
6) technical conditions for connection to the telecommunication network,
7) point and method of metering delivered energy,
8) rights and obligations of the system operator and the applicant after connection.

If the connection infrastructure is built by the applicant, the Contract, in addition to the data referred to in paragraph 1 of this Article, shall also contain:

1) commencement and deadline for construction of infrastructure, including a work execution plan,
2) participation of the system operator and method of monitoring the preparation and construction of infrastructure, especially in the part of procurement of equipment and works,
3) deadline and method of performing the final financial calculation,
4) determining the value of the implemented investment and the obligation to purchase infrastructure from the system operator,
5) commencement and deadline for repayment of annuities based on purchase fee in compliance with the restrictions relating to the maximum allowed increase in fixed assets in accordance with the Law.

Contract on Use of Transmission System

Article 17

The Contract on use of transmission system shall contain in particular:

1) method of provision of transmission system use service,
2) period of service use, contracted monthly power and energy values,
3) technical and operational characteristics of facility (communication systems, operation of facility, occupational safety measures),
4) electricity quality,
5) billing metering points,
6) price, calculation method, invoicing and payment of the fee for use of the transmission system,
7) financial guarantees or other forms of security instrument, which the service user is obliged to provide,
8) indemnification to service user in case of service default,
9) cases of service interruption,
10) cases in which services can be cancelled,
11) communication and exchange of information, and
12) period of contract application and entry into force.

Contract on Purchase of Ancillary Services and Balancing Energy

Article 18

The Contract on purchase of ancillary services and balancing energy shall govern in particular the following matters:

1) primary control,
2) secondary control
3) generating units tertiary control,
4) tertiary control through managing power consumption,
5) delivery or takeover of energy based on compensation programs,
6) voltage control,
7) participation in EPS restoration,
8) authorized personnel for cooperation,
9) payment of services,
10) dispute settlement

Contract on Purchase of Electricity for Coverage of Transmission System Losses

Article 19

The Contract on purchase of electricity for coverage of transmission system losses shall contain in particular:

1) method of conducting the procurement of electricity for coverage of transmission system losses,
2) planned volumes of electricity for coverage of transmission system losses as well as delivery conditions,
3) prices, calculation and invoicing method for delivered electricity,
4) financial guarantees,
5) method for submission of exchange programs and a list of responsible persons,
6) cases when delivery may be terminated,
7) conditions under which a receipt of electricity may be cancelled,
8) contract duration.

Contract on Allocation of Right of Access to Cross-Border Capacities

Article 20

The Contract on allocation of right of access to cross-border capacities shall contain in particular:

1) method of granting access to the transmission network,
2) procedure in the event of unforeseen disturbances in the EPS,
3) calculation and invoicing method,
4) payment terms and conditions,
5) dispute settlement

Notwithstanding paragraph 1 of this Article, in the case of capacity allocation through a coordinated allocation procedure, the Contract shall be concluded by confirming the registration form.

Nullity of Standard Contract Provisions

Article 21

Nullity of the provisions of standard contracts established by the Code shall be assessed according to the provisions of the law governing contractual relations.

Other Contracts

Article 22

Before starting to use the system, transmission system user shall enter into a contract governing the matters of his balance responsibility as stipulated by the Market Rules.

III. TRANSMISSION SYSTEM DEVELOPMENT PLANNING

Specific Provisions

Planning Principle

Article 23

Transmission system development includes:

1) construction of new transmission system elements,
2) reinforcement of existing transmission system elements (reconstructions and capacity upgrade),
3) development and modernization of protection system and remote control and monitoring system, as well as information and communication systems necessary for electricity transmission system functioning operation,
4) application of new technological solutions in the field of electricity transmission,
5) improvement of business processes important for electricity transmission.

Transmission system development planning is done based on the assessment of needs and conditions in which the operation of this system will be carried out in the forthcoming period, in order to determine the measures to ensure the normal operation of the electric power system.

Planned construction, reconstruction and upgrading of transmission facilities must ensure the preconditions for the development of generation and distribution capacities, electricity market development and reliable and high quality of supply of electricity for the forecasted level of demand.

Planning-Related Rights and Obligations of TSO

Article 24

TSO shall:

1) determine a transmission system development plan (hereinafter referred to as development plan) and submit it to the Agency for approval no later than 1 June of the year preceding the first year of a regulatory period, aligned with
   - National Energy and Climate Plan, Action Plan for the Development and Use of District Heating and/or Cooling and High-Efficiency Cogeneration (Action Plan), taking into account projects for the construction of electricity generation facilities, and in particular projects for the use of energy from renewable sources,
   - plan for the development of neighbouring transmission systems, taking into account projects of common interest to the Community,
   - the needs of the development of the distribution system and
   - rules for the development and monitoring of the implementation of ten-year electricity transmission system development plans,
2) determine an investment plan according to system user needs in accordance with spatial plan-related documents and submit it to the Agency for approval together with the plan referred to in paragraph 1 item 1) of this Article; and
3) publish the approved plans on its website.

Planning Period

Article 25

Development plan shall be developed for a ten-year period.

Investment plan shall be developed for a period corresponding to the duration of regulatory period set by the Agency.

Implementation and Competencies

Planning Subject

Article 26

TSO is competent for the planning of transmission system development, composed of 110 kV facilities, 110/x kV transformers and 110 kV overhead lines, as well as facilities, transformers and lines on higher voltage level, up to the connection point of system users and facilities, telecommunication and information equipment and other infrastructure necessary for its operation.

Participation in Planning

Article 27

TSO carries out the transmission system planning.

Beside TSO, the existing users connected to the transmission system and potential users of transmission system shall take part in the planning process.

Users have the obligation to inform as soon as possible TSO of any change significant for the transmission system development planning.

TSO shall harmonize relevant components of development plan with transmission system operators in the region and at the level of ENTSO-E as stipulated by the rules of that association.

Development planning is the activity open to the participation of interested public.

Planning Objectives

Article 28

The objective of transmission system development planning is:

1) to make a comprehensive overview of transmission system development and relevant components of electric power system for a given period of time,
2) to establish necessary changes in the transmission system (list, location and basic characteristics of transmission facilities to be reconstructed, upgraded, constructed or decommissioned, including interconnection lines),
3) to ensure conditions for the implementation of forecast and planned electricity transmission, as well as reliable and secure transmission system operation,
4) to create conditions to satisfy needs for electricity exchanges on the market,
5) to ensure economic transmission system use with guaranteed transmission parameters stipulated in the Code and create conditions for further system development with minimum negative environmental impact.

Planning Criteria

Article 29

When planning transmission system development, the following criteria must be fulfilled:

1) transmission system development plan must be based on technical and economic criteria taking in account current load of transmission system elements and generation in power plants, as well as future needs of distribution systems and transmission system users, including the generation facilities that are already connected or will be connected to the transmission system in the respective planning period;
2) dimensions of the transmission system must be in accordance with (n-1) security criterion. Consequences of multiple disturbances that take place in the transmission system are not taken in account in transmission system development planning and must be limited by applying corresponding strategies for defence against major disturbances and strategies for the restoration of supply (defence plan); and
3) transmission system must be planned so as to ensure the maintenance of static and transient stability, as well as the required voltage conditions. In that aim, TSO may request the producer to adjust characteristics and parameters of load-frequency control system of generation units that are relevant from the point of view of stability, and also may request direct consumers to adjust characteristics and parameters of their consumption especially with respect to electricity quality (higher harmonics, flickers) and power factors (cos φ).

The planning process of development activities in the area of transmission system development begins with the collection and analyses of the following basic data:

1) forecast of increases of electricity demand and its geographic distribution,
2) location and consumption of new direct consumers connected to the transmission system,
3) location and capacity of new generation facilities,
4) forecast of electricity exchanges with other neighbouring countries,
5) development programs of other transmission systems of interest in the neighbourhood, and
6) data important for conducting market analyses.

In order to analyse the target year in the future based on market analyses, one or more probable operational scenarios for transmission system are identified, in accordance with the above-mentioned basic data, and based on that, a reference scenario with planned network topology is established in order to identify possible problems in system operation and define needs for reinforcements aimed at resolving the problems identified.

For the purpose of identification of possible problems and transmission system planning, TSO shall

use the following planning criteria:

1) technical criteria and constraints for normal operating conditions,
2) technical criteria and constraints in case of disturbances in the system,
3) allowed short-circuit currents criterion, and
4) criteria for introduction of new and reconstruction of existing transmission system elements.

Technical Criteria and Constraints for Normal Operating Conditions

Article 30

Normal operating conditions mean system operation with forecast demand, corresponding engagement of generation capacities (minimum, maximum and typical regime) and all transmission system elements that are in operation.

For normal operating conditions, the following constraints of transmission system operation are defined:

1) overload of a transmission system element occurs if its load exceeds 80% of thermal limit (thermal current). Thermal currents represent the limiting factor for transmission system elements. This constraint is defined as the temperature of heating of conductor during the flowing of the current, which causes the melting of conducting material or the reduction of distance between the conductor and earth below allowed limits and must be applied separately for both summer and winter season for weather conditions characteristic of Montenegro;
2) allowed voltage range:
   - 360 - 420 kV for 400 kV voltage level,
   - 198 - 245 kV for 220 kV voltage level,
   - 99 - 123 kV for 110 kV voltage level,

   with allowed deviations defined in Appendix 4 to this Code.

Technical planning criteria in normal operating conditions imply that in conditions under paragraph 1 of this Article, the forecast electricity transmission to connection points of users does not lead to the exceeding of constraints under paragraph 2 of this Article and endangering of guaranteed transmission parameters set out herein.

Technical Criteria and Constraints in Case of System Disturbances

Article 31

Operation in case of system disturbances means system operation in any condition in which the system goes from normal operating conditions by unavailability of one transmission system element.

The analysis of N-1 security criterion allows the identification of problems (critical configurations or configurations that are unacceptable from the aspect of security and reliability of system operation), and offers possible solutions for transmission system reinforcement in order to eliminate identified problems.

The security criterion (n-1) is met if the tripping of any transmission system element due to a fault does not:

1) disturb limit values of operational magnitudes determined for the transmission system (operating voltages, voltage range, levels of short-circuit currents) and equipment load (current load) which could jeopardize the security of system operation or provoke damages or reduce life expectancy of equipment;
2) provoke permanent interruptions in supply;
3) provoke cascade outages in the system due to the activation of protection system of element that was not directly affected by the fault, with the risk of further spreading of disturbance;
4) provoke loss of stability in generation units; or
5) create the need to limit or eventually terminate electricity delivery in connection points of

users.

In case of system disturbances, the following constraints are defined:

1) overload of a transmission system element occurs if its load exceeds 100% of thermal limit. Under certain circumstances (in case of construction of major facilities of transmission system which bring to elimination of several identified problems in the system), in case of system disturbances, during the planning process, higher thermal load of elements can be allowed, but only for a short period of time (until the completion of construction of such major facility), in order to avoid excessive dimensioning of the network and to reduce costs;
2) in cases of electric power system disturbances, i.e. major failures of generation and transmission facilities, bigger voltage deviations than those defined for normal operating conditions are allowed.

Technical planning criteria for system operation in cases of disturbances imply that in conditions under paragraph 1 of this Article, the forecast electricity transmission to connection points of users does not lead to violation of criteria under paragraph 3 of this Article, the exceeding of constraints under paragraph 4 of this Article and endangering of guaranteed transmission parameters set out herein.

Criterion of Permissible Short-Circuit Currents

Article 32

Sizing of the equipment in transmission facilities of TSO and facilities of transmission system users must be such so as to comply with calculated values of short-circuit currents. In case of a short circuit, the stable operation of electric power system must not be jeopardized.

Planned maximum values of short-circuit currents must not exceed 95% of breaking capacity of switching equipment which at that moment is installed in existing transmission system facilities, neither of standardized value of breaking capacity of the equipment available on the market for facilities planned for construction.

Calculation of short circuit currents is carried out according to the IEC standard 60909.

Calculations of short circuit currents are carried out for connection status of transmission system, defined in the following way:

1) all generators are connected to the system;
2) all neighbouring systems are connected to the system (interconnection lines are in operation); and
3) all busbar systems are connected.

Exceptionally, the calculation of short-circuit currents may be done with separated busbars, that is:

1) for busbars whose separated operation is anticipated by the instructions for the operation of transmission facilities due to technical characteristics of installed equipment; or
2) in cases when the connection of busbar system generates extreme criteria for the choice of equipment and in the transmission system there are no technical preconditions for such operation.

Short-circuit currents are tested during the preparation of the Transmission System Development Plan for all transmission system elements (including the HV end of user's facility).

Short-circuit currents are calculated during the drafting of the Transmission System Development Plan for a five-year period, taking into consideration the planned development of transmission system as well as the planned development of generation for the same period.

Exceptionally, in the case of the need to plan the commissioning of a generation facility connected to the transmission system that is not covered by the previous plans, a new analysis of short-circuit currents is made.

If TSO evaluates that values of short-circuit currents in the future period (due to the development of electric power system) may jeopardize existing installed equipment in transmission facilities and facilities of transmission system users, TSO undertakes measures in (its) transmission facilities and, together with transmission system users, makes adjustment of measures that need to be applied in users' facilities. These measures primarily include the preparation of the plan for replacement of affected equipment, determination of new connection status of transmission network and users' facilities, and establishment of real-time monitoring of short-circuit currents.

Criteria for Installation of New and Reconstruction of Existing System Elements

Article 33

TSO plans and decides on the installation of new system elements and reconstruction of existing ones for reference based on the adopted:

1) technical criteria (fulfilment of conditions on voltage maintenance and load of network elements),
2) N-1 security criterion,
3) criteria for construction of new system elements,
4) criteria for rehabilitation of existing elements,
5) criteria for technical evaluation of system elements planned for construction/reconstruction,
6) spatial planning criteria,
7) economic criteria, and
8) environmental criteria.

Criteria for Construction of New System Elements and Reconstruction of the Existing Ones

Article 34

If the existing transmission system is unable to ensure the required level of security and quality in exploitation, i.e. when the secure operation of transmission system users is jeopardized, it is necessary to plan the construction of new elements (and/or reconstruction of the existing ones) in the following cases:

1) in case when it has been established that technical criteria and N-1 constraints for system operation under normal or in cases of disturbances are disturbed, it is necessary to plan reinforcements of the transmission system;
2) in cases when the quality of service of the electricity transmission system, determined by the corresponding regulations, is disturbed;
3) in case of the need for encouraging development of electricity market which requires the increase of internal and cross-border transmission capacities;
4) when substation is supplied with power from one node and via one line, for each substation it is necessary to ensure the supply from at least two nodes or exceptionally through two lines from one node, whose level of reliability is satisfactory for a user through the construction of a new line or cable;
5) for each substation equipped with only one power transformer it is necessary to plan the installation of the second transformer, so that the priority is given to the facilities with less developed medium voltage network and higher demand that remain without the supply. The criterion for installation of the second transformer is the following:
   a) for substations with the backup supply from distribution system of more than 50%, installation of the second transformer is planned when the load in the said substation reaches 80% of the value of installed power of the existing transformer;
   b) in case when the peak load in substation reaches 60% of installed power of existing transformers (for normal topology), it is planned either to increase the transformation power or to construct a new facility.

In case any of the conditions under paragraph 1 of this Article is fulfilled, TSO shall establish a list of new elements, the construction (and/or reconstruction) of which can ensure the required level of security and quality in system exploitation.

Rehabilitation of Existing System Elements

Article 35

Reconstruction of transmission system elements includes:

1) rehabilitation of power transformers,
2) rehabilitation of overhead lines,
3) rehabilitation of substations, and
4) rehabilitation of other system elements.

Priority lists for replacement and reconstruction of particular elements are made based on:

1) importance of elements for transmission system operation,
2) reliability of operation of transmission system elements, and
3) expected exploitation age of equipment/transmission system element.

Criteria for Technical Evaluation of Transmission System Elements Planned for Construction/Reconstruction

Article 36

For projects included in the list referred to in Article 34 paragraph 2 herein, TSO shall carry out the following analyses and calculations:

1) steady-state analysis of load flow and voltage profile (normal operating conditions),
2) analysis of load on lines and transformers,
3) analysis of voltage reactive conditions,
4) analysis of active and reactive power generation,
5) calculation of transmission system losses,
6) load flow and security analysis for unavailability of system elements ((N-1) security criterion), and
7) dynamic stability analysis.

On the basis of this analysis, system elements from the list are ranked according to the contribution to the security and reliability of system operation (contribution to reliability, robustness and reduction of losses in the system, transmission capacity increase).

Spatial Planning Criteria

Article 37

For projects included in the list under Article 34 paragraph 2 of this Code, TSO, in accordance with the applicable spatial planning documentation determine the possibilities for the construction of new transmission system elements, define corridors for the construction of overhead lines (cable installation) and possible most suitable locations for the construction of transformer stations.
In the event that the applicable spatial planning documentation does not enable the construction of new transmission system elements, TSO shall initiate a procedure for amending the planning documentation in accordance with the law.

Economic Criterion

Article 38

Besides security criteria related to the transmission system, TSO evaluates options in the development plan from the economic point of view, comparing evaluated costs with the corresponding gain in the sense of reduction of overall system costs (including generation, transmission and distribution costs) borne by the user connected to transmission system.

The basic criterion for the planning of transmission system is minimization of total (investment and exploitation) costs, whilst satisfying security criterion for the operation of EPS and preserving the service quality

TSO makes the choice of new transmission system facilities and extension/reinforcement of the existing ones by comparing alternatives, and the priority is given to:

1) construction/extension of facilities in areas where the system reliability is lower, i.e. the expected value of non-delivered electricity is higher,
2) facilities whose total cost of construction/extension/reinforcement is the lowest,
3) extension/reinforcement of existing facilities instead of constructing new ones, if the centre of consumption has remained unchanged,
4) new facilities in case the centre of consumption has been displaced which directly reduces the distribution system losses,
5) type solutions with the aim of reducing maintenance and exploitation costs (fewer spare parts, maintenance equipment, teams of technicians), and
6) facilities the construction of which is faster thanks to a faster return of investment profits.

If it is possible to carry out an evaluation, it should include congestion costs, trends on electricity market, possibilities for increase of export/import levels with other countries, system losses and possible risk of supply suspension to consumers.

According to the analyses, the elements in the list from Article 34 paragraph 2 herein are ranked according to social and economic criteria defined in CBA Methodology of ENTSO-E, if the Methodology is applicable.

Environmental Criterion

Article 39

When planning the construction of new transmission system elements, the preservation of the environment is considered and efforts are made to minimise the negative impact on space (maximum use of existing transmission line routes, construction of multi-system or "heavy" overhead lines, use of high temperature conductors).

Projects that include the dismantling of parts of overhead lines or facilities whose service life has expired and which are no longer considered necessary for the security of system operation, or limit the possibilities of constructing new transmission system elements must be included in transmission system planning activities.

Input and Basic Data

Article 40

In the process of transmission system development planning, TSO takes into consideration the following data and information:

1) data on demand trends per area,
2) forecasts of electricity balance,

3) development of existing, and projects for new electricity facilities, planned by the users in Montenegro and operators of neighbouring transmission systems, as defined in their development plans,
4) need for rationalization in system planning,
5) any possible disturbance conditions in the system that may occur during the operation as well as needs ensuing from such situations,
6) submitted applications for connection and concluded contracts for the construction of connection infrastructure and connection, and
7) other legal, environmental and safety regulations.

Forecast of Electricity and Power Demand

Article 41

Basic input data necessary for the demand forecast are:

1) actual values of energy demand (MWh) and peak power (MW), for the period of at least five previous years, with special attention paid to values in characteristic regimes of winter and summer peak and off-peak,
2) applications for connection and/or increase of connected power of direct consumers connected to transmission system,
3) forecast of demands of distribution system per geolocations submitted by DSO at the request of TSO.

Forecast of increase of electricity and peak power demand in EPS of Montenegro relevant to transmission system planning must be fully in line with the Strategy of Energy Development of Montenegro.

Data on Energy Sources

Article 42

With regard to energy sources, TSO plans transmission system development based on:

1) data on existing power plants which include the existing parameters specified by the Contract on connection and possible changes due to planned revitalization, extension/downgrading of generation capacities or decommissioning of generation units,
2) data on planned power plants, which are determined in the National Energy and Climate Plan or application for connection, if such an application has been already submitted to TSO, as well as data received from competent institutions, and
3) data on energy sources in other systems of interest in the environment.

Forecast of Electricity Import/Export

Article 43

As the basis of the forecast of potential surpluses/deficiencies of electricity in Montenegro are planned scenarios of development of generation facilities and demand increases for the period for which the transmission system development planning is carried out. Based on this data, TSO carries out the analysis of potential surpluses/deficiencies in EPS of Montenegro according to the National Energy and Climate Plan, i.e. according to another valid act that is in force at the time of drafting the analysis, and evaluates total exchanges with neighbouring systems.

Based on analysis referred to in item 1 herein and evaluation of the situation on the regional electricity market, probable exchanges on interconnection lines are established.

In the process of transmission system development planning, TSO evaluates projects with the

aim of increasing transmission capacity of interconnection lines with electric power systems of neighbouring countries, in order to in an adequate manner meet increasing needs for electricity market operation development.

TSO, together with system operators of neighbouring countries, considers the needs for development of interconnection links.

Critical States due to Disturbances in System Operation

Article 44

In order to confirm that development objectives determined in the previous development plan have been reached, TSO carries out the analysis of disturbances that have occurred in previous years and their consequences.

TSO carries out the collection of data on frequency and duration of faults and other unavailability of transmission system elements. All data on identified critical states and circumstances during disturbances are examined by TSO in order to include, if necessary, new solutions in the development plan.

Transparency of Planning Process

Article 45

At the beginning of preparation of a development plan, TSO shall officially address the competent entities for the submission of data, as follows:

1) To electricity producers:
   - data on planned replacement of equipment, extension/downgrading of generation capacities or decommissioning of existing generation capacities and
   - data on new generation units (installed capacity, primary energy source, geographic location, dynamics of construction);
2) To distribution system operators:
   - forecasts of demand increase in characteristic regimes relevant to the planning per distribution area,
   - geographic distributions of forecasted demand on existing and planned substations in accordance with statistical data from the past and available information on displacement of centres of consumption,
   - data on planned changes of capacities in existing transmission system transformer stations,
   - data on planned construction and connection of new substations, dynamics of their construction and location in accordance with available data on geographic distribution of load and in accordance with spatial planning documentation that is in force, and
   - information on installation (replacement) of equipment in facilities of users that may be relevant to the quality, security and reliability of operation of the entire transmission system;
3) To end customers directly connected to the transmission system:
   - data on planned extension/downgrading of peak demand or decommissioning of parts of facilities for existing users and
   - data on new facilities (peak demand, geographic location of facility, dynamics of construction);
4) To operators of neighbouring transmission systems:
   - data on development plans, relevant to neighbouring transmission systems, are harmonized by TSO at the level of regional working groups;
5) To state bodies:
   - data on planned construction of new generation facilities, lines, transformer stations and planned consumers, dynamics of their construction and location in accordance with available data on geographic distribution of load.

If entities referred to in paragraph 1 of this Article fail to submit the requested data within 30 days from the day of the official address to the competent entities, available data shall be used.

By publishing the transmission system development plan on the official website, after the Agency has approved it, TSO makes all necessary information, relevant to the development of the transmission system of Montenegro, transparent to users and operators of neighbouring systems.

Development Plan

Article 46

Based on input data as defined herein, as well as by applying criteria set out herein, TSO shall specify in the development plan the activities to be taken in the planning period to fulfil planning objectives.

The development plan shall be determined for a ten-year period and is proposed in the year of submitting the request for setting the regulatory allowed revenue.

Content of Development Plan

Article 47

The content of the development plan should meet the requirements and be in the form defined by the Rules for Developing and Monitoring the Implementation of Ten-year Development Plans of Electricity Transmission System. The development plan should include the following:

1) developed methodological approach for the preparation of the development plan,

2) elaborated scenarios in accordance with the National Energy and Climate Plan,

3) forecast of electricity consumption and generation in accordance with projections that reflect the situation in Montenegro,

4) description of characteristics of existing transmission system facilities and their current condition,

5) geographical display of the total available power per point in the system free for connection of new users (ΔGTC),

6) transmission system analysis consisting of:

   a) results of analyses of power flows and load of system elements,

   b) results of analyses of voltage-reactive conditions,

   c) results of analyses of short-circuit currents,

   d) results of analyses of dynamic system security,

   e) results of analyses of electricity losses,

   f) conclusions of analyses of impact of available development plans of neighbouring transmission systems,

   g) results of analyses of transmission power and congestion,

   h) assessment of quality indicators of electricity not supplied,

   i) analysis of the expected impacts of connection of new distribution systems, closed distribution systems, as well as the impact of changes in distribution systems on the

transmission system, especially those impacts resulting from the connection of new generation facilities to the system based on development plans or other planning documents,

7) list of necessary investments that make up the list of investments related to new transmission system elements, list of interventions on the existing infrastructure and list of categories of other necessary investments to which the investments contained in the investment plan belong.

Investment plan

Article 48

TSO's investment plan, based on the system needs, determines the time frame for the implementation of development projects.

The investment plan contains information, analyses and explanations in accordance with the form provided by the Rules for Developing and Monitoring the Implementation of Ten-year Development Plans of Electricity Transmission System.

The investment plan particularly contains:

1) legal framework for the adoption of the investment plan,

2) categories of necessary investments in the planning period,

3) completed form for techno-economic analysis, for each investment individually,

4) completed investing plan form.

A depreciation plan for fixed assets to be built and an infrastructure purchase programme shall be submitted along with the investment plan.

The investment plan consists of:

a) projects as single investments,
b) programs that contain several single investments that do not have to be physically directly related and whose coordinated implementation contributes to the achievement of planning goals.

The investment plan may contain planned funds, intended for the implementation of investments that cannot be foreseen at the time of drafting the plan, in the total amount not exceeding the estimated value of the procurement of 400/220 kV transformer (400 MVA power).

The order of investments in the investment plan is determined by TSO taking into account the priorities. The investment plan must be in line with the development plan.

Update of Development Plan and Investment Plan

Article 49

If needed, TSO shall annually update the development plan and investment plan as follows:

1) it shall include any changes caused by objective reasons or obligations to construct facilities in accordance with ratified international agreements,
2) it shall elaborate the dynamics of implementation of investment projects for the years of the regulatory period, for each year individually.

TSO shall submit the updated development plan to the Agency according to the same procedure as during the adoption of the development plan. In case only the investment plan is updated, the TSO is obliged to submit a draft updated investment plan to the Agency no later than 1 September of the year preceding the first year of the period to which the update relates.

Monitoring the Implementation of Investment Plan

Article 50

TSO shall monitor the implementation of investments through a regular annual implementation report on the realization which is submitted to the Agency in accordance with the Law.

The report referred to in item 1 herein shall contain information and explanation provided for by Rules for Developing and Monitoring the Implementation of Ten-year Development Plans of Electricity Transmission System.

IV. REQUIREMENTS FOR CONNECTION TO THE TRANSMISSION SYSTEM

Connection Requirements

Article 51

Requirements for connection to the transmission system contain minimum technical, constructive, organizational, financial and operational conditions and obligations to be met by the users already connected to the transmission system or persons submitting an application for connection to transmission system.

In addition to these requirements, criteria and applications for connection of new users or change of technical parameters of the existing connector are laid down by other general acts in accordance with the Law:

4) regulation governing the connection of consumers to the electricity transmission system, as adopted by the Government of Montenegro (hereinafter referred to as the Government),
5) regulation governing the connection of direct current high voltage DC cables, as adopted by the Government,
6) regulation governing the connection of electricity generation facilities, as adopted by the Government,
7) regulation determining the amount of charge for connection to transmission system, as determined by TSO and adopted by the Agency.

Appendix 4 and Appendix 5 define the shortest time intervals in which a user must be able to operate when transmission system parameters at the connection point deviate from the nominal values.

Responsible Parties

Article 52

Responsible parties for implementation of requirements for connection to the transmission system are TSO and transmission system users including:

1) electricity producers,
2) owners of interconnection lines subject to exemption from provisions for transmission system access,
3) distribution system operators (DSO), and
4) customers directly connected to the transmission system and operators of closed distribution

system connected to the transmission system.

Application for Connection

Article 53

The connection of a facility to the electricity transmission system shall be initiated by the owner of the facility or the investor by submitting an application for connection to TSO, on the form from Appendix 1.

The connection of a facility to the transmission system shall be performed, in accordance with this Code, based on the Contract on the construction of connection infrastructure and connection concluded by the applicant for connection and the competent TSO.

If necessary, TSO may prepare a preliminary study before submitting the application for connection that will outline the optimal way of connection and that will be used to issue opinions on spatial planning documents.

The preliminary study is based on data obtained in the preparation phase of development plans by state and local government bodies. The moment of initiating the preparation of the study is determined based on the indicated years of commissioning of new generation facilities or consumers, as well as the information on of the initiation of procedures that precede the procedure of addressing TSO.

TSO is obliged to conclude the Contract referred to in paragraph 2 herein and provide priority in connecting energy facilities for generation of energy from renewable sources, if there are no technical restrictions in the transmission system and if the devices and installations of the connected facility meet the requirements determined by law and technical regulations.

TSO has no right to refuse the connection of a new electricity generation facility, as well as a large industrial customer, based on future limitations of available system capacity or based on possible additional costs related to the necessary increase in system capacity.

TSO is obliged to acquaint the applicant referred to in paragraph 2 herein with the method and procedure for concluding the Contract referred to in paragraph 2 herein and its content.

Preliminary Study

Article 54

The preliminary study referred to in Article 53 paragraph 3 herein shall contain in particular:

1) power flow analysis,
2) analysis of system operation in steady state, and
3) N-1 security analysis.

If necessary, the preliminary study referred to in Article 53 paragraph 3 hearing shall also contain the following analyses:

1) short-circuit calculation,
2) electricity quality analysis,
3) analysis of the impact of generation variability on EPS operation (for renewable sources),
4) analysis of the impact on transmission system losses.

Procedure upon Application for Connection

Article 55

Upon submission of the application referred to in Article 53 paragraph 1 herein, TSO shall:

1) prepare a connection possibility analysis,
2) submit a draft Contract on the construction of connection infrastructure and connection,
3) issue a notice on the fulfilment of the applicant's contractual obligations.

Analysis of the Possibility of Connection to the Transmission System

Article 56

TSO is obliged to perform an analysis of the possibility of connection to the transmission system, at the expense of the applicant referred to in Article 53 paragraph 2 herein, which will define the requirements for connection to the transmission system.

The cost of preparing the analysis referred to in paragraph 1 herein, which the applicant is obliged to pay, shall be determined by the transmission system operator in accordance with the methodology governing the determination of the fee for connection to the transmission system.

In order to define the optimal connection requirements that are an integral part of the analysis referred to in paragraph 1 herein, TSO in particular performs the following analyses:

1) power flow analyses:
   - analysis of system operation in steady state,
   - N-1 security analysis,
2) analyses of additional impacts:
   - short-circuit calculation,
   - electricity quality analysis,
   - analysis of the impact of generation variability on EPS operation (for renewable sources),
   - analysis of the impact on transmission system losses,
3) stability analyses:
   - transient stability analyses (near fault, remote fault, APU operation on connection overhead lines),
   - stability analysis of medium duration,
   - analysis of stability to small disturbances.

When preparing the analysis referred to in paragraph 1 herein, TSO may request from the applicant referred to in Article 53 paragraph 2 herein a detailed simulation model of the plant to be used by TSO to conduct all necessary analyses of compliance with the conditions defined in this Code, as well as for to make various system stability studies during the connection of the applicant's facility to the transmission system.

In case of the application referred to in paragraph 4 herein, the applicant referred to in Article 53 paragraph 2 herein is obliged to submit a detailed simulation model of the plant in the appropriate format determined by TSO that must show the real response of the plant during static and dynamic simulations at the connection point.

If the analyses show that the operating conditions of the transmission system at the connection point are unacceptable from the aspect of the prescribed operation of the applicant's plant referred to in Article 53 paragraph 2 herein, TSO shall define appropriate measures to be taken to connect the plant.

If, as a result of the connection of a new or change of an existing facility, extensions, reinforcements or other technical changes in the transmission system are required, all necessary additional measures must be clearly defined and indicated in the analysis referred to in paragraph 1 herein.

TSO shall prepare a draft Contract on the construction of connection infrastructure and connection to transmission system, taking into account conclusions contained in the analysis referred to in paragraph 1 herein.

Conclusion of the Contract on the Construction of Connection Infrastructure and Connection

Article 57

TSO is obliged to submit to the applicant referred to in Article 53 paragraph 2 herein a draft Contract on the construction of connection infrastructure and connection within 90 days from the date of receipt of an accurate application for connection.

The Contract referred to in paragraph 1 herein is made based on the optimal techno-economic solution for connection, in accordance with the Code, while promoting the principle of system adequacy and respecting the restrictions related to the maximum allowed increase in fixed assets in accordance with the Law.

The Contract referred to in paragraph 1 herein is a standard contract, which provides equal treatment of all transmission system users and which is contained in the form of Appendix 3 to this Code.

TSO is obliged to accept the applicant's proposal to entrust eventual disputes regarding the compliance of the draft Contract referred to in paragraph 1 herein with the basis for drafting referred to in paragraph 2 herein to the Agency for resolution in accordance with the rules for resolving disputes through arbitration.

The provisions of the Contract referred to in paragraph 3 herein may change depending on the data on the individual user and the defined connection method.

Notice of Fulfilment of the Applicant's Contractual Obligations

Article 58

TSO is obliged to, within 15 days from the day of receipt of the notice of fulfilment of the applicant’s contractual obligations, assess the fulfilment of the obligations from the Contract on the construction of the connection infrastructure and connection.

In case the conditions referred to in paragraph 1 herein are met, TSO shall notify the applicant that it may conclude a contract on supply with the selected supplier and other contracts in accordance with the Law.

Connection Fee

Article 59

The applicant for connection or increase in connection power is obliged to pay a connection power fee.

The amount of the fee referred to in paragraph 1 herein shall be determined by the transmission system operator based on a unit fee, in accordance with the methodology governing the determination of the fee for connection to the transmission system.

The fee determined in accordance with paragraph 2 herein must be the same for connections of the same power at the same voltage level.

Approval of Project and Other Documentation

Article 60

Within 30 days as of the date of request submission, TSO shall approve investment-technical and other documentation (preliminary design i.e. main design etc.), if it is developed for a facility or part of a facility that has an impact on transmission system operation and necessary for a user to obtain a construction permit.

In case of subsequent change of the documentation referred to in paragraph 1 herein, which may have an impact on electricity transmission system operation, the user is obliged to obtain TSO's approval for such a change.

Temporary Connection and Testing During Trial Operation

Article 61

The following facilities can be temporarily connected to the electricity transmission system:

1) temporary facilities and construction sites built in accordance with the law;
2) facilities for which trial operation and functional testing have been approved in accordance with the law.

The facilities referred to in paragraph 1 herein shall be connected based on the notice of the transmission system operator referred to in Article 58 paragraph 2 herein and a contract on supply.

In addition to the notice referred to in paragraph 2 herein, the applicant for connection to the transmission system, which has concluded the Contract on the construction of connection infrastructure and connection, is obliged to conclude the Contract on use of transmission system, a contract on supply and, at TSO's request, a contract on the purchase of energy and contract on balance responsibility.

The applicant for connection to the transmission system is responsible for providing and covering the costs of a communication link for the period of temporary connection.

During trial operation (if the trial operation is required according to the law governing the construction of facilities), the user is obliged to test the compliance of the operation with the technical parameters of this Code.

TSO shall determine the general and technical requirements for testing through a procedure for testing the compliance of the operation of user facilities, which it publishes on its website.

The assessment of the fulfilment of the user's obligations from the Contract on the construction of the connection infrastructure and connection shall be stated in minutes by a commission appointed by TSO.

All possible irregularities shall be recorded in the minutes and eliminated within the period mutually agreed between the user and TSO.

TSO shall issue the final connection approval based on testing results and conclusions of an expert commission on the compliance of the user's facility with the required technical conditions of connection.

Modifications and Control of Connection Technical Parameters

Article 62

Planned modifications of the components within the user's facility that influence transmission system

operation as well as all other changes in the Contract on the construction of connection infrastructure and connection arising from changes in technical parameters must be specified and agreed in appendix to the Contract on the construction of connection infrastructure and connection.

Complete technical documentation relating to modification referred in paragraph 1 of the Article shall be submitted in time to TSO, prior to modification.

TSO must notify the user in time if the additional testing of the user's facility is required.

General Transmission System Connection Technical Requirements

Connection Point

Article 63

The point of energy delivery between energy entities, i.e. between the energy entity and the end customer, is a metering device, i.e. metering and control station for connecting the facility of the end customer, i.e. energy producer.

The point of delimitation of responsibilities between energy entities, i.e. the energy entity and the end customer, is the point of connection of the facility of energy entities, i.e. the customer to the transmission system.

Connection point of a user to transmission system are determined by TSO in accordance with relevant operating regimes of the transmission system, installed power, mode of connecting facility's operation as well as with interests of the user.

A user may be connected to transmission system at voltage level 400kV, 220kV and 110kV.

Connected Power at Connection Point

Article 64

Connected power is the power required by the user from TSO in the connection procedure and represents permanently allowed power by which the user may withdraw energy from the system or deliver energy into the system following the guaranteed transmission parameters.

The connected power of a transmission system user cannot be less than 10 MVA.

The limitation under paragraph 2 of this Article shall not apply to the connection of line facilities of public road infrastructure, and in exceptional cases also to distribution system facilities.

Interoperability

Article 65

With the aim of electricity delivery or withdrawal, user's facility must be connected to transmission system connection point through system element with the possibility of disconnection (switching equipment).

Where in accordance with connection requirements the user construct a substation that is under his authority, equipment in that facility must be sized and adjusted so that the facility operates in line with current regulations and technological standards, whereby it must be compatible with the existing equipment in the transmission system.

Connection Principles

Article 66

In accordance with transmission system topology and operational requirements, connection of user facility with the transmission system can be performed:

1) by connection to existing or planned transmission line in accordance with the in/out principle or
2) by direct connection to busbars in existing or planned substation (switching station).

TSO, when signing the Contract on the construction of connection infrastructure and connection, is entitled to specify the configuration of a user facility (busbars number, number of transmission and transformer bays) including the associated switching equipment and other elements that are part of the facility.

Associated switching equipment considers the following:

1) circuit breakers, with appropriate technical characteristics, which allow selective disconnection of the lines, transformers and busbar systems in user's plant,
2) disconnectors (line and busbar for lines, busbar for transformers and busbar coupling and earthing blades).

Other facility elements include the following:

1) metering system,
2) protection system,
3) SCADA system,
4) uninterruptible power supply system.

Configuration of the facility that is connected to the transmission system, is specified by TSO according to the data which is submitted by the user and considering typical configuration of the facilities which are connected to the transmission system.

In that sense, TSO is considering the following aspects:

1) proposal of the facility's single line diagram submitted by the user,
2) operational characteristics of the facility,
3) regular operational procedures,
4) possibility of alternating supply of the user's facility from the distribution or other systems, and
5) consumption, i.e. load diagram of the facility during the normal operation for consumer, or production diagram in the case when user is the electric energy producer.

Reactive Power Exchange

Article 67

When active power is taken from the transmission system of TSO, user must maintain in accordance with standards, a power factor of 0.95 (inductive) to 1 at the connection point to transmission system.

The conditions of the exchange of reactive power outside limits laid down in paragraph 1 herein are regulated by the Methodology for setting prices for provision of ancillary and system services

Facility Control

Article 68

The operation of electrical facilities covers all technical and organisational activities that are necessary to keep the facilities functional and safe and provide safe handling with switching equipment.

User connected to the transmission system shall provide own control centre of electric power equipment in the facility.

Control centre from paragraph 2 herein shall act according to instructions received from the competent system control centre of TSO.

Control centre of the transmission system user must be permanently in operation and available to TSO.
Operative personnel of the control centre of transmission system user must be qualified for operating and access to the HV switchgear.

Authorized person of transmission system user responsible for handling with switching equipment must be available to the system control centre of TSO in any moment.

Neutral Point Treatment

Article 69

The neutral point treatment in the transmission system is within the competence of TSO.

TSO shall prescribe a corresponding technical specification for grounding the neutral point on voltage levels owned by TSO transmission system, and thereby those neutral points belonging to the system of user.

On 110 kV and higher voltage level, neutral points of transformers and other devices belonging to the plant of the user must have the possibility for grounding.

The method of grounding neutral point on relevant voltage levels belonging to TSO transmission system in the part of the system belonging to the user must be analysed in detail in each individual case, and it is an integral part of the Contract on the construction of connection infrastructure and connection.

Maintenance

Article 70

Owners of elements of the plant connected to the transmission system shall maintain them in accordance with the existing level of technological development in order to guarantee accurate operation of the plant in line with this Code and the Contract on connection.

Safety-relevant elements of the plant such as circuit breakers, uninterruptible power supply systems and relay devices must be inspected regularly according to the maintenance plan, adopted by the user with approval of TSO.

Connection Realization

Insulation Coordination and Uninterruptible Power Supply

Article 71

Insulation coordination of all circuit breakers, disconnectors, grounding rods, power transformers, voltage and current transformers, surge arresters, insulators, neutral point grounding equipment, condensers, VF dampers and jointing equipment in facilities of TSO and facilities of users, must be in accordance with IEC standards.

Uninterruptible power supply through uninterruptible power supply systems must be ensured for all electric devices of auxiliary consumption such as control, communication, protection, measuring devices and control systems of switching equipment in facilities belonging to TSO and facilities of users.

Protection System

Article 72

System protection concept and settings at the interfaces between TSO and the user is determined by TSO in such a way that risks to neighbouring systems or facilities cannot arise.

Protection systems and circuit breakers must be provided at the connection point.

The user shall be responsible for the reliable protection system in his facilities.
To ensure constant functional capability, the protective devices of TSO and those of the transmission system user should be examined at regular intervals.

Record of the protection inspections and their results must be available to TSO and user.

Significant changes of the protective devices and their settings have to be agreed in time between TSO and the user.

All necessary information for fault clearance must be exchanged between TSO and the user.

Protection concept realized by transmission system user at the connection point must be the same as the TSO concept with regard to triggering times, availability, redundancy etc. When selecting his protection concepts, the user must take into account the following:

1) TSO specifies the permissible back-up protection triggering time at the grid connection point,
2) TSO's backup protection concept cannot guarantee 100% protection of the transmission system user plant, particularly not for the faults on the low voltage side of the transformers (on the user's side),
3) For the purpose of fulfilling the 5-step under-frequency plan which is an integral part of the defence plan, TSO can demand the use of frequency relays at the grid connection point and can stipulate their settings, and
4) Fault clearance times much longer than 150 ms can result only in the event of failure of a protective device or of a circuit breaker.

Real-Time Data Exchange

Article 73

Transmission system user should provide and make available to TSO the following real–time data:

1) information on switching equipment status (circuit breakers, disconnectors, earthing switches and tap changers),
2) measured values of basic parameters (current, voltage, frequency, active power, reactive power),
3) information regarding protection, control and alarm devices, and
4) other data of interest depending on the specificity of transmission system user being connected.

The user shall ensure compatible telecommunication equipment and transmission path to the point of connection to the TSO telecommunication network, in order to transfer the specified data to the TSO control centre.

The manner of data exchange from paragraph 1 herein and their scope are an integral part of the Contract on the construction of connection infrastructure and connection, i.e. the Contract on connection.

Metering Equipment

Article 74

TSO is obliged to install a metering device, i.e. a metering and control station, for the connection of the facility of end customer, i.e. energy producer, to the system as its asset and to maintain it, ensure the accuracy of metering and perform energy metering.

Metering systems installed on the electricity connection points (hereafter metering points) during connection realization must be built and operate in accordance with this Code.

TSO shall determine the location on which the metering system shall be installed, taking care about the need that it is as close as possible to the property boundary between TSO and transmission system user.

V. METERING SYSTEMS

Special Provisions

Article 75

TSO shall determine in this Code the manner of measuring electricity in transmission system, functional requirements and accuracy class of metering devices, based on Article 114 paragraph 2 item 11 of the Law.

Provisions of this Code establish rights and obligations of TSO, market players and transmission system users and define equipment and procedures for the purpose of:

1) metering in electricity delivery/withdrawal points,
2) reading and data collection on executed metering from electricity meters, and
3) processing and distribution of data necessary for the electricity market operation.

Metering data are used for needs of calculating transmission system use, settlement of measured values and for the establishment of the level of transmission system exploitation, scope and quality of ancillary services and imbalance and for implementation of incentive measures of privileged producers.

Objectives

Article 76

Provisions of the Code related to the metering establish conditions and obligations the aim of which is to:

1) ensure necessary metering data and establish the procedure for their exchange between relevant energy entities,
2) define values that need to be measured and requirements related to metering accuracy,
3) define minimum conditions for metering and registration of measured quantities of electricity, used for the settlement of contracts on electricity exchange, transmission system use, calculation of imbalance and ancillary services,
4) establish responsibilities related to acquisition, installation, testing, maintenance and control of metering systems,
5) establish alternative calculation values in case of inaccuracy of metering data.

Implementation

Responsible Parties

Article 77

Parties responsible for metering and exchange of metering data are TSO and users connected to the transmission system.

Ownership of Metering System Element

Article 78

The metering system consists of:

1) instrument transformers,
2) metering device (meter),
3) data logger (metering server),
4) communication devices (leased line modem, serial communication converter, Ethernet switch or routers), and
5) communication link.

TSO is the owner and has the obligation to carry out the installation, maintenance, control(inspection) and testing of all metering devices (meters) for the purpose of registration of active and reactive energy flows which are the integral part of metering systems in points of separation of transmission system with users, as well as on interconnectors, including also appropriate data loggers and communication devices.

Instrument transformers can be property of user connected to the transmission system or owned by TSO.

Communication links may be owned by a user connected to the transmission system or owned by TSO. The transmission system user shall provide compatible telecommunication equipment and the transmission path to the point of connection with the TSO communication link.

Access to Metering Systems

Article 79

User connected to the transmission system shall allow to TSO access to the facility or the part of the facility owned by the user, in order to fulfil obligations determined by the law.

In cases when the metering system is located in the facility or in the part of the facility of user, the party responsible for installation, maintenance and compliance with the requested accuracy class of instrument transformers is the user.

Obligations of TSO Related to Metering Data

Article 80

TSO has the obligation to collect and make available to market operator, DSO and owners of supply and generation licenses, and the metering data including, but not limited to generation dispatch lists, metering at the point of energy delivery, data related to the operation and exploitation of balancing energy and provision of ancillary services, etc., which they need to carry out accounts, settlements etc.

TSO has the obligation to publish, in the corresponding format, metering data laid down by the rulebook adopted by the Government, which governs TSO's obligations in terms of manner of

submission and publishing data relevant to the electricity market.

The procedure of metering on interconnectors is regulated by contracts on interconnection with operators of neighbouring systems.

General Requirements

Article 81

Basic principles for the definition of requirements related to metering systems are the following:

1) each point of separation of transmission system and user connected to the transmission system must be equipped with a corresponding metering system,
2) each metering point on interconnection line as a minimum requirement must have account and control metering device (it is possible to install current transformer with two metering cores with same characteristics),
3) accuracy of metering systems and values measured in every network node are determined in accordance with the type of metering point (account or other metering points),
4) TSO is responsible for installation and maintenance of metering devices in all metering points in the transmission system,
5) transmission system user may have the possibility to install an alternative metering device for its needs,
6) TSO is responsible for installation, maintenance, regular verification and testing of metering transformers if the metering point is located in the part of the system in its ownership,
7) user is responsible for installation, maintenance, regular control and gauging of metering transformers located in the part of the system in his ownership,
8) user and TSO must ensure that the accuracy of metering systems complies with technical requirements on metering accuracy specified by this Code,
9) metering systems must be safe, registered with TSO, approved for use by the competent institution and capable of providing data for electronic transfer to the metering database,
10) data on metered electricity must be kept and made available during dispatching and settlement phases,
11) data on metered electricity are measured in units kWh-kilowatt-hour (active) and kvar-kiloVarhour (reactive),
12) metering data used for contractual settlement, transmission system exploitation, system balancing and ancillary services become valid when TSO verifies their validity,
13) metering data must be kept in the metering database,
14) TSO must define the procedure for registration and prepare the metering register, in order to facilitate the implementation of the Code to users and electricity market players with respect of:
   - new metering systems,
   - change of existing metering systems, and
   - disconnection of metering systems, including provision of information on metering systems.
15) all metering systems must comply with standards contained in the Code, or those which the Code refers to.
16) in case of unavailability of metering systems or determined fault in their operation, TSO shall determine corresponding replacement data, to be used instead of the missing one.

Technical Requirements

General Technical Requirements

Article 82

In each metering point as the minimum requirement must exist one metering system capable of registering active and reactive energy consumption each 15 minutes with the possibility of remote and

local meter reading.

In metering points on interconnection lines, the minimum requirements are the installation of current transformers equipped with two metering cores, one for the connection of accounting metering device (meter) and another for connection of control metering device.

For each connection of users to 400 kV, 220 kV and 110 kV system it is necessary to ensure metering of active and reactive energy for both directions:

1) reception/import (MWh),
2) delivery/export (MWh),
3) reception/import (Mvarh), and
4) delivery/export (Mvarh).

Standards for Metering Devices (Meters)

Article 83

Metering devices for active energy must comply with the following standards:

1) IEC Standard 62053-22 – Static metering systems for active power metering (accuracy class 0.2 S and 0.5 S), or
2) IEC Standard 62053-11 – Electromechanical metering systems for active power metering (accuracy class 0.5, 1 and 2).

Metering devices of reactive energy must comply with the IEC standard 62053-23 (accuracy class 2.0).

Accuracy Class of Instrument Transformers

Article 84

Certificates on testing of voltage transformers (VT) and current transformers (CT) must be, at any moment and under any circumstances, made available to TSO when the metering system is located in user's facility.

Minimum accuracy class of metering systems are presented in the Table 1:

Table 1 – Minimum Accuracy Class of Metering Systems

TYPE	Accuracy Class of Connections	
	Accounting and Control Metering Points	Other metering points
Current transformers	**0.2 S**	**0.5 S/0.5**
Voltage transformers	**0.2**	**0.5**
Active energy meters	**0.2 S**	**0.5 S/0.5**
Reactive energy meters	**2**	**2**

Total Metering Accuracy

Article 85

Total metering accuracy must be in accordance with the Table 2:

Table 2 – Total Metering Accuracy

Current, as percentage of nominal current	Power factor	Limits of metering error	
		Accounting and control metering points	Other metering points
Active energy			
20% to 120%	1	± 0.5%	± 1.6%
5% to 20%	1	± 0.5%	± 1.6%
1% to 5%	1	± 0.7%	± 2.1%
20% to 120%	0.5 ind. to 0.8 cap.	± 1.0%	± 2.5%
Reactive energy			
10% to 120%	0	± 4,0%	± 4,0%
10% to 120%	0,866 ind. to 0,866 cap.	± 5,0%	± 5,0%

Locations of Metering Points

Metering Point and Electricity Delivery/Withdrawal Point

Article 86

Metering point represents the physical place (point) in the system where the devices for the metering of electricity are installed and in which the electricity withdrawn from or delivered to TSO is metered.

Electricity delivery/withdrawal point is located on the border of delimitation of fixed assets of TSO and user.

Delivery/withdrawal point and metering point must be determined by the Contract on the construction of connection infrastructure, i.e. Contract on connection.

TSO defines the location of metering point that is the location in which the metering system will be installed.

Metering point is, by rule, located in the electricity delivery/withdrawal point, unless disabled by specific connection conditions, which is provided by an individual Contract on the construction of connection infrastructure, i.e. Contract on connection.

All defined metering points must comply with the criteria of total accuracy metering laid down by this Code.

Metering points can be located in facilities owned by:

1) TSO,
2) electricity producer,
3) distribution system operator (DSO), or
4) direct consumers.

The user has the obligation to ensure that the metering point is located as close as possible to the delivery/withdrawal point (basic criterion). When this is not possible, or when the compliance with this condition incurs significant costs, delivery/withdrawal point and measuring point do not need to coincide.

When the delivery/withdrawal point and metering point do not coincide (for instance when they are not at the same voltage level, or if they are at the same voltage level but are so distant from each other

that electricity losses cannot be neglected), wherever necessary, TSO shall perform correction of metering data for the value of electricity losses in elements of transmission (user) system should be carried out, from the delivery/withdrawal point to the metering point (reducing to the delivery/withdrawal point). Reduction of metering to the delivery/withdrawal point is performed by multiplying the measured value and correction factor determined by TSO, and is integral part of the account process.

Generating Facilities

Article 87

Metering point for electricity delivered by the generating facility to the transmission system is located, according to the basic criterion, in the part of the system owned by the user in the vicinity of delivery/withdrawal point, i.e. border of delimitation of ownership of fixed assets. The exact location of metering point as well as the distribution of responsibilities on the location shall be determined in the connection process.

TSO is responsible for installation, maintenance, regular verification and testing of the main (accounting) metering device (meter) and corresponding communication devices.

The transmission system user is responsible for the installation, maintenance, verification and testing of the rest of the metering system equipment.

The producer may install its own control alternative metering device that has to be carried out through a special current instrument transformer or through a joint metering transformer equipped with two metering cores dedicated to the connection of accounting and alternative metering device.

Electricity Distribution System

Article 88

Electricity delivered or taken over by TSO to the distribution system is measured in feeder cell (bay) of the low-voltage side of 110/x kV transformer owned by DSO.

IDSO is responsible for the installation, maintenance, regular verification and testing(inspection)of metering systems (not including metering devices) whereas TSO is always responsible for metering devices (meters).

DSO may install his own alternative metering device that has to be carried out through a special current metering transformer or through a joint metering transformer equipped with two metering cores dedicated to the connection of accounting and alternative metering device.

Direct Consumers

Article 89

The metering point of electricity delivered from the transmission system to the direct consumer is located, according to the basic criterion, in the part of the system owned by the user in the vicinity of delivery/withdrawal point or the point of delimitation of ownership of fixed assets. The exact location of metering point as well as the distribution of responsibilities on the location shall be determined in the connection process

TSO is responsible for installation, maintenance, regular certification and testing of the main (accounting) metering device, i.e. meter and corresponding communication devices.

The transmission system user is responsible for the installation, maintenance, certification and testing of the rest of the metering system equipment.

Direct consumer may install his own alternative metering device that has to be carried out through

a special current instrument transformer or through a joint metering transformer equipped with two metering cores dedicated to the connection of accounting and alternative metering device.

Metering Systems

Article 90

Metering system is composed of the elements from Article 78 paragraph 1 herein.

Not including instrument transformers, components of the metering system have to be located in a clean and dry place.

Instrument Transformers

Article 91

Current transformers (CT) and voltage transformers (VT) have to comply with the technical requirements and accuracy class laid down by Article 84 of this Code.

Owner of instrument transformers, part of metering systems in the transmission system, shall submit to TSO for approval their technical characteristics, including the details on overload probability, which must be submitted for their insertion in the metering register. In addition, the owner of instrument transformers is obliged to submit a certificate of type approval and a certificate of verification of meters and testing of accuracy class issued by the competent institution.

Current Transformers (CT)

Article 92

In each metering point there must be two sets of current transformers or one current transformer with two or more secondary windings in accordance with IEC standards 60044-1 and accuracy class in accordance with Article 84 of this Code.

One set of current transformers, that is, one metering core must be used exclusively for the supply of accounting metering device. Current transformers that supply alternative metering devices, where they are installed, may be used also for other purposes, complying with criteria related to total metering accuracy from the Article 85 of this Code.

Voltage Transformers (NT)

Article 93

In every metering point must be two sets of voltage transformers, or one voltage transformer with two or more secondary windings, in accordance with the IEC standard 60044-2 and with accuracy class in accordance with Article 84 of this Code.

The drop of voltage in the secondary winding, which supplies metering devices, must not exceed 0,25% of the nominal voltage. Secondary winding of voltage transformers that supply alternative metering devices, where they are installed, may be used also for other purposes, satisfying the criteria related to the total accuracy metering from Article 85 of this Code.

Total load of each secondary winding of voltage transformer must not exceed its nominal load.

Metering Devices

Article 94

Devices for the metering of active and reactive energy must fulfil all conditions stated in the Article 83 of this Code.

All metering devices must possess stable metering dials of total energy for each metered quantity. Metering dials must contain sufficient number of number places for readings in order to avoid the resetting register to zero during the normal reading period.

All metering devices must be labelled by a unique number (identification number). This data, together with technical characteristics and specifications, must be made available to TSO for their insertion in the metering register.

Data logger

Article 95

Each data logger must have such capacity to receive all metered values that have been sent to it for the period of at least 45 (forty-five) days of 15-minute data.

Metering data are collected on a daily basis.

For each data logger must be ensured a secure and continuous supply with a separate cut-out fuse for each device.

The same condition from the previous paragraph applies if the location of the communication device is distant from the data logger.

Data logger must be installed with an alarm signal in a visible place, which gets activated in case of interruption of supply to the device.

Data Storage

Article 96

Metering systems must be capable to be protected from deletion of data stored in the memory.

Metering data logger must ensure the following:

1) in case of interruption of supply to data logger, the device must protect all data stored by that moment,
2) values of energy and demand at the moment when interruption of supply to data logger occurs as well as their zero values after the elimination of the problem with supply must be indicated, so that the system for metering collection could identify them, and
3) until the reestablishment of the supply to data logger, the time, calendar and all data must be supported for 45 days without external supply.

Communication Link

Article 97

A communication link is a physical and/or logical connection which, through telecommunication equipment and a dedicated transmission path, provides the transfer of metering data from the communication devices of the metering system to the data storage device in the transmission system operational control centre of TSO. The transmission path can be implemented via optical cables, GSM or radio systems.

In order to implement the communication link, transmission system user is obliged to provide compatible telecommunications equipment and transmission path to the connection point in the telecommunication network of TSO.

The communication link for data transfer from the metering device must meet the IEC Standard 62056-21 - Communication with meters.

Access to Metering Devices

Article 98

It is necessary to ensure that each metering device can be controlled locally and remotely from separated ports.

Metering equipment must be installed in such way that readings and reprogramming of metering data from metering systems are possible only through local or remote access with corresponding level of security.

During the reading process, if necessary, the following data reading should be enabled:

1) values of electricity exchanges, pursuant to the Article 82 of the Code, if necessary, and
2) alarm indication.

Local Access

Article 99

Each metering device, it is necessary should have a reading port, in order to allow the connection of the local data terminal, such as a computer, for the following purposes:

1) putting in operation, maintenance and error detection,
2) transfer of metering data in case of error in the operation of communication systems, and
3) adjustment of time when it cannot be carried out remotely or automatically.

Remote Reading

Article 100

Each data logger must be equipped with an internal or external communication equipment that supports the data exchange for local and remote monitoring, in accordance with the IEC standard 62056-21. A communication link must be ensured for the acquisition of metering data through the remote meter reading system, and for the purposes of TSO.

Remote access by TSO for the purpose of metering data reading is carried out at least once a day.

Reading of data from metering devices and programming of parameters must be allowed only through the access at a corresponding level of protection.

Communication between data logger and system for metering collection must include corresponding devices and mechanisms for error tests.

TSO determines technical specifications for the format of transfer of data, protocols, devices, as well as mechanisms for error controls and level of protection.

Metering Systems Certification and Testing

Metering Systems Protection

Article 101

After the installation and putting in operation, all equipment of metering systems that is located at the metering point, except the communication equipment, have to be closed and protected with a seal in accordance with regulations. The seal must be positioned in such way so that the inside part of metering devices cannot be accessed by anyone without breaking the seal.

General Conditions of Testing and Certification

Article 102

TSO is responsible for verification, revision and confirmation of specifications of metering systems, he approves testing and programs for putting in operation the metering equipment, controls the results and monitors the testing and certification of metering devices and instrument transformers. By a method of random sample, TSO carries out periodic revisions of metering systems, in order to confirm their compliance with this Code.

TSO must have unlimited access to metering devices for their control, data verification and system revision.

Transmission system user has the obligation to inform TSO of all changes of parameters of existing metering systems which he intends to carry out. The user cannot make planned changes without prior approval of TSO.

Windings of metering transformers and parts of metering systems must be secured and protected.

Metering systems must be tested and certified in accordance with standards determined by the competent institutions and must fulfil criteria related to overall metering accuracy from the Article 85 of this Code.

Separate blocks of terminals for connection testing, aimed at facilitating the testing and certification, must be ensured for all metering devices.

Testing device must be located as close as possible to metering devices to which it refers.

Metering Devices Control

Article 103

All metering devices must be gauged, tested and certified before the beginning of their commercial use (initial testing and certification), in accordance with specifications and laid down technical characteristics.

Testing and certification may be carried out by competent person or institution.

Results of tests and certificate on testing and certification must be made available to TSO for the purposes of control and insertion in the metering register.

All metering devices must be regularly tested and certified, in specific time intervals and as needed.

All metering devices must be tested for accuracy at the moment of initial putting in operation.

Tests are also carried out in specific time intervals in order to establish whether metering devices operate within determined error limits, as specified in the Article 85 of this Code.

Dates and results of all tests must be submitted to TSO for their insertion in the metering register.

From time to time, as needed, beside these, special tests can be requested.

Timetable of testing and subsequent testing and certification is carried out in accordance with regulations governing metrology issues.

If control of the metering device confirmed it accuracy, it is considered that the device worked properly during the entire period preceding to the control.

Certification and Testing of Instrument Transformers

Article 104

New metering transformers must be certified before they are put in operation (initial control) in accordance with specifications and technical characteristics, determined by the competent authority.

Testing results controls must be made available to TSO for the purpose of their verification and insertion in the metering register.

If the results of the initial testing are satisfactory, the competent institution shall issue to TSO a certificate of certification of the metering instrument.

It is necessary to carry out periodic controls of metering transformers, namely for current and voltage transformers every 12 years, for capacity voltage transformers every 5 years, or earlier if an evident fault occurs.
If control of the instrument transformer confirmed it accuracy, it is considered that the device worked properly during the entire period preceding to the control.

Data Loggers Control

Article 105

New data loggers must be controlled before the beginning of commercial use at any location, in accordance with specifications and technical characteristics laid down by this Code.

Periodic controls are not requested for data loggers, unless an evident fault occurs.

Visit to Location

Article 106

TSO shall for all locations ensure visits to locations on a yearly level with the purpose of reading the metering dial and controlling the metering point.

The difference between advancement of metering dial from the metering device for the period and the total sum of consecutive readings for the same time period, must not exceed the tolerance limit of 0,1 %, otherwise TSO shall write a report on fault and to take measures for its elimination.

Visit to location is also carried out in order to verify whether the metering system or related equipment have been subject to any damage or falsification, especially of the seal, and whether there is a likelihood for it to happen.

Metering Devices Errors

Article 107

In case TSO finds out, or he gets informed of the existence of, or probability for an error on the metering device, he has the obligation to investigate and eliminate the problem, i.e. to order to the party responsible for metering to investigate and eliminate the problem with the metering device within 48 hours after becoming aware of the problem.

If the inspection test or metering system revision, carried out in accordance with the Article 102 paragraph 1 of this Code shows that the error is higher than as specified in the Article 85 of this Code, and TSO does not have the information on the moment when the error occurred, it is considered that the error has occurred in the middle of the period from the moment of the last test or revision, in accordance with the law when it has been asserted that the metering system complies with requirements related to accuracy, and the moment when the error was detected.

In case of detected error, TSO shall ensure for the purpose of account replacement data for the corresponding period in accordance with the Article 115 of this Code.

Requests for Shortcoming Elimination

Article 108

TSO shall inform the user about the noted shortcomings in the metering system owned by the user

within 72 hours.

The user shall eliminate shortcomings in the part of metering system referred to in paragraph 1 of Article herein within five days from the day of receiving notification from the TSO

If it is not possible to eliminate the shortcoming from paragraph 2 herein within the prescribed deadline, replacement data from Article 115 herein shall be used for needs of account, where TSO keeps the right to suspend use of the system until the shortcoming is eliminated.

Metering Database Management

Metering Database

Article 109

Metering database stores data read from metering devices.

The metering database consists of:

1) metering dials and
2) metering data.

TSO is responsible for update, maintenance and administration of database metering register, as well as for its security and confidentiality. Users connected to the transmission system shall inform TSO of any change within their competence that affect metering data.

Metering Register

Article 110

Metering register stores permanent information, technical and administrative data related to the metering system.

The purpose of the metering register is to facilitate:

1) registration of network nodes and metering points,
2) verification of fulfilment of all technical requirements of metering systems, and
3) revision and control of changes of registered information.

The user has the obligation to submit to TSO for each metering transformer in his ownership relevant data and technical characteristics.

Metering Register Information

Article 111

Metering register must contain the minimum of data – information related to:

1) network node and metering place (point),
2) metering system equipment.

Identification Number of Metering Point

Article 112

Every metering point must have its identification number. Identification number determines in a unique way the place (point) of metering and it is composed of 16 characters:

1) first two characters represent the identification of the state and are determined by TSO in coordination with externally connected parties and relevant subjects, such as ENTSO-E;
2) the letter "Z" is for identification of the code as the identification code of the metering point;
3) next 3 characters or capital letters represent the identification number of the network, which TSO allocates to system users as unique identification code;
4) next 12 numbers or capital characters represent the identification code of the metering point and are allocated to each metering point individually, with a unique identification code for each metering point. Some characters may be allocated to determine the type of metering system (ex. generation, distribution operator, direct consumer etc.);
5) the last character is anticipated for control of accuracy of EIC code in accordance with standards of assigning ENTSO-E EIC codes.

Capital letters in identification number can be one of the following: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z and "-".

Metering Data

Article 113

Metering data include all metered, collected and calculated values of metering used for the purposes of calculation. Metering data are kept in the database.

TSO is responsible for the collection of data from the metering point, by using specific protocols of data transmission and he has to confirm them, process them, and insert them in the metering database and make them secure for the purposes of settlement of market transactions and the collection of fees for system use.

The user shall ensure the uninterrupted operation of the telecommunication equipment in its facility and the transmission path to the point of connection to the telecommunication network of TSO.

If, for any reason, the remote data reading (or collection) is not feasible, TSO and the user must ensure the data acquisition by local examination. If neither this is feasible, TSO must recur to other means (ex. SCADA system) for collection of evaluated data.

Metering data include:

1) original, time-dependent values of active and reactive electricity collected from metering systems,
2) values calculated by TSO on the basis of original data,
3) evaluated and changed or replaced data in case of erroneous or lost data, and
4) data and values used for accounting purposes.

Data Confirmation

Article 114

TSO is responsible for verification of data validity, as well as for replacement of data in case of errors or data losses, for whichever reason this has happened.

When collecting updated daily data, the following conditions must be fulfilled:

1) collection process – data acquisition is performed automatically and it is controlled by the TSO on a daily basis,
2) if there is no communication with data logger, the alarm gets activated and the fault identification begins
3) time synchronisation of all devices in the metering system is performed automatically and checked by the TSO at least once a week,
4) if the time on data logger is different from the expected one for more than 10 seconds, but less than 1 (one) minute, the time on data logger is corrected by means of data collection system, and

5) if TSO identifies any of the above mentioned faults, he must inform the user within 24 hours after the fault detection.

If there is a discrepancy between the metering system data and database, the party affected by this discrepancy must, in cooperation with TSO, find the most appropriate way to eliminate quickly the reason for discrepancy and agree measures to be taken to prevent discrepancies to happen in the future.

TSO is responsible for examination and elimination of all errors and malfunctions in the metering system. TSO must inform the user of any fault in metering system data, occurred as the consequence of incidents in the metering system.

Data Replacement

Article 115

In the event of unavailability of accounting metering data or error in accordance with 107 of this Code, it shall be considered data from control metering devices. In case of unavailability of data from metering devices, or failure in accordance with Article 107 of this Code, TSO performs calculation of values of missing data.

In case of unavailability of data from SCADA system, TSO shall determine the calculated value from paragraph 1 herein in the following manner:

$$V_{td}^{p} = \frac{V_{t-d}^{MS}}{V_{t-d}^{SCADA}} V_{t+d}^{SCADA}$$

where is:

- V^{p}_{td} - calculated value of the accounting metering data, for the period of interruption duration *d*, from the moment of occurrence of the error or commencement of unavailability *t*
- V^{MS}_{t-d} - value of the accounting metering data measured on the metering system in the period of interruption duration *d* before the moment of occurrence of mistake or commencement of unavailability *t*
- V^{SCADA}_{t-d} - value of the accounting metering data registered on SCADA system in the interruption duration *d* before the moment of occurrence of the error of commencement of unavailability *t*
- V^{SCADA}_{t+d} - value of the accounting metering data registered on SCADA system in the period of interruption duration *d* before the moment of occurrence of the error or commencement of unavailability *t*

In the event that data from paragraph 2 herein are not available, TSO shall determine the calculated value starting from the assumption that the user took over the electricity equal to the three-day average from the period preceding the occurrence of the error or commencement of unavailability of metering data, reduced to the accounting period, with daily diagram of power corresponding to the average diagram from the same period.

Data Access and Security

Article 116

TSO possesses metering data and for security reasons he is the only one to have direct access to metering data.

The parties who have the right to ask for the metering data are:

1) users connected to the transmission system,

2) market operator,
3) suppliers,
4) holders of balance responsibility, and
5) the Agency.

At the written request by any of the abovementioned parties, TSO approves the access to the metering register data.

These data are made available for the purpose of verification testing, disputes, certification some other reason, in accordance with valid regulations.

Data are made available by electronic way, not later than 7 (seven) days from the date of reception of written request.

All metering data located in metering systems must be protected from the unauthorized local or remote access by electronic way, with a corresponding protection system.

Documentation

Article 117

The metering register must contain the exact list of identified and registered delivery points and metering points, as well as other related components, settings and parameters. Any eventual change of components, settings and parameters may be executed exclusively upon information and coordination with TSO.

Design, technical specifications and connection diagrams of metering systems must be duly documented.

These documents must be made available at any moment to transmission system users, as well as to TSO for the purposes of insertion in metering register.

VI. TRANSMISSION SYSTEM OPERATION

Specific Provisions

Article 118

In order to ensure conditions for a secure and stable transmission system operation, this Code determines:

1) technical and other requirements for a secure transmission system functioning,
2) rules for system balancing and criteria and manner of providing ancillary services,
3) manner of operation in emergency situations,
4) technical requirements for connecting and functioning of transmission system in interconnection,
5) manner of publishing data needed for market functioning and giving data to transmission system operators,
6) manner of giving priority to use of domestic sources of primary energy for electricity generation, in case when such obligation is determined by the energy balance, as well as the manner of giving priority in access and taking over of electricity produced from renewable sources and high-efficiency cogeneration.

Transmission System Operation Planning

Forecasts and Plans

Article 119

Transmission system operation planning implies planning activities carried out before real-time control, namely:

1) preparation of long-term forecast of transmission system operation,
2) preparation of annual plan of transmission system operation,
3) preparation of monthly disconnection plan,
4) preparation of weekly disconnection plan,
5) preparation of daily plan of electric power system operation.

Operation Planning Objectives

Article 120

The aim of transmission system operation planning referred to in Article 119 shall be:

(1) balancing of planned production of generators with forecasted demand at the level of transmission (including losses), whilst ensuring sufficient generation reserve, taking in consideration outages of particular generation units, parts of transmission system as well as parts of system users' systems;
(2) fulfilment of required system security standards and quality in supplying consumers with electricity; and
(3) mutual harmonization and optimization of generation programs and planned disconnections in transmission system, without jeopardizing secure and stable operation of the electric power system, i.e. quality electricity supply to consumers.

Long-Term Forecast of Transmission System Operation

Article 121

Long-term forecast of transmission system operation is prepared for needs of providing inputs for preparation of long-term energy balance in accordance with the Law and preparation of TSO business plans.

TSO shall prepare the long-term forecast of transmission system operation for each regulatory period determined by the Agency, by 01 June of the year preceding the commencement of the period for which the forecast is performed.

Long-term forecast of transmission system operation shall contain:

1) forecast of maximum needed powers in the system,
2) forecast of transmission system losses,
3) forecast of electricity transit and
4) forecast of needs for ancillary services.

Submission of Data for Needs of Long-Term Forecast

Article 122

For needs of preparing the forecast from Article 121 herein, users connected to the transmission system shall submit the planned maximum power of exchange by connection points and total exchanged energy, on monthly level for each year of the forecast period, at latest by 01 May of the year preceding the commencement of the period for which the forecast is performed.

Annual Plan of Electric Power System Operation

Article 123

TSO shall prepare the annual plan of transmission system operation by December 15 in the year that precedes the year for which the plan is prepared.

Annual plan of transmission system operation must be agreed with the annual electric power balance determined by the Government and with the disconnection plan determined on regional level, and it shall mandatory contain the following:

1) planned maximum power demand in the system,
2) planned transmission system losses,
3) planned electricity transit,
4) planned needs for ancillary services,
5) disconnection plan of transmission system elements,
6) estimate of transmission system adequacy,
7) estimate of available cross-border transmission capacities.

Disconnection Planning

Article 124

TSO shall prepare annual, monthly, weekly and daily disconnection plans of elements at 400, 220 and 110 kV voltage levels within the transmission system. Transmission system users shall prepare disconnection plans for elements in parts of the system under their competence and submit them to TSO.

TSO shall prepare final disconnection plans of elements of electric power system in coordination with transmission system users, neighbouring transmission system operators and transmission system operators in South East Europe. In the process of regional coordination of disconnection planning, TSO shall cooperate with the regional centre for coordination of security of operation in all phases of planning.

Disconnection plans shall include all no-load conditions which, in accordance with regulations which define general safety operational measures, are necessary to carry out works on elements of electric power facilities at 400 kV, 220 kV and 110 kV voltage levels, as well as those elements of lower voltage levels that are integral part of these elements (secondary and tertiary transformer, transformer neutral point etc.) and other works that require disconnection of electric power system elements.

In preparation of disconnection plans, TSO has the obligation to harmonize outages in transmission system with operations plans of generation units in order to maintain the conditions or normal, or at least secure operation during the disconnection.

Disconnections due to implementation of approved investment plans of TSO and transmission system users must be included in disconnection plans.

More specific procedures for the preparation of disconnection plans, issuing of approvals for disconnection of electric power system elements that affect the operation of user and implementation of basic measures for security of working sites on elements of electric power system facilities, as well as the type, form and content of documents (requests, approvals, etc.) based on which disconnection is approved, are determined by TSO in cooperation with transmission system users.

Duration of Regular Disconnections

Article 125

For duration of disconnection during the year for maintenance, the following values are adopted:

Maximum duration of disconnection for overhead lines

Description of OHL	Maximum disconnection duration
Single 110 kV OHL, for each 10 km	1 day
Single 220 kV OHL, for each 10 km	1.1 day
Single 400 kV OHL, for each 10 km	1.25 days
Double OHL	Time for single OHL x 1.2
Each crossing of OHL over water courses	1 additional day

Table 3 – Maximum duration of disconnection for other electric power system elements

Description of EPS element	Maximum disconnection duration
Busbar system	1 day
110 / x kV transformer	3 days
220 / x kV transformer	5 days
400 / x kV transformer	6 days
All types of bays	3 days

Regular maintenance works on block-transformers and other elements in the part of the system that belongs to the user whose disconnection is necessary during the overhaul of the respective generation unit must be carried out during the overhaul of that generating unit.

Annual Disconnection Plan

Article 126

Annual disconnection plan shall be prepared by months and days and it is part of the annual plan of transmission system operation.

Base information, which contain data on necessary disconnections of transmission system elements, for the preparation of the annual disconnection plan are as follows::

1) draft plans of revisions, overhauls and inspections of electricity transmission facilities and plants,
2) draft dynamic plans for the implementation of investment projects,
3) draft plans of revisions and overhauls of generation capacities and related switching substations, and
4) harmonized annual disconnection plan of overhead lines and transformers relevant to the normal operation of ENTSO-E interconnection in the region of South-eastern Europe.

The annual disconnection plan for the following year is prepared by 1 December of the current year.

Transmission system users shall submit to TSO requests for the change of date of disconnection of elements of 220 kV and 400 kV voltage levels, anticipated by the annual plan, at latest by the 25th day of the month M-2 for the month M.

Transmission system users shall submit to TSO requests for the change of date of disconnection of elements of 110 kV voltage level, anticipated by the annual plan, at latest by the 20th day of the month M–1 for the month M.

Requests for the change of date of maintenance of generation facilities anticipated by the annual

plan, shall be submitted to TSO at latest by the 20th day of the month M – 2 for the month M.

Monthly Disconnection Plan

Article 127

Monthly disconnection plan is be prepared for each day.

The monthly disconnection plan is prepared based on the annual disconnection plan and changes of the annual plan, which, in case they affect the availability of the system to the user, are harmonized with that user.

Monthly disconnection plan is prepared at latest by the 30th day of the month M – 1 for the month M.

Weekly Disconnection Plan

Article 128

Weekly disconnection plan is prepared for each day and each hour.

The weekly disconnection plan is prepared based on the monthly disconnection plan and changes of the monthly plan, which, in case they affect the availability of the system to the user, are harmonized with that user.

Weekly exclusion plans are prepared at latest by Friday at 12:00, the current week for the following week.

Daily Disconnection Plan

Article 129

Daily disconnection plan is prepared based on the weekly disconnection plan.

Submission and Approval of Disconnection Requests

Article 130

TSO shall stipulate the procedure of submission and approval of disconnection requests, whose integral part is also the form for submission of disconnection request.

The user connected to the transmission system shall update regularly the list of persons authorized for submission of disconnection request.

Transmission system users have the obligation to submit to TSO the disconnection request due to planned works by Wednesday at 15:00 h of the current week for the following week.

TSO shall issue disconnection approval for purposes of planned works to the party that made the request by Friday at 12:00 h of the current week, for disconnections planned for the following week.

Urgent disconnections are the consequence of the need to prevent possible emergency situations that might threaten the security of the personnel in affected facility, or in any way jeopardize the security of operation of transmission system elements or facilities, electric power system of Montenegro and neighbouring electric power systems.

The user shall submit a request for urgent disconnection or transmission system element or facility immediately after identifying the problem that might cause the abovementioned consequences. TSO shall give his response to the request in the shortest possible time.

EPS Operation Security

Security Criterion

Article 131

The aim of electric power system operation planning is to maintain the maximum security of supply and reliability of electric power facilities and plants. In the process of operation planning, it is necessary to take in consideration the compliance with (n-1) security criterion.

The outage is defined as the outage of one or more system elements that cannot be foreseen.

The principle of (n-1) security criterion in operation planning (as well as in the real-time operation) implies the following requirements:

1) in the planning process, TSO must ensure that in all operating conditions a single outage (not including simultaneous tripping of both systems on two-system lines) of any system unit (generation unit, transformers, overhead lines, reactive power compensation units etc.) does not lead to operational constraints in its own and/or in neighbouring control areas (exceeding of current, voltage values etc.) neither to provoke suspension of electricity supply;
2) in case of the outage of some system element, even though such outage did not jeopardize the system operation, TSO must adjust system configuration so that the compliance with (n-1 criterion is restored in the shortest period of time, because the outage of another element at the time of intervention after the first outage may jeopardize the integrity of the entire electric power system;
3) TSO may deviate from (n-1) security criterion in the 110 kV network if it is necessary to prevent disturbances on 110 kV network elements due to parallel operation with elements of the higher voltage network, limiting short-circuit currents or works on maintenance or construction of the system, which must be planned in advance in the conditions of seasonal minimums of consumption and appropriate availability of generation capacities, which reduces the negative impact on system operation and user functioning. TSO is obliged to inform DSO and system users affected in all cases when it deviates from (n-1) security criterion in the 110 kV network;
4) in order to maintain the compliance with (n-1) security criterion during intervention works on system elements, TSO may interrupt commercial transactions and temporarily change the planned operation of plants, respecting the principle of minimum costs and minimum non-compliance with electricity market principles;
5) security (n-1) criterion is maintained in cooperation with neighbouring systems, depending on previous agreements between responsible parties. This includes disconnection planning of elements that have influence on the operation of neighbouring systems, as well as exchange of all necessary information and data necessary for calculations based on (n-1) criterion;
6) in verification of compliance with (n-1) security criterion, TSO has the obligation to take in consideration allowed loads or overloads of system elements, as determined by protection device settings on such elements; and
7) in the planning of measures for compliance with (n-1) security criterion, TSO is guided by technical and economic factors, taking in consideration the probability of examined event, its consequences, costs of its prevention, as well as costs of activation of protection measures for prevention of disturbance spreading in the system.

TSO must carry out calculations of N-1 security in order to evaluate consequences of the outage of his own area of responsibility, according to the N situation. N situation is determined through load flow calculations based on the corresponding set of data obtained during the planning process. TSO must carry out N-1 simulations for all outages from the previously defined list of outages (DACF procedure).

Security Analyses

Article 132

In order to ensure the secure operation of EPS, TSO shall check the fulfilment of (n-1) criterion through the implementation of safety analyses in all phases of planning.

In the process of coordinated security analyses, TSO shall cooperate with the regional coordinator for operation security, in accordance with the rules of operation in the ENTSO-e interconnection.

The list of elements whose outages are simulated in security analyses is determined based on the current methodology applied in ENTSO-e.

Based on the results of security analyses, TSO shall apply preventive measures in order to:

- eliminate or reduce the negative impact of identified critical outages on operation security in its area of responsibility, and
- prevent the occurrence of cascading outages that would lead to the spread of disturbances to the areas of responsibility of neighbouring TSOs.

Where necessary, TSO shall implement joint preventive measures in cooperation with neighbouring TSOs affected by these measures.

Coordination of broader preventive measures, in which several TSOs from the region participate, is carried out in cooperation with the regional coordinator for operation security, in accordance with the rules of operation in the ENTSO-e interconnection.

Daily Plans of Power System Operation

Article 133

Basis for controlling the electricity transmission system in real time represents the daily plan of electric power system operation, which is prepared based on the information submitted by the market operator and transmission system users and previously adopted plans.

The daily plan of electric power system operation is prepared in hour resolution and it shall mandatory contain:

1) list of reported electricity transmission, by users,
2) total available and allocated cross-border transmission capacity, by borders,
3) reserve plan and list of engagement of facilities providing ancillary services,
4) daily disconnection plan.

Calculation and Harmonisation of Cross-Border Transmission Capacities

Article 134

Cross-border transmission capacities are calculated based on the following input data:

1) plan of consumption of active electricity in the electric power system of Montenegro and electric power systems in the region;
2) plan of generation of active electricity in facilities connected to transmission system, or facilities connected to distribution system if the sum of installed capacities of generation units exceeds 5 MW, of cumulatively for facilities connected to distribution system, the sum of installed capacities of which does not exceed 5 MW, for the electric power system of Montenegro and generation plans in electric power systems in the region;
3) plan of procurement and supply of active electricity at the level of the electric power system of Montenegro and in electric power systems in the region; and
4) disconnection plans of transmission system elements in Montenegro and countries in the

region.

All plans from paragraph 1 herein are referred to harmonized representative operational regimes and include data on active and reactive power, voltage levels and network topology, necessary for the formation of convergent mathematical model of the electric power system.

Data for the electric power system of Montenegro necessary for calculation/evaluation of values of cross-border capacities are provided by TSO through above described planning procedure. The way in which data are exchanged with TSOs in the region is defined by TSO through corresponding contracts on calculation of cross-border capacities or through agreements at the regional level.

Calculation of capacity is performed at least on annual, monthly and daily level.

TSO may assign the power for calculation of cross-border transmission capacities to a joint body established at the regional level.

Value of cross-border transmission capacities are harmonized with the corresponding neighbouring TSO in manner and within deadlines determined by the regulations for operation in interconnection.

System Balancing and Ancillary Services

Provision of Ancillary Services

Article 135

Ancillary services are services of transmission system users that allow system operation to TSO within prescribed frameworks.

Provisions of the *Grid Code*, related to the ancillary services, establish technical characteristics and requirements which energy entities – providers of the services must fulfil in order to provide ancillary services necessary for electric power system operation taking into account all planned disconnections, outages upon faults and requirement for preservation of frequency and voltage stability in the system.

Procedures, manner of determining and location of costs for the provision of the ancillary services are determined within the "Methodology for setting prices and conditions for provision of ancillary and services of electricity transmission system balancing" and Rules for the operation of the balancing market.

Types and Purpose of Ancillary Services

Article 136

Ancillary services imply:

1) frequency control and power flow control (primary, secondary and tertiary control),
2) delivery of balancing energy,
3) elimination of transmission system congestions (redispatching and counter-trading),
4) delivery of compensation programs,
5) voltage control, and
6) system restoration management after blackout situations in the EPS.

Frequency Control

Article 137

Frequency control is carried out in accordance with criteria determined by a contract on operation in interconnection.

Frequency control is performed by:

1) automatic engagement of primary control reserve, i.e. reserve for maintaining frequency (FCR), which represents action of turbine speed governors after deviation of frequency from nominal value, due to imbalance in generation and consumption in synchronously connected systems, whereby after a frequency disturbance, the full range of FCR is engaged no later than 30s;
2) automatic engagement of secondary control reserve, i.e. reserve for recovery of frequency (aFRR), which enables realization of the determined program of exchange between the control areas, taking over of frequency control from primary control and accordingly release of activated primary reserve, frequency control on the set-point, and adjustment of synchronous time, whereby after the occurrence of deviations from the established exchange plan, the full range of the aFRR is engaged no later than 15 min;
3) manual engagement of tertiary control reserve, i.e. reserve for recovery of frequency (mFRR) or replacement reserve (RR), which enables release of band of the engaged aFRR, whereby after the occurrence of deviations from the established exchange plan, the full range of the mFRR is engaged no later than 15 minutes, and RR for a period longer than 15 minutes, determined by the contract with the service provider.

Elimination of Congestions

Article 138

The elimination of transmission system congestions is performed:

1) by changing the network configuration,
2) by redispatching, i.e. by a coordinated change in the generation and/or consumption plan, undertaken by one or more TSOs, in order to change the physical flows of electricity to prevent physical congestions in the transmission system, within or between control areas,
3) by counter-trading, i.e. by cross-border exchange of electricity between two TSOs to prevent physical congestions in the transmission system, between two control areas.

For redispatching and counter-trading, TSO shall engage generation and/or consumer units, under the conditions defined by the Contract for the Provision of Ancillary Services, as well as services based on contracts with other TSOs.

Reserve Dimensioning

Article 139

TSO shall perform reserve dimensioning from Article 137 paragraph 2 herein, in accordance with the contact on operation in interconnection, in cooperation with other transmission system operators within ENTSO-E.

The amount of reserves, based on TSO proposal determined in manner from paragraph 1 herein, is determined by the energy balance adopted by the Government.

The total range of the positive reserve is determined so that it is not less than the reference incident in the control area of Montenegro. The reference incident is the failure of the largest generator block in the system.

The total range of the negative reserve is determined so that it is not less than the reference incident in the control area of Montenegro. The reference incident corresponds to one third of the installed capacity of HVDC Monita.

The TSO shall determine the range of the secondary control reserve on an annual basis so as to ensure the control of the deviation of the control area in accordance with the contract on operation in interconnection and control block operation contract.

The range referred to in paragraph 5 herein shall be determined according to the following formula:

$$P_{SR}{}^{G} = k \times \max\left(OLACE_{L1}{}^{G-1} - P_{L1}{}^{G}, OLACE_{L2}{}^{G-1} - P_{L2}{}^{G}\right)$$

where:

PSR G – is the range of secondary control for year G

OLACEL1 G-1 – is the error value of the Open loop ACE control area exceeded in 30% of the time during the previous year (G-1)

OLACEL2 G-1 – is the error value of the Open loop ACE control area exceeded in 5% of the time during the previous year (G-1)

PL1 G – is the error value of the control area for monitoring the quality of control at level 1, prescribed by the control block coordinator in accordance with the contract on operation in the interconnection and control block operation contract

PL2 G – is the error value of the control area for monitoring the quality of control at level 2, prescribed by the control block coordinator in accordance with the contract on operation in the interconnection and control block operation contract

k – is the security coefficient amounting to 1.2

The parameters for the calculation referred to in paragraph 6 herein shall be taken in j resolution 15min or 60min, if 15 min is not available.

Common Reserve

Article 140

In order to optimize operation, the control area Montenegro may form a control block with one or more neighbouring control areas.

Operation of the control block and obligations of members are regulated by a separate agreement.

Control block common reserve dimensioning is performed in accordance with the contract on operation in interconnection and control block operation contract.

The total range of positive and negative reserves is determined so that it is not less than the largest reference incident in the systems of control block members.

The share of the control area of Montenegro in providing the control block reserve is determined proportionally to the share in the sum of reference incidents of individual control block members.

Synchronous Time Adjustment

Article 141

Within frequency control, TSO receives instructions for adjustment of synchronous time from the synchronous zone coordinator, which are communicated as change in frequency set-point value to be maintained in a determined period. TSO shall use these values in order to change operational points of AGC.

Balancing

Article 142

In order to control power of exchange with neighbouring systems, TSO shall perform system balancing by:

1) engaging leased system reserves,
2) purchasing or selling electricity on balancing energy market,
3) purchasing or selling electricity based on contracts with other transmission system operators.

All electricity producers are obliged to submit to TSO, along with generation plans, offers for engagement of remaining generation capacities.

TSO shall decide based on the power plant generation plan and requirements for secure system operation from which generating units it shall provide balancing energy, taking account of minimum cost principle.

If it cannot provide sufficient balancing energy, in order to ensure reliable operation of the transmission system and protection of other users, TSO may require from the user responsible for such deviation curtailment of its total consumption for the amount of inadmissible deviation. TSO may apply this solution only if user responsible for deviation can be unmistakeably identified.

If the user from paragraph 4 herein is not able or refuses to proceed in accordance with of TSO requirements, TSO is entitled to disconnect the user from the system.

If the needed balancing energy cannot be provided differently, TSO is entitled to implement emergency consumption curtailment in accordance with Article 168 of this Code.

System balancing costs shall be charged to transmission system user responsible of deviation, in manner laid down by the Market Rules.

Compensation Programs

Article 144

In order to regulate cumulative of undesired deviations of exchange power with other systems, TSO shall implement compensation programs by purchasing or selling corresponding electricity volumes, i.e. it shall perform financial settlement in accordance with the appropriate methodology harmonised at the level of ENTSO-e.

Voltage Control

Article 144

Voltage control within specified limits is a service intended for secure and quality supply of electricity, which is responsibility of TSO.

The voltage must be kept throughout the whole system within specified limits for following reasons:

1) voltage value compatibility with nominal equipment values,
2) to keep voltage value of users within agreed limits,
3) to guarantee system reliability and to avoid voltage collapse, and
4) to maintain static stability.

TSO and all system users participate in voltage control.

Border parts of neighbouring systems also impact the voltage level, therefore TSO shall perform voltage control in coordination with system operators controlling the other end of interconnection overhead

lines.

Reactive Power Control

Article 145

TSO shall control reactive power flow in the system with the goal of minimal reactive power losses.

Reactive power exchange on interconnection lines must be maintained within limits defined by ENTSO-E recommendations:

1) on 400 kV lines in range ± 100 MVar and
2) on 220 kV lines in range ± 50 MVar.

TSO is responsible for balanced reactive power control to maintain voltage in permissible limits in all system facilities. Therewith, TSO must have at disposal devices for reactive power compensation and units capable of reactive power production in connected plants, which is provided by signing appropriate contracts. These devices must have required technical characteristics in order to ensure compliance with defined voltage ranges and agreed voltage parameters.

Each generating unit, in accordance with technical characteristics, must operate in defined operational range with different power factor according to the requirements determined by provisions from Article 51 paragraph 2 of this Code. Each generating unit is obliged to submit to TSO the generator capability chart including also details of potential limitations in operation.

All direct consumers shall withdraw reactive power/energy with power factor no less than 0.95. Terms for withdrawal of reactive power/energy with power factor less than 0.95 are regulated by the in accordance with the corresponding act of the Agency.

Selection of Measures for Reactive Power Control

Article 146

Selection of reactive power supplier is based on technical criteria, minimum cost principle and providing availability of reactive power in particular parts of the system.

In order to ensure satisfactory voltage profile in the system and to keep sufficient reactive energy reserve, TSO carries out following control actions i.e. issues following instructions to transmission system users:

1) decrease or increase of generating unit reactive power generation (MVAr) at the connection point to transmission system. The instruction is mandatory if it was given in accordance with the generator capability chart,
2) scheduled voltage levels of generating units which must be achieved in the connection point with the transmission system,
3) change of transformer transmission ratio,
4) engagement of plants for reactive power compensation,
5) voltage reduction use,
6) network topology change, and
7) request to distributions and direct consumers to achieve withdrawal of electricity with reactive power factor of 0.95.

Power System Restoration after Blackout

Article 147

No-load (independent) start-up capability of the generating unit is defined as capability of generating unit disconnected from the system to return to the operation and start delivering power without

assistance from the electric power system.

No-load start-up capability ("black start") of generating unit is an ancillary service activated by provider and carried out by order of TSO.

"Black start" capable generating units must be always available and keep up to date procedures for no-load start-up, as well personnel trained to execute these procedures.

According to the needs, TSO signs contract(s) for ancillary services with generating units capable of no-load start-up, i.e. system restoration after black out without voltage assistance from outside.

No-load start-up capability of units providing these services is tested at least once in three years.

Electric Power System Control

Control Principles

Article 148

TSO carries out electric power system control in line with the following principles:

1) preservation of EPS normal operation which means operation points of system parameters are far from predefined limits with sufficient security margin,
2) utilization of all available measures for fast removal of potential disturbances, reduction of their consequences and to bring the power system back in normal operation,
3) ensure reliable in-take /delivery of electricity of predefined quality to transmission system users,
4) optimal utilization of available transmission capacities, and
5) minimum cost principle in EPS operation.

Electric power system control in real time considers realization of planned operational regimes taking account of general principles referred to in paragraph 1 of this Article while all participants of electricity market have the possibility to change their initial plans if necessary.

The most important responsibilities in electric power system control consider system control (frequency stability, voltage stability, implementation of defence measures and power system restoration), supervision of system static and transient stability and control of switching manipulations.

Manipulations of switchgear in the transmission system can be performed in the following ways:

1) remotely from TSO's Dispatching Centre, and
2) by issuing instructions to operators in facilities of the transmission system and users.

Control Activities under Normal Operating Condition

Article 149

Control under normal operating condition includes the execution of the following activities:

1) supervision of power system operation in line with agreed daily plan and prescribed system parameters,
2) provision of services of frequency control and voltage control by instructions for activation of ancillary services,
3) supervision of primary and secondary equipment condition and ancillary facilities in transmission system,
4) performing switching equipment manipulations,
5) selection of control regime, local or remote,
6) registering the quantities of operational parameters, alarm and position signals, protection

signals and noise level,
7) coordination of departments for control and maintenance, and
8) exchange of other data necessary for control.

Supervision of Power System Operation

Article 150

With the aim of passing the decisions permitting the realization of the daily operation plan as well as control of EPS in line with general principles stated in Article 149 TSO has following information at disposal in real time:

1) system frequency,
2) voltage values on bus bars in the transmission network facilities,
3) active and reactive power flows in the transmission system and transmission system user's facilities (important for transmission system operation),
4) area control error
5) indication signals and alarms in transmission and transmission system user's facilities,
6) generation units active and reactive power,
7) status of the switching equipment,
8) positions of tap changers on control power transformers, and
9) alarms and signals validating measured values, protective devices operation, communication status, etc.

Supervision of operational parameters of EPS is carried out using SCADA systems in TSO's Dispatch centre, local systems for control and supervision in TSO's and user's facilities as well as with the help of information received by other means of communication with transmission system facilities, user's facilities and operators of neighbouring systems.

Instructions

Article 151

TSO's Dispatch centre responsible for transmission system control is authorized to issue general instructions to system users permitting control of switching operations in the system.
TSO's Dispatch centre issues dispatching instruction during control under normal operating conditions to:

1) manipulate switching equipment in the transmission system,
2) activate ancillary services,
3) switch on/off and control use of the equipment for reactive power/energy compensation.

Instruction is issued by word of mouth; instruction must be recorded on voice recorder or confirmed in written form, or any other way in line with internal procedures of TSO and with agreement regulating the operation of the facility and concluded between TSO and transmission system user or contracts on the provision of ancillary services.

Operating technicians in transmission system and user's facilities have the responsibility to carry out the instruction issued by TSO's Dispatching Centre.

Exceptionally, in case of instruction issued by TSO's Dispatching Centre that may bring into peril to the persons or compromise the facility, the subordinate personnel in terms of system control (operating technicians in transmission facilities and/or staff in control centres of users) doesn't have the obligation to carry out such an order and shall provide a justification for failing to do it. On the other hand, such personnel is free to propose control actions to the competent TSO's control centre based on available data and information, bearing every responsibility for the accuracy of such data.

Intra-Day Modifications of the Daily Power System Operation Plan

Article 152

In case of request made by market participants, i.e. balance responsible entity for intra-day modification of any part of the plan comprised in daily power system operation plan prepared in line with Article 133 of this Code, TSO verifies whether such modification:

1) jeopardizes preconditions for a normal power system operation,
2) interferes with electricity market activities, and
3) jeopardizes transmission system access for another transmission system user.

If it is proved that such modification request violates one of the criteria stated above, such modification is refused by TSO and TSO shall seek in collaboration with responsible party other means to deal with the problems that calls for the Daily operational plan modifications.

Intra-day modification is performed in accordance with rules prescribing intra-day allocation of cross-border capacities on borders of the control area determined by the TSO together with neighbouring transmission system operators.

In case of significant modifications, i.e. deviation from plans of consumption, production or reduction in transmission capacities availability, which may lead to or have already led to disturbances, TSO may independently modify the Daily power system operation plan by activation of ancillary services.

Execution of Works in Transmission Network

Article 153

Disconnection of components in EPS for works is carried out on the basis of disconnection confirmation issued by TSO upon disconnection requests and in line with daily plan and emergency disconnections.

Procedures governing execution of works in transmission system comprise following activities:

1) information exchange in line with Article 130 herein about any planned or emergency works, i.e. necessary operational manipulations in TSO's or user's facilities which may be important for responsible parties in order to avoid undesired consequences for safe operation of EPS and supply of the users as well;
2) instructions issued by TSO's Dispatch centre for execution of manipulations in line with Article 151 herein,
3) confirmation of executed manipulation by the operating technician on duty in transmission system and user's facilities, and
4) instructions issued by TSO's Dispatch centre or operating technician on duty in transmission system and user's facilities for execution of works on lines, following confirmation of executed manipulations providing secure execution of works.

Notification on Execution of Works in Transmission System

Article 154

To ensure stable operation of EPS and to avoid possible undesired consequences for transmission system operation as well as for user's operation, it is necessary to ensure timely and reliable information exchange about all disconnections (planned or emergency) in the system.

TSO informs system users in case of execution of works or manipulations in TSO's transmission system and which may bring consequences for transmission system user's operation.

User must inform TSO of any planned works or manipulations in the user's facility of part thereof which may compromise secure operation of the power system or operation of other users. In accordance with

notification received from the user TSO notifies other users as well as operators of neighbouring transmission systems in line with ENTSO-E guidelines on joint operation in the interconnection.

Notification under paragraph 3 of this Article should comprise the following data:

1) exact name of the element in EPS, subject to execution of works/manipulation,
2) description of works/manipulation,
3) time for starting and completing the works/manipulations, and
4) warning/notice about possible consequences for secure operation of EPS and safety and quality of user's supply.

Internal Procedures Governing Execution of Works in Transmission Network

Article 155

TSO by its internal act governs the procedures for the execution of works in part of the transmission system under TSO responsibility:

1) giving instructions and modality of their delivery,
2) description of confirmation content about executed manipulation and modality of its delivery,
3) giving permits for the execution of works and its content, and
4) issuing notices on the completion of works and its content.

In case of execution of works or manipulations in part of the transmission system under responsibility of the user, all procedures stated above are predefined in scope of the Contract on the construction of connection infrastructure and connection, i.e. within the Contract on connection.

TSO, as well as any other transmission system user, must have an internal act prescribing security measures necessary to be implemented during the execution of works on electric power facilities. This act additionally defines procedures for work safety which must be enforced in case of execution of works in transmission or user's system.

The coordination of occupational safety measures between users and TSO is defined in the Contract on use of transmission system, i.e. Contract on connection.

Communication and Technical Control System Operation

Article 156

Via its communication system TSO enables continuous communication with the transmission network users, electricity market participants and other transmission system operators in compliance with the provisions of the ENTSO-e Operating Handbook (Policy 6 – Communication Infrastructure).

All communication with operational staff in TSO's Dispatch centre related to operation control are performed over the phone connected to automatic call recorder.

In TSO's Dispatching Centre are archived all sent and received faxes, e-mails, written mail and other means of correspondence.

Obligations of transmission system users in the part of ensuring the transmission of necessary information to TSO's Dispatching Centre are defined in the provisions of Article 73 herein.

TSO's communication systems have a high degree of reliability. TSO's telecommunication network is mostly implemented in a topology with protective connecting leads, so that in case of interruption, the traffic is automatically redirected from the working to one of the alternative transmission routes. If transmission system users want to connect their facility to TSO's telecommunications network with lead protection, they are obliged to provide two independent connecting leads to the connection point.

In case of disturbances of interruption in the operation of the communication system, procedure is envisaged which is agreed within the Contract on use of transmission system, i.e. Contract on connection in the part defining transmission system user's facility operation.

Technical system must be designed and used in a way allowing TSO to carry our all its duties concerning transmission system control.

TSO's Control centres must have access to clear and precisely indicated transmission network parameters. These parameters must be presented in real-time.

TSO have the obligation of storing the transmission system parameters with a view to analyse power system performance, generation unit behaviour and to report on power system performance.

Any generator committed to secondary control must be integrated in a related measuring-control circuit which send real-time signals for the design of regulation control area.

In case of temporary unavailability of TSO's National Dispatching Centre or some other circumstances, the Reserve Dispatching Centre shall take over its functions which shall have at its disposal related documentation and necessary functionalities for supervision and control.

TSO and transmission system users have the obligation to keep their communication and transmission system control equipment in proper operating conditions.

Maintenance works of communication and transmission system control equipment must be planned in the manner to avoid any interference with secure transmission system operation. The planning process of the maintenance works is carried out in collaboration with the system users and neighbouring transmission system operator.

Transmission system users submit to TSO's technical control system any real time information required for the execution of control activities in compliance with this Code.

The transmission system user must have all the documentation relating to the telecommunication and transmission network control equipment installed in its facility. At the request of TSO, transmission system user must make these documents available to TSO.

In case of communication fault on its telecommunication and transmission system control equipment, the transmission system user has the obligation to immediately inform TSO thereof.

Data Acquisition

Article 157

TSO collects data required for the planning and analysis of power system operation over specified time profiles important for the planning of power system operation, as follows:

1) data on exchange along interconnection lines,
2) data on generation of active and reactive energy of all power plants,
3) data on consumption of distribution customers, i.e. data on energy delivered to DSO via transformers 110/X kV,
4) data on consumption of direct consumers,
5) state of the accumulation and inflows in hydro power plants,
6) state of coal reserves and heavy fuel-oil for thermal power plants,
7) data on system element's outages with the reason and recorded time of the outage, duration time of interrupted supply to specific consumption area,
8) data on power plant's outages stating the reason and recorded time of the outage,
9) voltage values in the relevant transmission network facilities,
10) data relevant to the electricity market, and
11) other data necessary for the planning and analysis of power system operation.

Transmission system users are obliged to submit to TSO all the data from item 1 herein referring to their respective facilities in the manner and form specified by TSO.

Operation in Emergency Situations

Obligations in Emergency Situations

Article 158

Procedures and plans for power EPS operation in exceptional conditions relate to system operation in disturbed (emergency) states and they are the basis for creation of technical and organizational preconditions in order to ensure secure operation of Montenegrin power system in disturbed (emergency) conditions and prevent propagation of the incidents and mitigate the consequences with the help of all relevant energy entities.

TSO shall secure operation of the Montenegrin EPS wherewith all the users connected to the transmission system are required to facilitate implementation of measures in the scope of their competence, and that TSO has available.

In addition, TSO must comply with the measures passed by the Government in accordance with the Energy Law.

Obligation of TSO is to define preventive measures and internal operational procedures in disturbed (emergency) states within the documents "Defence plan of the electric power system of Montenegro" and "Plan of restoring the operation of the electric power system of Montenegro after blackout". The mentioned documents comprise planning of the following activities:

1) preventive measures in order to restore normal operation of the EPS from the disturbed operational conditions which may lead to contingencies in local system and propagation of disturbance towards rest of the interconnection;
2) determination of predefined set of measures for system defence and prevention of disturbance propagation enforced by execution of dispatchers' instructions or by automatic response of protection devices in case of critical states in EPS; and
3) system integrity restoration process in order to ensure electricity supply to customers and to return the system in normal operational state.
4) suspension and re-establishment of market activities in disturbed modes.

Operation States of EPS

Article 159

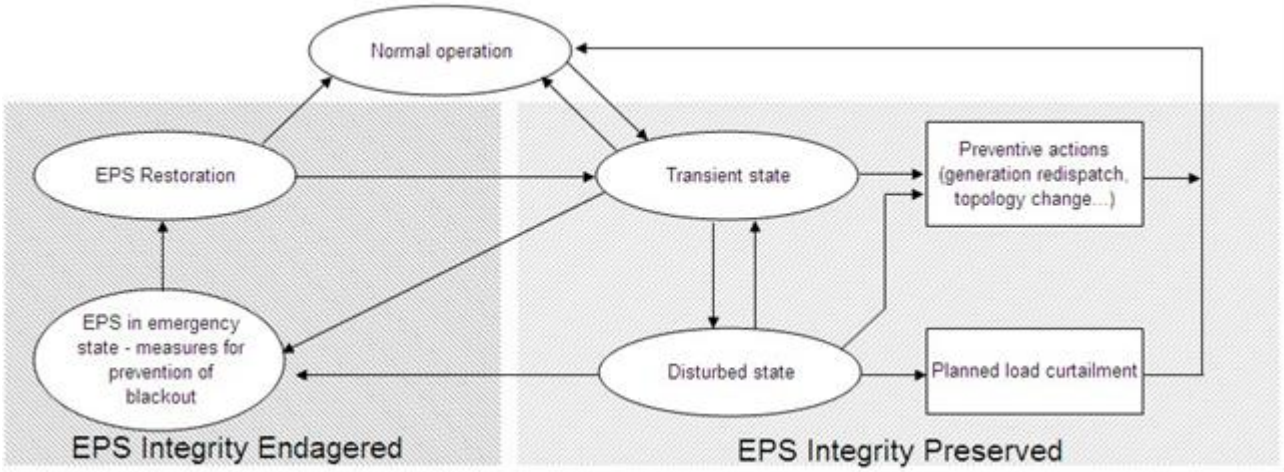
Any deviation from the predefined limits describing system operation shall be considered disturbed operation regime.

Power system can operate in five characteristic operational states:

1) normal state – operating points of physical values which describe system operation are far enough from predefined limits and there is sufficient security margin in system operation, all users are supplied with electricity of defined quality, (n-1) security criterion is satisfied;
2) transient state – disturbed system operation, close to security limits, defence measures are required to restore the system to normal operation and they are defined within defence plan and comprise changes in exchange programs, re-dispatch of generation units, topology changes or transfer of allocated transmission capacity rights on interconnection lines;
3) disturbed state – operating points are at or outside the limits, insecure system operation with system integrity preserved but violated (n-1) security criterion, fast actions as controlled load curtailment are required to restore the system to normal or transient state;
4) emergency state – preventive and remedial measures are not timely undertaken or they are without results, system integrity is jeopardized with possible blackouts and system splitting on number of "islands" in the interconnections, defence measures as automatic load

curtailment, disconnection of lines etc. are required to support operation most of the system and prevent complete blackout; or

5) restoration state – propagation of the disturbance is stopped, system integrity restoration in order to ensure electricity supply of disconnected end customers, transition to normal and transient state.



System operation states and possible transits from one state to another

Security Margins

Article 160

Operational security margin is determined with the goal of early identification of possibility for a transition to disturbed system operation. Security margin violation is defined as violation of necessary security reserve namely significant convergence of parameters describing system operation to the limits especially elements of significant importance for secure operation of the overall interconnection whose outages can violate system integrity. Violation of required security margin implies operation state in which:

1) voltage values are close to minimum/maximum values, or
2) system operational parameters reach values during which N-1 security criterion is not met.

Limits of voltage values are minimum and maximum voltage values in permissible range in normal operation.

Loading margins are:

1) for production units – generation unit nominal power;
2) for lines – maximum allowed loading defined by thermal load, voltage profile and stability limit, for lines which have a protection from overload a short-term allowed overload is also taken into account (overcurrent protection from overload steps settings, signalling and disconnection depending on time settings);
3) for transformers – transformer nominal power, taking into account short-term transformer overload (overcurrent protection steps settings, signalling and disconnection depending on time settings);
4) for bays – continuous permissible loading of bus bar coupler or switching and measuring equipment in the bay;
5) for bus bars – continuous permissible bus bar loading;
6) for reactive power compensation units – unit loading at actual operational voltage.

Defence Measures

Article 161

TSO shall establish preventive and corrective measures as well as automatic actions depending on speed of disturbance propagation (time domain) to coordinate and harmonize of local system protection operation in facilities with SCADA system for operational control within the document "Defence plan of the electric power system of Montenegro".

Measures stated in paragraph 1 of this Article are shown in the figure below:

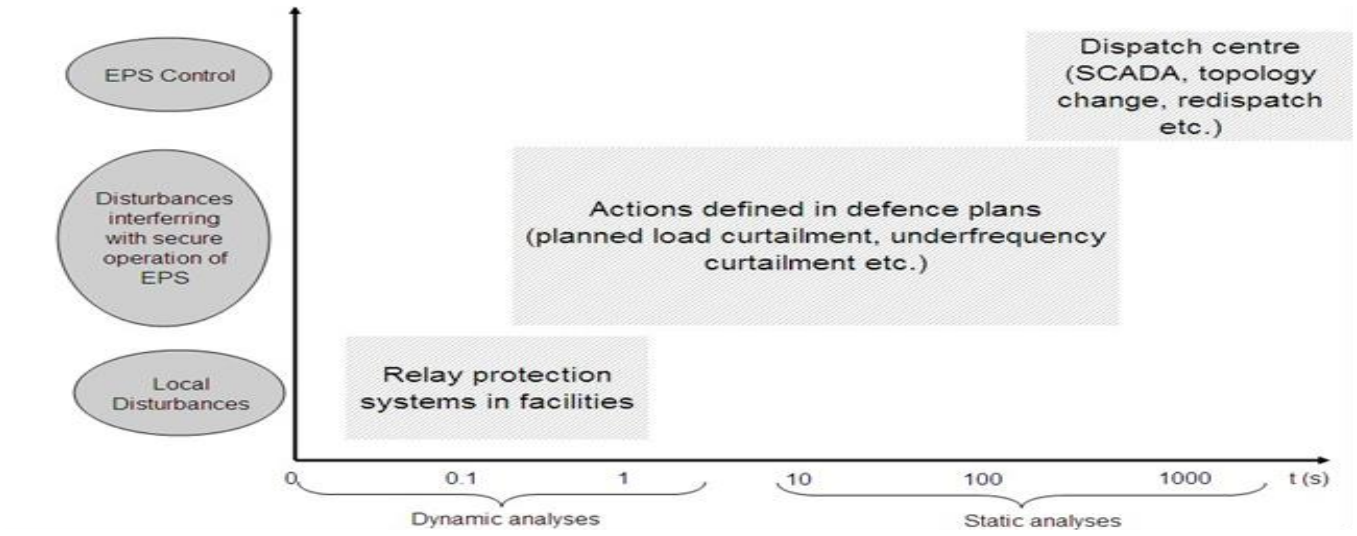


Illustration of defence plan actions in relation to system relay protection and dispatch control centre in time domain

Operation Plans in Case of Disturbances

Article 162

TSO prepares the following internal plans which define procedures in disturbed operation depending on disturbance intensity as well as state and condition of the EPS:

1) protection system operation plan – measures activated automatically to remove disturbance and prevent their propagation, it is updated if needed,
2) preventive action plan and system operation supervision – dispatching actions, generation rescheduling, monitoring of area important for secure operation of Montenegrin EPS, identification of system state and potential threats, preventive measures, it is updated if needed,
3) load curtailment plan – application of corrective measures to reduce disturbance consequences, it is updated annually and
4) system restoration plan after blackout (reconnection of the EPS after partial or complete blackout), it is updated if needed.

Protection System Operation Plan

Article 163

TSO shall prepare an internal protection system operation plan to ensure continuous state control and operation of all power system elements and to react selectively on every fault occurrence or irregular operational regimes.

The protection system plan includes:

1) principles and protection system design,
2) technical criteria which must be implemented in the equipment, and
3) assignment of responsibilities and obligations between TSO and users.

In every moment TSO must have at disposal up to date documentation related to types and protection devices settings which are utilized in its own facilities and in transmission system user's facilities.

TSO coordinates protection system operation taking account of maximal allowed time of fault clearance which will not lead to violation of system transient stability.

In cases when analyses of transient disturbances show shortage in transient stability reserve due to inadequate protection response in any part of the 400, 220 and 110 kV transmission system including user's facilities, TSO utilizes measures in scope of its authority in order to remove identified irregularities in shortest time frame.

Within the protection system operation plan, TSO shall prepare and implement the plan for element protection settings from overloads to ensure efficient protection of overhead lines and belonging high voltage equipment from permanent deformation due to thermal stressing and to timely report about possible violations of security margin and reliable operation of Montenegrin EPS.

The protection system operation plan is revised and updated if needed, after connecting a new system elements and/or user, in accordance with physical limitations of the equipment and planned operational modes of the system.

Plan for Preventive Measures for Disturbance Elimination

Article 164

In the process of long-term development planning, modernization, management, maintenance and operation planning, TSO shall undertake all measures to eliminate disturbances in Montenegrin EPS.

Within the document "Defence plan of the electric power system of Montenegro", TSO shall prepare an internal plan for preventive dispatching actions for disturbance elimination which comprises:

1) criteria for identification of system operation state (identification of violated normal system operation parameters),
2) identification of the events on regional level which may result in emergency system state, and
3) definition of preventive measures for system fast restoration to normal operation state.

Control in Case of Violations of Normal Operation Parameters

Article 165

In case of violated parameters of normal system operation, TSO's Dispatching Centre shall register the occurrence of disturbance and its characteristics based on available information and define adequate control actions to eliminate or limit disturbance propagation.

Control Measures in Case of System Disturbances

Article 166

In case of disturbance in the system, TSO has the obligation to undertake in shortest time frame all necessary control measures which are at disposal to prevent disturbance propagation and to restore the system in normal operation state taking account of time domain of disturbance occurrence. These measures consider removal of long term disturbances and comprise:

1) attempt to reclose transmission system elements that underwent outages,
2) dispatch actions in the system (network topology change),

3) cancelling planned disconnections in transmission system and stopping the works in progress,
4) activation of tertiary reserve,
5) utilization of voltage control measures,
6) change of power plant schedule plan (redispatching or counter-trading),
7) change (cancellation or reduction) of existing electricity exchange (if the results of previous actions are not sufficient to remove disturbance), and
8) other predefined measures which don't include load curtailment.

In execution of stated measures, TSO applies minimum cost principle with minimum violation of electricity market principles (to the extent possible).

Identifying Disturbed Regimes

Article 167

According to ENTSO-e guidelines, TSO has the obligation to prepare defence plan of EPS by which utilization is possible to identify in advance disturbed states in own area and in the region which may lead to further critical violations of operation parameters in the interconnection or its parts, and also determine set of preventive measures to impede propagation of respective identified disturbances in the interconnection thus reducing the consequences.

In accordance with regional approach in recognizing potential dangers possibly present in the interconnection and considering growing number of interconnection lines which increases mutual dependence of the systems, TSO must take into account influence of neighbouring transmission systems on its own.

Taking into account ENTSO-e guidelines, TSO shall perform periodical calculations and define the area of the interconnection affecting the Montenegrin EPS (observability area), which it shall supervise within the SCADA system in terms of secure operation of the Montenegrin EPS and the overall interconnection.

In addition, regional technical and organizational coordination shall be carried out aimed at providing all necessary information by neighbouring transmission system operators for the supervision of the observability area.

Load Curtailment Plans

Article 168

After all available measures are utilized to avoid the implementation of load curtailment plan, TSO can temporarily impose electricity supply constraint to the user or instruct his disconnection from the transmission system in accordance with predefined plan to maintain or restore predefined system security level in following cases:

1) natural catastrophes (force majeure),
2) potential risk to security and stability of EPS,
3) network congestions or the risks for overloading EPS component
4) failures in the transmission system
5) interconnection splitting risk (island operation),
6) violation of static or dynamic stability of the system,
7) violation of system frequency stability,
8) unacceptable local or intersystem oscillations in interconnection ,
9) maintenance, repairs or constructions parts of the system which violate secure operation of the system, or
10) lack (imbalance) of active power in the system.

TSO shall prepare the load curtailment plan that includes the following plans:

1) voltage curtailment plan,

2) emergency electricity delivery curtailment plan, and
3) automatic under-frequency load-shedding plan.

TSO shall decide which type of plan is utilized depending on assessment of operational characteristics of the system and possible consequences for EPS, which may lead to potential propagation of the disturbance.

TSO shall timely notify transmission system users about planned and expected curtailment in electricity delivery except in cases when it is not possible due to required fast response needed for prevention of partial or total EPS blackout.

If a transmission system user refuses to implement load curtailment measures as instructed, TSO has the right to disconnect the whole facility owned by the transmission user or its parts if possible.

Voltage Curtailment Plan

Article 169

Voltage curtailment is operating voltage reduction in the user's systems with goal to limit active power delivery.

Voltage curtailments are implemented in 220/110 kV and 110/X kV facilities. Every facility of the user connected to transmission system must be capable to implement voltage curtailment.

In case of possible occurrence of the overload or voltage collapse which may be remedied by voltage curtailment measures, TSO gives instruction for change of transformer's tap changer position in appropriate parts of the system.

Voltage curtailment plan is revised and updated every year in accordance with planned parameters and characteristics of the consumption (power factor) as well as planned operational regimes of the system.

Emergency Electricity Delivery Curtailment Plan

Article 170

Following unexpected active power deficiency in the electric power system, as a whole or its individual parts it is necessary to utilize emergency load curtailments to avoid possible larger disturbance, operation with unacceptable low voltages or possible reduced frequency. In addition, emergency curtailment can be utilized to reduce overloading of parts of the system including particular nodes in the network.

If it assesses that it is necessary, TSO shall update the emergency electricity delivery curtailment plan until 1st December of the current year for the following year. The plan predefines the amount of load in MW that must be included in the plan of every transmission system user (DSO and direct customers) taking account of the planned level of consumption in characteristic regimes. TSO shall submit the plan to transmission network users, which are required to implement it if instructed.

There are three types of emergency electricity delivery curtailment plan utilization:

1) immediate emergency electricity delivery curtailment,
2) urgent emergency electricity delivery curtailment, and
3) long-term emergency electricity delivery curtailment.

Type and the level of the curtailment to be applied by TSO depend on state and condition of the EPS which require utilization of electricity delivery curtailment.

Immediate Emergency Electricity Delivery Curtailment

Article 171

Immediate emergency electricity delivery curtailment is utilized in case of necessity for very fast response (minute time frame) to prevent further deterioration of the system state blackout of EPS.

Immediate emergency electricity delivery curtailments are implemented by TSO's instruction for immediate disconnection of large facilities with necessary extent of curtailment (220/110 kV and 110 /x kV transformers, 110 kV radial lines, part or total consumption of direct consumers and the like) in respective consumption area and within the necessary extent by applying the Emergency electricity delivery curtailment plan.

Urgent Emergency Electricity Delivery Curtailment

Article 172

Urgent emergency electricity delivery curtailment is utilized following implementation of immediate electricity delivery curtailments, i.e. when immediate danger of larger disturbance has passed in order to achieve greater level of selectivity by more even redistribution of curtailments on larger number of customers and to enable to a certain degree connection of users previously disconnected.

According to system state and by dispatcher judgment, this type of curtailment can be utilized without previous implementation of immediate emergency electricity delivery curtailments. Application of Emergency electricity delivery curtailment plan, including direct consumers and consumption of all distribution areas, power curtailment (in required level) is implemented by disconnection of transformers or appropriate number of feeders in 110/x kV substations. Direct consumers stop their production process or part thereof. User has the obligation to reduce consumption for required amount no later than 15 minutes upon instruction issued by TSO.

End users with discontinued electricity delivery following implementation of this type of curtailment can be without electricity supply in continuous period no longer than two hours. TSO shall prepare the urgent emergency electricity delivery curtailment plan in consultations with transmission system users.

Urgent emergency electricity delivery curtailments shall be carried out by DSOs and certain direct consumers following TSO's instruction.

TSO shall inform users about reasons and duration of urgent emergency electricity delivery curtailment measures.

The end of implementation of urgent emergency electricity delivery curtailment measures and return to normal operating regime is performed upon instruction issued by TSO.

Long-Term Emergency Electricity Delivery Curtailment

Article 173

Long-term emergency electricity delivery curtailments are implemented in situations when the situation in EPS requires load curtailment of customers more than two hours. These curtailments are utilized according a permanent, predefined plan that determines sequence and level of customers consumption required for disconnection. This type of curtailment takes consideration of the selectivity as much as possible and it is implemented by disconnections on 35 kV and 10 kV voltage level.

DSO and direct consumers shall prepare their plans in accordance with the emergency electricity delivery curtailment plan delivered from TSO.

When applying the long-term emergency curtailment plan, disconnections of direct consumers are implemented so as not to cause general danger or greater material damage.

Long-term emergency electricity delivery curtailment is implemented upon enforcing Government

decisions in line with Law.

Automatic Under-Frequency Load-Shedding Plan

Article 174

Frequency stability is related to the ability of a power system to keep steady frequency in permissible operating limits following a severe disturbance resulting in a significant imbalance between production and consumption.

In large interconnected power systems, as Continental ENTSO-E interconnection part of which is Montenegrin EPS, scenarios of system frequency drop are most commonly associated with situations following splitting of systems into islands with imbalances between production and consumption. Stability in this case is a question of whether each island will reach a state of stable operating equilibrium with minimum interruptions in electricity delivery to customers. Likewise, it is of utmost importance to maintain and stabilize frequency value above the limit of 47.5 Hz below which disconnection of generation units takes place, which is achieved by the under-frequency protection system.

TSO shall prepare the under-frequency load shedding plan considering as much as possible requirement for minimum level of disconnected customers form one side, and fulfilment of minimum criterion for solidarity and harmonization of under-frequency protection systems on regional level as recommended in ENTSO-E guidelines.

The amount, i.e. the percentage of load to be shed automatically in stepwise protection is determined according to maximal registered system load in previous year.

It is necessary to periodically harmonize defined plan between TSO, DSO and direct consumers. Harmonization considers submission of data by transmission system users which includes the list of distribution feeders (or parts of the facility of the end user) suggested for disconnection in line with amount in MW predefined by expected level of customer consumption in the year of plan implementation. CGES verifies submitted data, suggested level of consumption to be shed predefined by the plan and delivers to transmission system users agreed plan and they have the obligation for its implementation by installation (and setting) of under-frequency protection systems. If users do not deliver a list of feeders they propose for disconnection, or do not perform installation or setting of under-frequency relays, TSO may install and set under-frequency relays into corresponding 110 kV transformer bays.

When assesses that it is necessary, TSO shall revise and update the under-frequency load shedding plan.

Procurement, installation, maintenance and setting of under-frequency relays is the responsibility of the facility owners in which relays are installed.

Following every action of under-frequency protection system all users whose facilities have relays installed, prepare written reports describing protection actions (number of activated relays, individual or total disconnected power, duration and the like) and submit them to TSO who organizes collective analyses.

Electric Power System Restoration Plan (Black Start)

Article 175

TSO shall issue and update the electric power system (EPS) restoration plan after blackout which represents general strategy for power system restoration immediately after partial or complete system blackout.

The EPS restoration plan after blackout establishes instructions for procedure for all relevant entities included in the restoration process with the aim of restoring the system securely and as soon as possible. Considering that operational capability (readiness) and availability of plants and transmission system capacity are not always the same, TSO has the obligation to continuously supervise power system operation in real time and thereby define relevant procedures for restoration, which take account of actual operating condition of EPS.

The EPS restoration plan shall regulate in particular:

1) restoration priority,
2) availability of capacities utilized in restoration, and
3) guidelines and instructions provided by TSO to transmission system users that must consistently comply with them.

The EPS restoration plan after blackout is revised and updated at least once in 5 years. TSO shall revise and update the plan in case of connection of a new generation unit to EPS, and if there is a change in the system which may influence this plan.

TSO has the obligation to cover in detail the general strategy for EPS restoration as part of the EPS restoration plan after blackout, which includes the following:

1) supply restoration priorities,
2) available capacities for restoration of normal operation state,
3) instructions TSO issues to DSO, electricity producers, as well as to other users, who must comply with them,
4) instructions for independent manipulations on certain generation and transmission facilities handled by the operational personnel following system blackout, and
5) communication with authorized management within TSO, government authorities, media etc.

When defining procedures for EPS restoration, TSO must strictly take account of:

1) process of system restoration, when system frequency must remain controllable and large transient regimes must be avoided. With these goals, it is necessary in this phase to carefully consider possibility to utilize protection for curtailment,
2) validity of settings change, i.e. protection management in periods with significant deviations of system parameters namely with system parameters on low level,
3) voltages, that during system restoration must be in permissible limits,
4) capability of the generation units for production of reactive power used for initial system restoration as well as capability other generation units used in system restoration process must be sufficient to provide voltage control. Utilization of other devices for reactive energy control must be planned also (e.g. devices for reactive power compensation installed direct customers),
5) number of circuit breaker switching, during system restoration process, must be within operational capabilities of every facility in periods of electricity delivery curtailment, and
6) balance of load and minimal allowed production of synchronized generation units must be satisfied in each step of system restoration.

During asynchronous operation of system parts without complete or partial blackout, based on the current situation, TSO shall give instructions to certain users to adjust generation or consumption in order to enable reconnection i.e. resynchronization of the island. TSO shall notify users upon synchronization.

In cases when part of the system with connected generation unit is disconnected from rest of the system and there are no capacities for synchronization with rest of the transmission system, electricity producer, upon TSO's instruction, must disconnect all generation units from the system and keep them on standby (in rotation) for resynchronization after conditions are met and upon instructions issued by TSO.

DSO, power plants and all other affected users must comply with TSO's guidelines during EPS restoration, even in case they oppose respective parts of the EPS restoration after blackout, so far as their utilization doesn't represent a threat to personnel or equipment.

When process of EPS restoration is completed and normal operation is restored, TSO shall notify users that the functioning of EPS is normalized.

TSO shall prepare the EPS restoration plan after blackout that consists of:

1) system restoration plan without external source of voltage, and
2) system restoration plan with external source of voltage.

System Restoration Plan Without External Source of Voltage (Black Start)

Article 176

Complete blackout of Montenegrin EPS implies an outage of all generation capacities in Montenegro, absence of voltage in all facilities and termination of electricity delivery to all customers.

After TSO proclaims complete blackout of EPS, all procedures related to normal operation are suspended and all following actions are executed by instructions issued by TSO in line with the system restoration plan without external source of voltage.

Availability of generation unit with Black start capability is necessary for system restoration after the complete blackout of EPS. Within the system restoration plan after blackout, respective generation units are defined whose location and capability are required for the restoration of Montenegrin EPS.

Procedure which relate to black start capability of generation unit must be periodically reviewed and updated under coordination with providers of this service in order to implement potential changes, determine new conditions or to add new generation units.

General strategy for EPS restoration after blackout, which must be implemented by all users, is covered in the system restoration plan without external source of voltage (black start), which includes following steps:

1) re-energizing of part of the load with the help of power plants with fast start-up capability,
2) step by step synchronization and reconnection of parts of the system, and
3) final and complete restoration of normal operation in the whole EPS, including interconnection lines, when conditions for that are fulfilled in line with the applicable guidelines for mutual operation in the interconnection.

System Restoration Plan with External Source of Voltage

Article 177

Partial blackout of EPS considers separation of one part of the system from rest of the EPS, with power cut, whereby in that system part the consequences are the same as after complete blackout of EPS.

The system restoration plan with external source of voltage includes the following guidelines:

1) operation guideline upon absence of voltage due to fault on the bus bars,
2) guideline for execution of manipulations for every facility in the transmission system, and
3) guideline for EPS restoration with external source of voltage.

In preparation of the EPS restoration plan with external source of voltage, TSO must take account of following priorities:

1) as fast as possible re-energizing of the generation facilities and customers sensitive to long-

term interruptions in electricity supply, and
2) re-energizing of consumption centres according to adopted priority plan.

Training for Power System Restoration Plan Enforcement

Article 178

TSO has the obligation to perform continuous professional training and education of its personnel to be capable and ready to participate adequately in preparation, enforcement, supervision and adapting of the Plan for power system restoration after blackout.

Producers, DSO and all direct consumers have the obligation to ensure adequate training of their own operational personnel to be capable and ready for active and constructive participation in enforcement of measures and activities related to removal of disturbance in EPS operation.

Disturbed State Control

Article 179

Control in disturbed state is performed by TSO and considers implementation of defence measures predefined in plans for EPS operation in emergency conditions permitting to sustain system state or to restore it to normal operation as soon as possible.

All local disturbances (faults) in transmission system are cleared by timely and selective operation of the protection system in line with Article 162 of this Code in order to safeguard the equipment against long-lasting damages and minimize the consequences of the faults or disturbances in the power system and to preserve its stable operation.

The plan of preventive measures for disturbance elimination, which is an integral part of the document "Defence plan of the electric power system of Montenegro", includes all control measures at disposal to TSO's Dispatching Centre for limiting the propagation of the disturbance and enable restoration of normal system operation without implementation of emergency curtailments.

Whenever implemented preventive measures are insufficient or there is still danger for propagation of the disturbance, TSO has the responsibility to temporarily cut-off parts of the system in order to maintain secure system operation and prevent detrimental large scale consequences (total blackout). In disturbed operation regime, instruction received from TSO must be executed without delay.

Activation of Measures from the "Defence Plan of the Electric Power System of Montenegro" and Load Curtailment Plans

Article 180

Whenever there is a case of active power deficiency in EPS, voltage collapse, i.e. lack of reactive power in the system, overloading of transmission network components or any other disturbances threatening to jeopardize the system normal operation, the electricity delivery curtailment may be imposed throughout the system or in parts thereof by applying Plan for electricity delivery curtailment predefined in Article 168 of this Code.

In case of partial or total blackout of EPS, TSO's and system users' competent control centres restore EPS operation in line with the EPS restoration plan after blackout as stipulated by in Article 175 of this Code.

Whenever there is a case of any disturbance interfering with the secure operation of EPS and important for both responsible parties, TSO and the users must exchange information about the new situation.

Determining the Cause and Reporting on Disturbances

Article 181

At TSO's request, user must carry out specific checkout of its equipment connected to the transmission system under responsibility of TSO with the goal to analyse disturbances in the transmission system.

Responsible parties must provide support to each other and exchange information in order to eliminate and analyse the cause for fault occurrence.

Following every significant disturbance in the transmission system relating to disturbance causing electricity supply cut-offs, load curtailment or suspension of contracted electricity exchanges TSO prepares relating report.

Report on significant disturbance includes following data:

1) date, time of occurrence and disturbance duration,
2) location and cause of disturbance,
3) information about suspension of contracted electricity exchanges or load curtailment,
4) total suspended exchange/non-delivered electricity, and
5) recommendation for improving system functioning.

Priority Utilization of Generation Units

Priority Utilization of Renewable Sources

Article 182

In order to provide priority access to the transmission system and the takeover of electricity produced from renewable sources and high efficiency cogeneration, the TSO in case of congestion in the transmission system, as well as for balancing, which require a reduction in production in some parts of the system, shall carry out reduction in the following order of priority:

1) reduction in generation from conventional sources (including the exchange with neighbouring systems),
2) reduction in generation from renewable energy sources with the possibility of storage,
3) reduction in generation from other renewable energy sources.

Priority Utilization of Local Conventional Sources

Article 183

In the event that the obligation of the TSO prescribed in the energy balance is to hire priority generation facilities that use domestic primary energy sources, TSO will in the case referred in Article 182, paragraph 1 herein, apply priority actions that do not require a reduction of domestic production.

Requirements for System Operation in Interconnection

Article 184

The electric power system of Montenegro operates as a control area in interconnection.

The control area Montenegro may associate with other control areas forming a control block, according to relevant regulations.

Requirements for system operation within the interconnection shall be governed according to applicable regulations.

Transmission System Operation Reporting

Operation Log

Article 185

TSO's Dispatching Centre shall keep a chronological operation log that includes all relevant data relating to transmission system control, particularly:

1) issued and received instructions,
2) outages and faults of transmission system components,
3) executed manipulations in the transmission system,
4) relevant events for operation of generation facilities,
5) relevant events for secure transmission system operation,
6) enforcement of suspended electricity delivery,
7) issues with control equipment,
8) protection availability within transmission system,
9) operation documents,
10) received dispatch notes, and
11) other relevant data for power system planning and analysis.

Periodic Operation Reporting

Article 186

Based on the operation log, data in the metering system, SCADA system and data delivered by users, TSO shall prepare periodic reports on transmission system operation that include data on:

1) availability of transmission system within guaranteed transmission parameters on connection points,
2) electricity generation,
3) electricity consumption,
4) electricity exchange,
5) transmission system losses,
6) activated ancillary services,
7) events in system operation,
8) data on the allocation of cross-border capacities, and
9) other relevant data for transmission system operation.

Data referred to in paragraph 1 item 1 herein are determined as follows:

1) each registered voltage deviation in connection point from guaranteed parameters shall be registered as inadequate transmission service for an hour in which it is registered.
2) average annual availability of the system for each reporting period shall be calculated as the number of hours of interruption in transmission service to the connection point in the last 8760 hours divided by 8760.

Data Publishing

Article 187

TSO is obliged to publish data relevant to the operation of the electricity market.

Users are required to make TSO available for publication all information relevant to the operation of the electricity market.

The data referred to in paragraphs 1 and 2 herein and the manner of their submission and publication shall be prescribed by a regulation adopted by the competent authority in accordance with regulations

governing the procedure for ensuring, submitting and publishing data relevant the electricity market.

VII. TRANSMISSION SYSTEM ACCESS

Access and Use of Transmission System

Article 188

Transmission system access implies third party access (transmission system user) to transmission system for the purpose of electricity transmission for production placement, i.e. meeting the consumption needs in Montenegro or electricity transit across the territory of Montenegro.

Provisions of this Code, related to transmission system access, determine general conditions and activity procedures of TSO and coordination of TSO and Market operator as responsible supervisor for organization and electricity market management with the goal to ensure preconditions for concurrent position of market players as well as their rights for non-discriminatory access to transmission system.

Transmission System Use Requirements

Article 189

TSO controls access to the transmission system.

A user can acquire the right of access to the transmission system, as:

1) producer connected to the transmission system, provided that it has concluded contract on use with TSO,
2) supplier of consumers connected to the transmission system, provided that it has concluded the Contract on use of transmission system with TSO,
3) customer self-supplier connected to the transmission system, provided that it has concluded the Contract on use of transmission system with TSO,
4) DSO as equivalent consumer, for the distribution purposes, provided that it has concluded the Contract on use of transmission system with TSO,
5) electricity market participant,
6) power exchange,
7) closed distribution system.

Access to the transmission system may be, under the terms of paragraph 2 of this Article achieved at all border points of the transmission system, while transmission can be achieved in a way that:

1) purchase point and delivery point are within the control area of TSO,
2) purchase point is within the control area of TSO, while delivery point is outside its control area,
3) purchase point is outside the control area of TSO, while delivery point is within its control area, or
4) purchase point and delivery point are in different (or the same) control areas, while outside the control area of TSO (electricity transit).

Contract on Use of Transmission System

Article 190

On the grounds of the Contract on use of transmission system, a transmission system user acquires guaranteed transmission system access to carry out electricity transmission in line with agreed program, time frame and transmission 0direction.

The Contract on use must be concluded before starting the use of the system, in terms and manner

prescribed in articles 14 and 22 of this Code.

The Contract on use is a standard contract that provides equal treatment for all transmission system users and whose general part is prescribed by this Code (Article 17, Article 192 and Appendix 3 to this Code).

Contract elements that are directly related to the user and which are adapted to each individual user are:

1) user data,
2) connection points and metering points for the billing of electricity taken in and delivered (period, power, energy, diagram...),
3) data on the manner of use (period of use, power, energy, diagram...),
4) manner of billing and invoicing,
5) financial guarantees or other forms of securing receivables,
6) cases of service interruption.

Balance Responsibility

Article 191

Before access to the system in accordance with the requirements of Article 189 herein, a user is required to enter into a contract on balance responsibility in accordance with the Market Rules.

The holder of balance responsibility is the owner of a facility connected to the transmission system unless it has already joined the balance group in accordance with the Law and Market Rules.

Use of Transmission Capacities within TSO's Control Area

Procedure of Transmission Capacity Use

Article 192

The procedure of transmission capacity within TSO's control area is determined by means of the standard Contract on use of transmission system referred to in Article 15 paragraph 1 item 2 herein, which contains:

1) electricity transmission parameters, guaranteed in accordance with this Code,
2) connection points and appropriate billing metering points relevant to the metering of electricity transmitted,
3) procedure for registration of electricity transmission, entities and persons authorized for registration,
4) contracted connection capacity and maximum envisaged transmission capacity,
5) the procedure for determining billing values,
6) commercial terms of electricity transmission service, and
7) conditions for temporary or permanent interruption of transmission service.

The Contract on use of transmission system within a control area is concluded, as a rule, once a year.

The method of using the transmission system for the needs of other TSOs from the interconnection shall be governed by a separate multilateral contract in accordance with the law governing the issue of access to the transmission system for cross-border exchanges of electricity.

Transmission Service Realization Phases

Article 193

Electricity transmission service within TSO's control area is realized in the following phases:

1) transmission registration (delivery of schedule),
2) verification of technical feasibility and approval,
3) transaction realization,
4) reporting and billing.

Transmission Registration (Delivery and Certification of Schedules)

Article 194

Transmission system users referred to in Article 4 of this Code are obliged to register transmission with TSO, i.e. to deliver schedules in the manner prescribed by the Market Rules, in the format determined by TSO based on ENTSO-e recommendations.

The users referred to in paragraph 1 herein that conclude the Contract on use with TSO may appoint an entity in the Contract that will be authorized to submit schedules, wherewith they cannot transfer the responsibilities arising from this activity.

Transmission system users that submitted the schedule are allowed to change it according to the procedure established by the Market Rules.

In case of accidental situation in EPS, TSO has the right to suspend some or all reported transactions in order to preserve the stability of EPS.

Verification of Technical Feasibility of Transmission (Exchange Programs)

Article 195

TSO shall verify the technical feasibility of exchange program in relation to secure and stable system operation with the aim of identifying possible technical limitations.

TSO shall verify the technical feasibility of exchange program referred to in paragraph 1 herein in cooperation with other operators in the interconnection pursuant to the regulation of the Government, adopted in accordance with the Law on Cross-Border Exchange of Electricity and Natural Gas.

TSO is entitled to prohibit transactions that are found to threaten safe and stable operation of the system within the verification referred to in paragraph 1 herein.

TSO shall prepare a realized exchange program in accordance with the Market Rules**.**

Transmission Realization

Article 196

Real time monitoring of implementation of the Contract on use of transmission system is performed in TSO's Dispatching Centre.

TSO shall provide the realization of reported transactions through permanent monitoring of system status, corrective actions and engagement of ancillary services.

If by engagement of ancillary services, it is not possible to properly adjust voltage, frequency or power exchange, eliminate congestion in the system through redispatching or counter-trading, TSO may cancel the reported transaction and apply measures provided for system operation in extraordinary/emergency circumstances.

Reporting and Billing

Article 197

TSO shall carry out reporting on the implementation of reported transactions based on data from metering systems at points of delimitation between the transmission system and users, neighbouring systems and other relevant points.

TSO shall submit billing data to transmission system users, providers of ancillary services and suppliers of electricity for covering transmission system losses and realization of compensation programs for the purpose of invoicing, as well as to the market operator for the purposes of billing deviations in accordance with the Market Rules.

TSO shall determine transmission system losses for every hour separately and deliver data on determined level of losses to the Market Operator.

TSO shall deliver to the Market operator verified metering data that have become official. The Market Operator shall use these data to determine the cumulative deviation of electricity delivery/withdrawal from exchange programs, prepare financial accounting and market functioning analysis.

Allocation and Use of Cross-Border Transmission Capacities

Capacity Allocation Procedure

Article 198

TSO is responsible for the approval and realization of use of cross-border transmission capacities.

The allocation and use of transmission capacity must be in compliance with the law governing the issue of cross-border exchanges in electricity and regulations governing the allocation of capacity and congestion management, as well as the long-term allocation of capacity, as determined by the Government.

TSO may delegate the capacity allocation procedure at day-ahead level and long time periods to a special entity, which performs coordinated capacity allocation.

TSO may delegate the capacity allocation procedure at day ahead level and short time periods to a special entity, which is responsible for market coupling in accordance with the Law.

Capacity Calculation

Article 199

TSO shall calculate available cross-border transmission capacity in cooperation with system operators in the interconnection, and in accordance with the Government's regulation, for every border on annual, monthly and daily basis.

Calculation of cross-border transmission capacity referred to in paragraph 1 herein takes account of planned operational states in the electric power system in the region for respective time frame, and technical criteria set under provisions referred to in Article 134 herein.

Use Requirements

Article 200

TSO, i.e. the special entity referred to in Article 198 paragraph 3 herein, shall publish necessary information and allocate cross-border transmission capacities in line with the guidelines for the allocation of cross-border transmission capacities and publish information related to transmission capacity allocation on its website.

After TSO, or the special entity referred to in Article 198 paragraph 3 herein, allocates rights to use cross-border transmission capacity to market players, these market players are entitled, within the preparation and changes of exchange program, to report cross-border electricity exchanges within the allocated right.

The guidelines referred to in paragraph 1 herein shall determine the manner and conditions for curtailment of the already allocated capacity, in cases when it is necessary to preserve system operation security.

VIII. DISPUTE SETTLEMENT

Noncompliance of User

Article 201

Based on the available data, TSO verifies compliance with the provision of the Code and identifies all violations on the part of a user.

TSO is entitled to request from the user all information required to investigate possible non- compliance with this Code.

In case non-compliance with this Code is determined, (Such as: alteration of characteristic of the devices connected to the transmission network or interventions on devises owned by TSO without previous consent of TSO, failure to comply with the TSO's operational orders, unauthorized withdrawal or injecting electricity into the grid, TSO shall issue to the user a warning that includes:

1) non-compliance description,
2) required timeframe for removing the irregularities namely restoration of normal use of the system.

In case the user fails to remove the irregularities within the time frame referred to in paragraph 3 above, TSO is entitled to cancel services to the user.

TSO notifies the Agency of taking measures referred to in paragraph 4 herein, no later than 3 days before starting the measures.

Noncompliance of TSO

Article 202

Any user considering that there is a TSO's non-compliance with this Code is entitled to inform TSO herein.

TSO has the obligation to conduct internal control with a view to investigating respective non-compliance and within 15 days upon receipt of notification to remove any drawbacks and/or inform the user about the investigation results.

Material Liability of TSO and Users

Article 203

Any liability of TSO or a transmission system user in their mutual relation arising from a failure to carry out their responsibilities ensuing from this Code is limited to immediate material damage as a direct result of their behaviour.

This excludes any liability of parties for collateral damages or profit loss.

TSO's liability for damages incurred to users due to non-compliance with the Code is strictly limited to cases of fraud, corruption and/or utter negligence.

IX. TRANSITIONAL PROVISIONS

Revision of the Code

Initiative for Amendments

Article 204

Initiative for amendments to this Code may be launched by the Agency, TSO, users of the transmission system that have signed contracts, prescribed by this Code.

Propositions for amendments to this Code are se submitted to the TSO that shall decide thereon within 60 days from the submission date.

Amendments to this Code are carried out in line with the relevant adoption procedure.

Unforeseen Circumstances

Article 205

(In case of circumstances that are not provided in the Code, or the occurrence of which could not be prevented, and the effects thereof may result in altered technical conditions (parameters) in the transmission system and cause effects on the users of the transmission system, the TSO is entitled to take measures in case of unforeseen circumstances.

In the circumstances referred to in paragraph 1 of this Article, TSO shall adopt decisions on measures and actions in urgent consultation to the extent appropriate with all the users concerned.

When adopting the decisions referred to in paragraph 2 of this Article, TSO shall take into account the views of users and take measures with the smallest negative impact on the system and system users.

The user is required to abide by the instructions issued by TSO, provided that the instructions are consistent with existing technical parameters of the system users, registered in accordance with this Code.

TSO shall inform the Agency of all unforeseen circumstances and relevant decisions in accordance with this Code.

TSO is obliged to prepare a report on the implementation of measures in case of unforeseen circumstances, the manner and procedure for the preparation of special reports on the transmission system operation, in which, inter alia, state causes of the occurrence of unforeseen circumstances, the measures taken and the consequences of the effects of unforeseen circumstances.

Vested Rights

Article 206

The provisions of the Contract on connection to the electricity transmission system concluded based on the Energy Law (Official Gazette of Montenegro, no. 05/16 and 51/17), or previously applicable Law, shall apply to users connected to the transmission system on the day of entry into force of this Code, while in case of changes in the technical and operational characteristics of the facilities of these users, the provisions of this Code governing the procedure of connection to the electricity transmission system shall apply.

The provisions of Article 63 herein shall not apply to users connected to the transmission system at the voltage level of 220 kV on the day of entry into force of this Code and they shall remain connected at the same voltage level.

Electricity Metering

Article 207

Installed metering equipment (transformers and measuring devices) that do not meet the criteria of this Code may be used up to the first major reconstruction of the facility, which requires issuance of TSO approvals.

Request for Exemption from Compliance with provisions of the Code

Submission of Request

Article 208

If a user finds that it is not, or will not be able to comply with any of the provisions of the Code, it is obliged to immediately submit to TSO a request for exemption from the obligations of the Code, with a detailed explanation.

The request referred to in paragraph 1 herein shall include:

1) provision of the Code related to the exemption request,
2) identification of facility and/or devices subject to exemption and, if important, description and duration of the exemption,
3) detailed explanations for exemption request,
4) suggested measures to overcome the issues resulting in requirement for exemption request, and also suggested measures to overcome the consequences relating to exemption during proposed timeframe, and
5) exemption timeframe.

Exemption Decision

Article 209

TSO shall make the decision relating to submitted request within 30 days following its receipt.

Exemption decision referred to in paragraph 1 herein shall include:

1) provision of the Code related to the exemption request,
2) the reason for exemption request,
3) identification of facility and/or devices subject to exemption and, if important, description and duration of the exemption, and
4) the date until exemption is in effect.

TSO is obliged to allow the user the right to appeal against the decision referred to in paragraph 1 of this Article, in dispute resolution process between energy entities and users, conducted by the Agency, in accordance with Article 57 of the Law.

Register of Exemptions

Article 210

TSO shall keep the register of exemptions with indication of the name of the entity at the request of which the exemption has been approved and provision of the Code relating to the exemption request and timeframe of the exemption period.

The register of exemptions referred to in paragraph 1 herein is public.

Application of Strategic Documents

Article 211

The Energy Development Strategy of Montenegro until 2030 or another valid act shall be applied until the adoption of the National Energy and Climate Plan in accordance with the Law.

X. FINAL PROVISIONS

Appendixes

Article 212

The Code comprises following appendixes:

1) Appendix 1: Application for connection to the transmission system,
2) Appendix 2: Application for conclusion of Use Contract,
3) Appendix 3: Standard contracts, which include:
   - Appendix 3.1a: Contract on the construction of connection infrastructure and connection to transmission system in case when the connection infrastructure is built by the Investor,
   - Appendix 3.1b: Contract on the construction of connection infrastructure and the connection to transmission system in case when the connection infrastructure is built by CGES,
   - Appendix 3.2: Contract on use of transmission system,
   - Appendix 3.3: Contract on purchase of ancillary services and balance energy,
   - Appendix 3.4: Contract on purchase of electricity for coverage of transmission system losses,
   - Appendix 3.5: Contract on assigning right to access cross-border transmission capacities,
   - Appendix 3.6: Registration form for participation in daily auctions,
5) Appendix 4: General requirements in terms of frequency,
6) Appendix 5: General requirements in terms of voltage.

Entry into Force

Article 213

This Code shall become effective on the eighth day upon its publication.

As of the date of entry into force of this Code, the Transmission Grid Code (Official Gazette of Montenegro no. 80/17 and 90/17) shall cease to be valid.

Number:

Podgorica, ____ 2021

Chairman of the Board of Directors

Aleksandar Mijušković, dipl.el.ing

APPENDIX 1
APPLICATION FOR CONNECTION TO THE TRANSMISSION SYSTEM

Application for connection to the transmission system

1.	**User/applicant data**			
1.1.	Name of the user			
1.2.	Type of the user		Producer	
			Direct consumer	
			Distribution system operator	
1.3.	Name of the facility the connection is applied for			
1.4.	Address of the facility			
1.5.	No. of cadastral plot of the facility (*enclose positional depiction of the facility*)			
1.6.	Reason for the application		Connection of the new facility	
			Increase of installed power of producers or increase of connected power of direct consumer	
			Modification of technical parameters of the connection	
			Connection of the new or increase of installed power for production at the direct consumer facility	
1.7.	Planned realization date for extension/construction (indicate per phase)			
1.8.	Planned connected power or power increase (MW)			
1.9.	User's address			
1.10.	User's phone			
1.11.	User's fax:			
1.12.	Responsible person	First and Family		
		Address		
		e-mail		
		Phone		

If the project is implemented in several phases, submit data 1.5, 1.7, 1.8. for each of the phases

FILLED BY PRODUCERS

2.	**Production facility data**		
2.1.	Type of the plant	Run-of-river hydro power plant	
		Reservoir hydro power plant	
		Pumped-storage hydro power plant	
		Thermal power plant	
		Combined heat and power plant	
		Wind power plant	
		Solar power plant	
		other *(specify)*:	
2.2.	Fuel (for thermal power plants and combined heat and power plant)	coal	
		gas	
		heavy fuel oil	
		other:	

2.3.	**Power Plant Energy Data :**	Existing	New
2.3.1.	No. of boilers		
2.3.2.	No. of generation units		
2.3.3.	No. of step-up transformers		
2.3.4.	Apparent power (MVA)		
2.3.5.	Active power (MW)		
2.3.6.	Reactive power (Mvar)		
2.3.7.	Maximal net power (MW)		
2.3.8.	Minimal net power (MW)		
2.3.9.	Available net power (MW)		
2.3.10.	Expected average yearly production (MWh)		
2.3.11.	Nominal voltage level of house load (kV)		
2.3.12.	Maximal active power of house load (MW)		
2.3.13.	Maximal reactive power of house load (Mvar)		
2.3.14.	Possibility for reactive power control (YES/NO)		

2.4.	**Generators data**		
2.4.1.	Number of generators		
2.4.2.	Type of generator		
2.4.3.	Apparent power (MVA)		
2.4.4.	Active power (MW)		
2.4.5.	Power factor		
2.4.6.	Nominal voltage (kV)		
2.4.7.	Type of excitation system (rotational/static)		
2.4.8.	Type of voltage control and system stabiliser		
2.4.9.	Short circuit coefficient (ratio)		
2.4.10.	Synchronous reactance (%)		
2.4.11.	Transient reactance (%)		
2.4.12.	Sub-transient reactance (%)		
2.4.13.	Time constant of damper winding (s)		
2.5.	**Turbine data**		
2.5.1	Number of turbines		
2.5.2.	Turbine type		
2.5.3.	Turbine installed power (MW)		
2.5.4.	Technical minimum (MW)		
2.5.5.	Discharge min/max (m3)		
2.6.	**Transformers data**		
2.6.1.	Number of transformers		
2.6.2	Nominal ratio (kV/kV)		
2.6.3.	Nominal power HV/LV1/LV2 (MVA)		
2.6.4.	Short circuit voltage (%)	$U_{k\ 1-2}$	
		$U_{k\ 1-3}$	
		$U_{k\ 2-3}$	
2.6.5.	Type of control (*under load, no load*)		
2.6.6.	Tap ratio range, regulation step (%)		
2.6.7.	Connection group		
2.6.8.	Reactance in positive sequence (zero regulation step)		
2.6.9.	Reactance in zero sequence		
2.6.10.	Neutral grounding		

If the producer has units, turbines or transformers with different characteristics, it is necessary to submit the required data from Table 2.4 2.5 or 2.6 for all of them.

FILLED BY DIRECT CONSUMER AND DSO

3.	**Data about facility subject to connection**		
3.1	Type of facility	Industrial facility	
		Industrial facility with generation unit	
		Traction substation	
		Common consumption	
		other:	
3.2.	**Energy data:**	Existing	New
3.2.1	Installed power of the facility (MVA)		
3.2.2.	Power factor (cosφ)		
3.2.3.	Expected maximal load (MW) [1]		
3.2.4.	Expected minimal load (MW) [1]		
3.2.5.	Expected daily load diagram (daily diagram of active and reactive power in winter and summer regime) given in Appendix (YES/NO)		
3.2.6.	Load sensitivity to voltage and frequency variations in transmission system (*describe*):		
3.2.7.	Maximal flicker level and harmonic content coming from the user's loads. Specific details of consumption must be specified if the user has industrial furnaces, rolling mills, traction stations and other consumers which can cause variation in supply of other users.		
3.2.8.	Data about cyclic variations of the active and reactive power of the load (>5 MVA/min.)		
3.2.9.	Active and reactive power gradient – increase/decrease (>5 MVA/min.)		
3.2.10.	Net production profile of all production units directly connected to the user's system (MWh)		
3.2.11.	Maximal power of production units (MW)		
3.2.12.	Expected average yearly production (MWh)		

[1] ... not including generation units

3.3.	**Transformers data**		
3.3.1.	Number of transformers		
3.3.2.	Nominal ratio (kV/kV)		
3.3.3.	Nominal power HV/LV1/LV2 (MVA)		
3.3.4.	Short circuit voltage (%)	$U_{k\ 1-2}$	
		$U_{k\ 1-3}$	
		$U_{k\ 2-3}$	
3.3.5.	Type of control (*under load, no load*)		
3.3.6.	Tap ratio range, regulation step (%)		
3.3.7.	Connection group		
3.3.8.	Reactance in positive sequence (zero regulation step)		
3.3.9.	Reactance in zero sequence		
3.3.10.	Neutral grounding		

If the direct consumer or DSO has transformers with different characteristics, it is necessary to submit the required data from Table 3.3 for all of them.

FILLED BY ALL USERS

Planned electricity consumption (including own production) or net electricity production

Connection year (20)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Energy (MWh)												
								Total [MWh]				

Connection year +1 (20_)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Energy (MWh)												
								Total [MWh]				

Connection year +2 (20_)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Energy (MWh)												
								Total [MWh]				

Connection year +3 (20_)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Energy (MWh)												
								Total [MWh]				

Connection year +4 (20_)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Energy (MWh)												
								Total [MWh]				

Appendices to the Application:

1. Capability chart of generation unit (producer)
2. Single line diagram of the facility

3. For direct consumers – general single line diagram of the supply for large consumers, CHP or compensation devices (>5 MVA)
4. Expected daily consumption profile (daily diagram of active and reactive power in winter and summer regime)

User's Responsible Party

_____

Note: TSO reserves the right to request additional information from the user for the purpose of preparation of the transmission system connection possibility analysis.

APPENDIX 2
APPLICATION FOR CONCLUSION OF CONTRACT ON USE

APPLICATION FOR CONCLUSION OF CONTRACT ON USE

1	Purpose of transmission system use	Choose an option (mark with ☑): ☐ For the needs of electricity generation ☐ For the needs of supplying direct consumers ☐ For the needs of electricity distribution ☐ For the needs of self-supply of electricity
2	Date and time of the beginning of the use of the service	__.__.____ at __:__
3	Date and time of the end of use of the service	__.__.____ at __:__
4	Username / Name and Surname	
5	User address	
6	Zip code and city	
7	TIN	
8	Authorized person	
9	Connection points where in-take or delivery takes place	
10	Total energy transferred	
11	Connection agreements	
12	Balance Responsibility Agreement	

Date and place

Applicant

APPENDIX 3: STANDARD CONTRACTS

Appendix 3.1 a: Contract on the construction of connection infrastructure and the connection to transmission system in case when the connection infrastructure is built by the Investor

CONTRACT ON THE CONSTRUCTION OF CONNECTION INFRASTRUCTURE *[INSERT: NAME OF THE FACILITY]* AND THE CONNECTION TO TRANSMISSION SYSTEM IN CASE WHEN THE CONNECTION INFRASTRUCTURE IS BUILT BY THE INVESTOR

(hereinafter referred to as: Contract)

between

Crnogorski elektroprenosni sistem AD, Podgorica
Bulevar Svetog Petra Cetinjskog 18
81000 Podgorica
TIN: 02751372
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as: **CGES**),

and

[Insert: Name of the user]
[*Insert*: User address]
[Insert: ZIP code and city]
TIN: *[Insert: TIN]*
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as**: Investor**),

or as a rule, hereinafter individually referred to as: Party or collectively referred to as: Parties

Introductory provisions

Article 1

(1) The Parties mutually acknowledge:

1) that the Investor on _____, submitted to CGES the Connection Application number _____of_____.

2) that CGES, at the expense of the Investor, made an Analysis of the possibility of connecting the Investor's facility to the electricity transmission system number__ of _____ (hereinafter: Analysis), which determined the conditions for connecting the Investor to the electricity transmission system, connection point of the Investor to the electricity transmission system and technical conditions for connection of the Investor to the electricity transmission system.

3) that the Transmission System Development Plan for the period _____ number___ of_____, envisages the construction of infrastructure necessary for connecting the Investor's facility and connecting the Investor to the electricity transmission system, as well as the manner, terms and conditions for connecting the Investor's facility to the electricity transmission system.

4) that the valid planning documents envisage the possibility of building the infrastructure necessary for the connection of the Investor to the transmission system and the construction of the investor's facility which is connected to the transmission system, i.e. the Plan_ adopted by _____.

5) that CGES and the Investor have agreed that the connections Infrastructure is built by the Investor.

6) that CGES, in accordance with the applicable regulations, determined the fee to the Investor for connection to the transmission system in the amount of _____, and that the Investor on _____ paid the fee for connection to the electricity transmission system in the determined amount.

Article 2

(1) The Parties agree that the definitions in this Contract shall have the meaning assigned to them in the Energy Law and the Rules for Electricity Transmission System Operation (hereinafter: the Transmission Grid Code).

Subject of the contract

Article 3

(1) The subject of this Contract is the regulation of mutual rights and obligations between the Contracting Parties regarding the construction of infrastructure necessary for the connection of the Investor to the electricity transmission system and the connection of the Investor's facility to the electricity transmission system.

(2) The Contracting Parties hereby determine connection requirements, connection point, amount of connection fee for connection power, method of connection, technical conditions and terms of connection, point and method of metering delivered energy, rights and obligations of CGES and Investors after connection.

(3) The requirements for the connection of the Investor to the electricity transmission system referred to in paragraph 2 of this Article as well as the Analysis, which is Addendum 1 to this Contract, shall be defined or prepared in accordance with technical standards and applicable regulations.

(4) The rights and obligations of CGES and the Investor by temporary connection and after connecting the investor's facility to the electricity transmission system and related to the operation of the connected facility will be regulated by the Contract on the use of electricity transmission system between CGES and the competent supplier.

Technical conditions for construction of connection infrastructure

Article 4

(1) The Parties acknowledge that the technical conditions for the connection of the Investor to the electricity transmission system have been issued by CGES and that they represent Addendum 2 to this Contract

Connection point and method of metering delivered energy

Article 5

(1) The connection point to the transmission system shall be determined in accordance with the results of the Analysis and is located at _____.

(2) The points and method of metering delivered electricity between CGES and the Investor's facility are defined in Addendum 3 to this Contract.

Communication systems

Article 6

(1) The Parties are required to have a reliable communication system to ensure continuous transmission of data and information, i.e. monitoring and control over the electric power system.

(2) CGES shall propose and approve Communication systems between CGES and the User communication systems. The User is not allowed to change technical characteristics of the communication system without prior approval of CGES. The user of the transmission system is obliged to provide compatible telecommunication equipment.

(3) The Parties are obliged to notify each other of the intention to change characteristics of their communication equipment, and of any noticed change in equipment.

(4) The Parties are obliged to maintain the communication system, which serves for the transmission of data and information, i.e. the electric power system monitoring and control, in proper condition, each in its own facility.

Work schedule and participation of CGES

Article 7

(1) The Investor is obliged to carry out all activities in accordance with the Work Plan given in Addendum 4 to this Contract.

(2) The plan referred to in paragraph 1 of this Article shall in particular contain clear timelines for the implementation of all significant activities for the construction of connection infrastructure, as follows:

1) commencement of construction
2) development and revision of the preliminary design
3) development and revision of the main design
4) the process of regulating property relations
5) obtaining permits from the relevant authorities
6) choice of equipment
7) procurement of equipment
8) FAT-Factory Acceptance Test
9) supervision over the execution of works on the construction of infrastructure
10) functional tests upon completion of works (Sat-Site Acceptance Test)
11) technical inspection
12) connection to the electricity transmission system for the purpose of temporary operation or trial operation
13) temporary operation or, trial operation
14) testing the compliance of work with technical parameters from the Code
15) obtaining a use permit
16) permanent operation
17) completion of construction.

(3) Within 7 days from the day of concluding this Contract, CGES will appoint its representatives by a special decision who will monitor the implementation of the infrastructure construction project for the connection of the Investor's facility.

(4) The decision referred to in paragraph 3 of this Article shall be delivered by the CGES to the Investor immediately upon its adoption.

(5) The investor is obliged to provide insight and monitoring of all phases of project implementation to the appointed representatives of CGES, and especially in the part of activities referred to in paragraph 2, items 2,3,6,8,9,10,11 and 12 of this Article.

(6) Representatives of CGES will be involved in these activities as part of a single team of Investor, or as a separate team, depending on the situation.

(7) The remarks of the CGES representatives in each of the mentioned activities will be binding for the Investor.

Purchase Contract

Article 8

(1) Pursuant to the provisions of Article 185 of the Energy Law, CGES shall purchase the constructed infrastructure for the needs of connecting the Investor to the electricity transmission system, which the investor built at its own expense for the needs of connecting the facility to the electricity transmission system, based on the purchase contract.

(2) The purchase contract referred to in paragraph 1 of this Article shall be concluded within six months from the day of obtaining the use permit or other act of the competent authority issued in accordance with the law.

(3) The purchase of the constructed infrastructure for the needs of the Investor's connection to the electricity transmission system shall be made in __ equal annuities starting from _____, in the amount of _____.

(4) The amount referred to in paragraph 3 of this Article shall be determined based on the assessment of an independent appraiser hired by CGES, in accordance with the provisions of Article 184 paragraph 1 of the Energy Law and interest accrued for a repayment period equal to the rate of return on borrowed capital, determined as a three-year weighted average of interest rates agreed on active long-term borrowings of network operators in Montenegro, which is valid for the regulatory year in which the purchase agreement is concluded.

(5) The independent appraiser referred to in paragraph 4 of this Article is obliged to apply the depreciation rates used by CGES for its fixed assets when appraising the infrastructure.

(6) CGES is obliged to ensure that the appraisal referred to in paragraph 4 is completed within 4 months from the date of obtaining the use permit or other act of the competent authority issued in accordance with the law.

(7) As of the day of the contract conclusion, the built connection infrastructure shall become an integral part of the transmission system and be recorded as a fixed asset in the business books of CGES.

Connection requirements and notification of fulfilment of the applicant's contractual obligations

Article 9

(1) The requirements for connecting the Investor's facility to the electricity transmission system are as follows:

1) That the Investor, for the infrastructure required for connection and the facility subject to connection to electricity transmission system, has been issued a use permit, i.e. another act of the competent authority in accordance with the law and

2) That the built infrastructure required for connection and the facility subject to connection to the electricity transmission system meet all technical requirements prescribed by the applicable regulations referred to in Article 3, paragraph 3 of this Contract and the Code.

(2) CGES is obliged to, within 15 days from the day of receipt of the notification on the fulfilment of the contractual obligations of the applicant, assess the fulfilment of the obligations from this Contract.

(3) In case the requirements referred to in paragraph 1 of this Article are met, CGES shall inform the Investor that it may conclude a supply contract with the selected supplier and other contracts in accordance with the Energy Law.

Connection term

Article 10

(1) CGES is obliged to connect the Investor's facility on the basis of the supply contract within a period that cannot be longer than seven days, from the day of reporting by the supplier that the supply contract has been concluded in accordance with the law.

Force majeure

Article 11

(1) The Parties shall be relieved of responsibility to fulfil obligations under this Contract during the force majeure.

(2) In terms of this Contract, under force majeure are implied natural events having characteristics of natural disasters (floods, earthquakes, fires, atmospheric discharges, winds, salt deposits, ice and snow that exceed projected values of parameters determined by technical standards for a certain facility or equipment of the competent operator etc.), which could not be predicted, prevented, avoided or eliminated by taking measures applied in order to maintain a safe and reliable operation of the electric power system, and which are determined based on report of a competent state authority, as well as in the event of state of emergency or war activities and measures introduced based on decision of competent state authorities.

(3) A Party referring to the effects of force majeure shall send a written notice to the other Party within three working days, stating character and commencement of the effect of force majeure. A notice of termination of the effect of force majeure shall be performed in the same manner.

(4) A Party shall not be liable for omissions in fulfilment of any of its contractual obligations, if the nonfulfillment is caused by the force majeure effect, during the course of event and one reasonable period after the end of effect necessary for the Party to continue with the fulfilment of contractual obligations.

(5) A Party that fails to notify the other Party within the period under Article item 3 herein shall not have the right to refer to force majeure as the reason for nonfulfillment of its contractual obligations.

Dispute resolution

Article 12

(1) The Parties shall endeavour to solve amicably any disputes arising out of interpretation or implementation of this Contract.

(2) To this end, the Party that initiates negotiations shall submit registered letter with a confirmation of receipt to the other Party, stating the following:

1) identification references to the contract (name and date of signature);

2) subject matter of dispute and brief description of actual status;

3) date and place of meeting for the purpose of reaching an amicable agreement.

(3) If it is not possible to reach an agreement within 30 days, or within any other time agreed between the Parties, the Parties hereby agree to entrust the resolution of the issue at dispute to the Energy and Water Regulatory Agency of Montenegro.

(4) The Parties hereby agree that each of the Parties may, until the decision of the Agency referred to in paragraph 3 of this Article, withdraw from resolving the dispute with the Agency, in which case they accept the jurisdiction of the Commercial Court in Podgorica.

Termination of the Contract

Article 13

(1) Each Party may terminate this Contract in case the other Party fails to comply with contractual obligations.

Amendments to the Contract

Article 14

(1) If in the course of the validity of this Contract any changes appear in legal or other regulations based on which this Contract is made or which may affect its implementation, the Parties agree that amendments to this Contract, in order to comply with new regulations, shall be performed with an Appendix to the Contract.

(2) If any provision of this Contract becomes invalid, it shall not apply, but with obligation of amending those provisions which are affected by that provision.

(3) In the case referred to in paragraph 2 herein, the Parties shall, in the form of Appendix to the Contract, regulate the matters that were subject of these provisions in accordance with the Law. Any amendment to the Contract shall be implemented through an annex to the Contract, which is made in six identical and original copies out of which each Party shall retain three copies.

Addendums

Article 15

(1) The following addendums make an integral part of this Contract:

- Addendum 1 Connection possibility analysis
- Addendum 2 Investor connection requirements
- Addendum 3 Points and method of metering delivered energy

- Addendum 4 Work schedule

Transitional and final provisions

Article 16

(1) Neither Party shall transfer any of its rights or obligations from this Contract to a third party without previous written consent by other Party.

(2) The Contract is made in six identical and original copies out of which each Party shall retain three copies.

(3) This Contract shall enter into force on the day of signing.

In Podgorica, *[Insert: date]* (year),

CGES	**Investor**
Executive Director *[Insert: name and surname]*	Executive Director *[Insert: name and surname]*

Addendum 1 Connection possibility analysis

Addendum 2 Investor connection requirements

Addendum 3 Points and method of metering delivered energy

Addendum 4 Work schedule

Appendix 3.1 a: Contract on the construction of connection infrastructure and the connection to transmission system in case when the connection infrastructure is built by CGES

CONTRACT ON THE CONSTRUCTION OF CONNECTION INFRASTRUCTURE *INSERT: NAME OF THE FACILITY]* AND THE CONNECTION TO TRANSMISSION SYSTEM IN CASE WHEN THE CONNECTION INFRASTRUCTURE IS BUILT BY CGES

(hereinafter referred to as: Contract)

between

Crnogorski elektroprenosni sistem AD, Podgorica
Bulevar Svetog Petra Cetinjskog 18
81000 Podgorica
TIN: 02751372
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as: **CGES**),

and

[Insert: Name of the user]
[*Insert*: User address]
[Insert: ZIP code and city]
TIN: *[Insert: TIN]*
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as**: Investor**),

or as a rule, hereinafter individually referred to as: Party or collectively referred to as: Parties

Introductory provisions

Article 1

(1) The Parties mutually acknowledge:

1) that the Investor on _____, submitted to CGES the Connection Application number _____of_____,

2) that CGES, at the expense of the Investor, made an Analysis of the possibility of connecting the Investor's facility to the electricity transmission system number__ of _____ (hereinafter: Analysis), which determined the requirements for connecting the Investor to the electricity transmission system, connection point of the Investor to the electricity transmission system and technical conditions for connection of the Investor to the electricity transmission system,

3) that the Transmission System Development Plan for the period _____ number___ of_____, envisages the construction of infrastructure necessary for connecting the Investor's facility and connecting the Investor to the electricity transmission system, as well as the manner, terms and conditions for connecting the Investor's facility to the electricity transmission system,

4) that the valid planning documents envisage the possibility of building the infrastructure necessary for the connection of the Investor to the transmission system and the construction

of the investor's facility that is connected to the transmission system, i.e. the Plan_ adopted by _____,

5) that CGES and the Investor have agreed that the connections Infrastructure is built by CGES,

6) that CGES, in accordance with the applicable regulations, determined the fee to the Investor for connection to the transmission system in the amount of _____, and that the Investor on _____ paid the fee for connection to the electricity transmission system in the determined amount,

Article 2

(1) The Parties agree that the definitions in this Contract shall have the meaning assigned to them in the Energy Law and the Rules for Electricity Transmission System Operation (hereinafter: the Transmission Grid Code).

Subject of the contract

Article 3

(1) The subject of this Contract is the regulation of mutual rights and obligations between the Contracting Parties regarding the construction of infrastructure necessary for the connection of the Investor to the electricity transmission system and the connection of the Investor's facility to the electricity transmission system.

(2) The Contracting Parties hereby determine connection requirements, connection point, amount of connection fee for connection power, method of connection, technical conditions and terms of connection, point and method of metering delivered energy, rights and obligations of CGES and Investors after connection.

(3) The requirements for the connection of the Investor to the electricity transmission system referred to in paragraph 2 of this Article as well as the Analysis, which represents Addendum 1 to this Contract, shall be defined or prepared in accordance with technical standards and the Regulation on requirement for connection of electricity producers to transmission and distribution grid (" Official Gazette of Montenegro ", No. 43/19), by the Regulation on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules , " Official Gazette of Montenegro ", No. 28/19) and the Regulation on the requirements for connecting consumers to the electricity transmission system ("Official Gazette of Montenegro", No. 28/19).

Technical conditions for construction of connection infrastructure

Article 4

(1) The Parties acknowledge that the technical conditions for the connection of the Investor to the electricity transmission system have been issued by CGES and that they represent Addendum 2 to this Contract.

Connection point and method of metering delivered energy

Article 5

(1) The connection point to the transmission system shall be determined in accordance with the results of the Analysis and is located at _____.

(2) The points and method of metering delivered electricity between CGES and the Investor's facility are defined in Addendum 3 to this Contract.

Communication systems

Article 6

(1) The Parties are required to have a reliable communication system to ensure continuous transmission of data and information, i.e. monitoring and control over the electric power system.

(2) CGES shall propose and approve Communication systems between CGES and the User communication systems. The User is not allowed to change technical characteristics of the communication system without prior approval of CGES. The user of the transmission system is obliged to provide compatible telecommunication equipment.

(3) The Parties are obliged to notify each other of the intention to change characteristics of their communication equipment, and of any noticed change in equipment.

(4) The Parties are obliged to maintain the communication system, which serves for the transmission of data and information, i.e. the electric power system monitoring and control, in proper condition, each in its own facility.

Connection requirements and notification of fulfilment of the applicant's contractual obligations

Article 7

(1) The requirements for connecting the Investor's facility to the electricity transmission system are as follows:

1) that the Investor, for the infrastructure required for connection and the facility subject to connection to electricity transmission system, has been issued a use permit, i.e. another act of the competent authority in accordance with the law, and

2) That the built infrastructure required for connection and the facility subject to connection to the electricity transmission system meet all technical requirements prescribed by the applicable regulations referred to in Article 3, paragraph 3 of this Contract and the Code.

(2) CGES is obliged to, within 15 days from the day of receipt of the notification on the fulfilment of the contractual obligations of the applicant, assess the fulfilment of the obligations from this Contract.

(3) In case the requirements referred to in paragraph 1 of this Article are met, CGES shall inform the Investor that it may conclude a supply contract with the selected supplier and other contracts in accordance with the Energy Law.

Connection term

Article 8

(1) CGES is obliged to connect the Investor's facility on the basis of the supply contract within a period that cannot be longer than seven days, from the day of reporting by the supplier that the supply contract has been concluded in accordance with the law.

Force majeure

Article 9

(1) The Parties shall be relieved of responsibility to fulfil obligations under this Contract during the force majeure.

(2) In terms of this Contract, under force majeure are implied natural events having characteristics of natural disasters (floods, earthquakes, fires, atmospheric discharges, winds, salt deposits, ice and snow that exceed projected values of parameters determined by technical standards for a certain facility or equipment of the competent operator etc.), which could not be predicted, prevented, avoided or eliminated by taking measures applied in order to maintain a safe and reliable operation of the electric power system, and which are determined based on report of a competent state authority, as well as in the event of state of emergency or war activities and measures introduced based on decision of competent state authorities.

(3) A Party referring to the effects of force majeure shall send a written notice to the other Party within three working days, stating character and commencement of the effect of force majeure. A notice of termination of the effect of force majeure shall be performed in the same manner.

(4) A Party shall not be liable for omissions in fulfilment of any of its contractual obligations, if the nonfulfillment is caused by the force majeure effect, during the course of event and one reasonable period after the end of effect necessary for the Party to continue with the fulfilment of contractual obligations.

(5) A Party that fails to notify the other Party within the period under Article item 3 herein shall not have the right to refer to force majeure as the reason for nonfulfillment of its contractual obligations.

Dispute resolution

Article 10

(1) The Parties shall endeavour to solve amicably any disputes arising out of interpretation or implementation of this Contract.

(2) To this end, the Party that initiates negotiations shall submit registered letter with a confirmation of receipt to the other Party, stating the following:

1) identification references to the contract (name and date of signature);

2) subject matter of dispute and brief description of actual status;

3) date and place of meeting for the purpose of reaching an amicable agreement.

(3) If it is not possible to reach an agreement within 30 days, or within any other time agreed between the Parties, the Parties hereby agree to entrust the resolution of the issue at dispute to the Energy and Water Regulatory Agency of Montenegro.

(4) The Parties hereby agree that each of the Parties may, until the decision of the Agency referred to in paragraph 3 of this Article, withdraw from resolving the dispute with the Agency, in which case they accept the jurisdiction of the Commercial Court in Podgorica.

Termination of the Contract

Article 11

(1) Each Party may terminate this Contract in case the other Party fails to comply with contractual obligations.

Amendments to the Contract

Article 12

(1) If in the course of the validity of this Contract any changes appear in legal or other regulations based on which this Contract is made or which may affect its implementation, the Parties agree that amendments to this Contract, in order to comply with new regulations, shall be performed with an Appendix to the Contract.

(2) If any provision of this Contract becomes invalid, it shall not apply, but with obligation of amending those provisions which are affected by that provision.

(3) In the case referred to in paragraph 2 herein, the Parties shall, in the form of Appendix to the Contract, regulate the matters that were subject of these provisions in accordance with the Law. Any amendment to the Contract shall be implemented through an Appendix to the Contract, which is made in six identical originals out of which each Party shall retain three originals.

Addendums

Article 13

(1) The following addendums make an integral part of this Contract:

- Addendum 1 Connection possibility analysis
- Addendum 2 Investor connection requirements
- Addendum 3 Points and method of metering delivered energy

Transitional and final provisions

Article 14

(1) Neither Party shall transfer any of its rights or obligations from this Contract to a third party without previous written consent by other Party.

(2) The Contract is made in six identical and original copies out of which each Party shall retain three copies.

(3) This Contract shall enter into force on the day of signing.

In Podgorica, *[Insert: date]* (year),

CGES	**Investor**
Executive Director	Executive Director
[Insert: name and surname]	*[Insert: name and surname]*

Addendum 1 Connection possibility analysis

Addendum 2 Investor connection requirements

Addendum 3 Points and method of metering delivered energy

Appendix 3.2: Contract on use of transmission system

CONTRACT ON USE OF TRANSMISSION SYSTEM FOR THE PURPOSE OF [SELECT: TAKEOVER OR GENERATION][1] OF ELECTRICITY FOR THE PERIOD FROM [INSERT: COMMENCEMENT DATE] TO [INSERT: COMPLETION DATE]

(hereinafter referred to as: the Contract)

between

Crnogorski elektroprenosni sistem AD, Podgorica
Bulevar Svetog Petra Cetinjskog 18
81000 Podgorica
TIN: 02751372
In the capacity of Transmission System Operator
Represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter to as: **Service Provider**),

and

[Insert: Name of the user]
[*Insert*: User address]
[Insert: ZIP code and city]
TIN: *[Insert: TIN]*
In the capacity of [Select: Type of User]
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as **Service User**),

or as a rule, hereinafter individually referred to as: Party or collectively referred to as: Parties

General provisions

Article 1

(1) Contract on use of transmission system for the purpose of electricity takeover (hereinafter referred to as: the Contract) stipulates the manner and conditions of electricity transmission system use for the supply of consumers in Montenegro.

(2) Access to cross-border transmission capacities is stipulated by a separate contract.

Article 2

(1) Under this Contract, the Service Provider of transmission system use and Service User shall stipulate issues of electricity transmission *for needs of supply*[2] of [Insert: for whose needs], and particularly:

1) manner of providing transmission system use,
2) duration of service, and contracted monthly power ,
3) technical and operational characteristics of the facility (communication systems, facility operation, occupational health and safety measures)
4) quality of electricity

[1] depending on the selected options the hereinafter is the text of the contract for the purpose of withdrawal (basic) or generation ("Alternative G")

[2] Alternatively G: "for the purpose of generation in the facilities'

5) billing metering points[3],
6) price, calculation and invoicing procedure for the service of transmission system use,
7) financial guarantees or other forms of security instruments to be provided by the Service User,
8) indemnification of the Service User in the event of failing to perform the service,
9) cases of service provision termination,
10) cases in which service use may be cancelled,
11) communication and exchange of information , and
12) period of application and entry into force of the Contract.

Manner of providing service of transmission system use

Article 3

(1) The Service Provider shall ensure transmission system use for needs of the User, in accordance with conditions laid down in the Rules of Electricity Transmission System Operation (Transmission Grid Code –hereinafter referred to as: the Code).

Article 4

(1) The Service Provider undertakes, for creating conditions referred to in Article 3 herein, to provide the Service User with the following:

1) capacity of exchange on takeover/delivery points in accordance with the agreed power from Article 5 paragraph 1 herein;
2) availability and quality parameters of the transmitted electricity in accordance with the Code and this Contract;
3) coverage of transmission system losses incurred due to electricity transmission for needs of the Service User;
4) balancing of deviation of actual consumption power of the Service User compared to the reported consumption power.

(2) Compensation of balancing costs from paragraph 1 item 4 herein is stipulated by the Contract on balance responsibility.

Duration and type of service

Article 5

(1) The Service User may use the transmission system for electricity transmission in the period from---------- [Insert: commencement date] to---------- [Insert: completion date].

(2) The contracted power is planned peak power by the User which is less than or equal to the connection power at takeover/delivery/ points and the same makes Addendum 1 of this Contract.

(3) Short-terms excesses of power from paragraph 2 herein are allowed up to the amount of total available power at the connection point, given in Addendum 24 of this Contract.

(4) In case of change of contracted power from paragraph 2 herein, the User shall submit a notice on the change not later than 15 days before the commencement of the month to which the change refers.

(5) The change referred to in paragraph 4 herein may be made once a year.

[3] Alternatively G: "the maximum power at the threshold of power plants"

[4] Alternatively G " "

Technical and operational characteristics of the facility

Article 6

(1) Technical and operational characteristics of energy facilities of the User and connection point are shown in Addendum 3: Single-line diagram and Addendum 4: Technical and operating characteristics.

(2) The parties are obliged to ensure that their facilities and equipment at the connection point meet the technical and operational exploitation criteria prescribed by the Code.

(3) Plants and devices of the User connected to the transmission system shall not affect, beyond the limits prescribed by this Contract expressly or generally by the Code, the security of the transmission system, including the limitations of high level harmonics, power factor, voltage changes, phase asymmetry and insulation coordination.

(4) CGES are obliged to promptly inform the User of any changes to its facilities and equipment, which can significantly affect the facilities and equipment of the User connected to the transmission system.

(5) The User shall promptly inform CGES of any planned changes in its facilities and equipment, which may affect transmission system functioning. The User must obtain a prior written consent of CGES for every change in devices affecting transmission network operation.

(6) In the event of changes in technical parameters of the plants and devices of the User, specified herein, it is necessary for the User to initiate the connection procedure in accordance with the law, in order for CGES as transmission system operator to decide on the possibility of changing the technical parameters of the User's plants and devices..

(7) At User request, CGES will provide information detailing the technical criteria for plant and devices of CGES and the User, relating to connection points as defined in Article 3 herein and are not defined in the Code.

(8) The User must enable CGES qualified personnel or its authorized persons to access plants and devices of the transmission system and auxiliary equipment owned by the User and to the test results and technical and operating characteristics of the plant and equipment of the User, in order to inspect compliance of the operation and characteristics of the User's plants and equipment with this Contract.

(9) CGES must enable User’s personnel access to plants and devices in its ownership, under the same conditions as laid down in paragraphs 8 and 9 herein.

Communication systems

Article 7

(1) The Parties are required to have a reliable communication system to ensure continuous exchange of data and information, i.e. monitoring and control over the electric power system.

(1) The User is not allowed to change technical characteristics of the communication system without prior consent of CGES.

(2) The Parties are obliged to notify each other of the intention to change characteristics of their communication equipment, and of any noticed change in equipment.

(3) The Parties are obliged to maintain the communication system serving for the transmission of data and information, i.e. the monitoring and control over the electric power system, in proper condition, each in its own facility.

(4) The user of the transmission system is obliged to inform the TSO in case of a malfunction on its telecommunication equipment and /or transmission path to the connection point to the telecommunication network of the TSO. The service provider is also obliged to report faults and interruptions in its communication equipment to the TSO.

Facility Operation

Article 8

(1) All manipulations at connection points shall be performed by the operating staff of *[Select: the User or CGES] [Select: exception]*

(2) Manipulations shall be performed upon CGES orders, in accordance with the Code and Facility Management Agreement (Addendum 5) that constitutes an integral part of this Contract.

(3) The Facility Management Agreement defines rules on operation at the connection point, with the aim of providing reliable and safe operation of transmission system and ensuring maximum use of apparatuses and devices belonging to transmission system and the User's system.

(4) Notwithstanding provisions of the Facility Management Agreement on the connection location, CGES has the right to, at any time depending on the operational conditions of transmission network, give order for changes of the announced operation regime and connection status of the elements of the User.

Maintenance and implementation of occupational safety and health measures

Article 9

(1) Each Party, for the apparatuses and devices that are under their ownership, shall perform maintenance of the apparatuses and devices in line with standards and instructions of the manufacturer, except for that part regulated by the separate Maintenance Agreement (if any).

(2) The User shall allow the technical staff of CGES to access the apparatuses and devices owned by CGES, namely:

1) for regular maintenance works 24 hours after receipt of notice from CGES,
2) for intervention works no later than 2 hours after receipt of notice from CGES.

(3) CGES shall allow the User's staff to access apparatuses and devices which are under their ownership, under the same conditions as laid down in paragraph 2 herein.

(4) When the User enters and performs works on its part of the facility, which is at the connection point in the ownership of CGES, the User shall work and act in accordance with the occupational safety and health rules set forth by CGES.

(5) When CGES enters and performs works on its part of the facility, which is at the connection point in the ownership of the User, CGES shall work and act in accordance with the occupational safety and health rules set forth by the User.

(6) The Parties shall define all details relating to the compliance with the occupational safety and health measures at the connection point in the Schedule of responsibilities at the connection point which is provided in Addendum 6 of this Contract.

(7) CGES is entitled to control at any time the status, testing results and report on the maintenance of facility and devices of the User at the connection point, which are part of the User's system, in order to check if maintenance is performed in the prescribed way.

(8) The User is entitled to control at any time the testing results and report on the maintenance of the facilities and devices owned by CGES, which are at the connection point, in order to check if maintenance is performed in the prescribed way.

Quality of electricity

Article 10

(1) *CGES and the User must comply with the technical characteristics and operating conditions prescribed in the Code.*

(2) *[Deviations from the limits specified in the Code are permitted only if they are specified in the following paragraphs of this Article.]*

(3) *[All plants and devices of the User, connected to the transmission system, as well as the transmission system itself, must have the technical capability to withstand the voltage fluctuation (flicker) and distortion in terms of harmonic content and phase disturbances within the limits defined in the Code.*

(4) *Short-circuit current at the connection points has a value less than [Insert: Permissible short-circuit current] kA.].*

(5) *[Under normal energy conditions, CGES is obliged to ensure that the voltage deviation at all points of connection to the transmission system is not outside the limits prescribed by the Code.*

(6) *[The content of the higher harmonics at the connection point must not exceed:*

(7) *[Insert: for each voltage level, the percentage of total harmonic distortion and the maximum percentage of individual harmonic distortion].]*

(8) *[The user's exchange of reactive power with the transmission system must be technically adjusted to meet the set values by CGES when they comply with the technical and operational characteristics of the facility from Addendum 3 to this Contract.]*

Billing metering points[5]

Article 11

(1) Billing metering points with identification marks of meters are provided in Addendum 7 herein.

(2) *Data read on billing metering points from paragraph 1 herein shall be used as elements for calculation of charge for the service of transmission system use.*

(3) In case of unavailability or inaccuracy of metering system on the billing metering point from paragraph 1 herein, calculation of charge shall be performed in manner laid down by the Code[6]

[5] Alternatively G: "billing elements"

[6] "Elements for the calculation of the transmission network use service are contracted power under Article 5, paragraph 2 of this Contract and the price for use of the transmission system of electricity that are paid by producers"

The fee for use of the transmission system

Article 12

(1) The Service Provider shall calculate the fee for use of the transmission system to the Service User on the basis of:

1) prices for engaged transmission capacity;
2) prices for the justified losses in the transmission system;
3) prices for overly withdrawn energy.[7]

(2) Prices from paragraph 1 herein shall be set in accordance with relevant acts of the Water and Energy Regulatory Agency setting the prices and fees for use of electricity transmission system and prices of ancillary services and balancing services.

Billing, invoicing and payment

Article 13

(1) The fee for service of using the transmission system shall be calculated in accordance with the Methodology for setting regulatory allowed revenue and prices for use of electricity transmission system:

(2) Billing period begins on the first day in a month at 00^{00}, and it ends on the last day in a month at 24^{00} hours.

Article 14

(1) The Service Provider shall submit to the Service User a report on the implementation delivery of electricity ad energy (active and reactive), based on data from Article 11 paragraph 2 herein.

(2) The Service User is entitled to appoint a representative that shall attend the taking over of metering data and drafting of report from paragraph 1 herein.[8]

(3) The Parties shall harmonize the report under the paragraph (1) of this Article by the third working day in a month for the previous month.

(4) In case they fail to harmonize the report, the Parties shall, for needs of implementation of this Contract, use the monthly report prepared by the Service Provider.

Article 15

(1) The Service Provider shall calculate to the Service User the fee for the service of use of transmission system in manner determined by the Methodology for setting regulatory allowed revenue and prices for use of electricity transmission system.

(2) In the event of interruption of supply to the Service User, the period of recovery of consumption for the period of 4 hours is excluded from the calculation of peak load.[9]

[7] Alternatively G: " "
8 Alternatively G:¨ ...¨
9 Alternatively G:¨ ...¨

Article 16

(1) The Service Provider shall calculate to the Service User a charge for overly withdrawn reactive energy in the manner determined by the Methodology for setting prices, deadlines and conditions for providing ancillary and balancing service of electricity transmission system[10].

Article 17

(1) The Service Provider shall invoice to the Service User the charge from Article 15 and 1611 herein in the billing period after expiration of the monthly billing period, up to the 10th day of the month for the previous month.

(2) The invoice for the services referred to in paragraph 1 of this Article shall be submitted in electronic form to the electronic address of the User specified in Addendum 8 - List of authorized personnel.

(3) The User has the right to object to the issued invoice referred to in paragraph 1 of this Article within three days from the day of receipt of the invoice.

(4) The Service Provider is obliged to decide on the objection referred to in paragraph 3 of this Article within three days from the day of receipt of the complaint.

(5) The User shall pay to the Service Provider the invoiced amount referred to in paragraph 1 within eight days from the day of submission of invoice, according to the instructions from the invoice, if the objection referred to in paragraph 3 of this Article has not been submitted, i.e. within three days from the day of reconciling the disputed part of the invoice between the Service Provider and the User if the objection has been submitted. If the Parties do not agree on the disputed part of the invoice within 60 days, the Parties have the right to initiate a dispute before the competent authority in order to finally resolve the disputed part of the invoice.

(6) In the event of delay in payment of charges from paragraph 1 herein, the User shall pay to the Service Provider a default interest pursuant to the Law.

Financial guarantees and other types of security

Article 18

(1) Financial guarantees and other types of security for receivables are: bank guarantee, dedicated (retention money), bill of exchange and other security instruments for receivables acceptable to the Service Provider[12].

(2) Service User shall provide the Service Provider with [insert financial guarantees and/or other security instrument] no later than 15 day following contract conclusion.

(3) If the Service User fails to provide [insert financial guarantees and/or other security instrument] in accordance with paragraph 2 of this Article, the Service Provider shall reserve the right to terminate this contract with prior notification of the Service User of contract termination without being held liable for any damage that may affect the Service User.

10 Alternatively G: "The Service Provider shall deliver to the User a calculation of fee for overly withdrawn reactive energy in the manner determined by the Methodology for setting prices, deadlines and conditions for the provision of ancillary services and electricity transmission system balancing services, based on which the amount of fee will be set that on this basis the Service Provider is entitled to."

11 Alternatively G: "Reduced by the amount of fees under Article 11"

12 Depending on the enclosed collateral, the Contract provisions relating to the enclosed collateral shall apply, while the Contract provisions of relating to other collateral shall be deleted.

(4) The Service provider may activate [insert financial guarantees and/or other security instrument] in case the Service User fails to perform or fails to regularly perform its obligations under this Contract.

(5) The Service User shall provide financial guarantees and/or other types of security for receivables for the period of contract validity and two months after the end of the period for which the contract was concluded, or from ___to ___ [insert date].

Bank guarantee

Article 19

(1) The Service User shall submit a bank guarantee in favour of the Service Provider, payable on first demand and without a right to objection issued by a bank having a solvency ratio in the latest available audit report in accordance with the regulations set forth by the Central Bank of Montenegro.

(2) The Service Provider should determine the content of the bank guarantee and the same is Addendum 9 of the Contract.

(3) The value of the first bank guarantee, with validity period of six months from the Contract effective date shall be determined in the amount equal to two-month fee for use of the transmission system, as estimated by the Service Provider, which the Service User would be required to pay in the event of using the system in accordance with the provisions of this Contract, amounting [insert: the value of the guarantee]_.

(4) The Parties hereby agree, upon expiry of the fifth month of warranty period to revise the submitted guarantee and to establish the value of the new guarantee in the amount of double average monthly invoices issued in accordance with this Contract in the past five months.

(5) The User is obliged to renew the bank guarantee, whereby the same shall come into force until the date of expiration of the previous bank guarantee and must have validity period of at least six months.

(6) If due to the outstanding financial obligations of the User, the Service Provider activates bank guarantee, the Service User shall submit within five days a new bank guarantee in favour of the Service Provider with the same conditions as the previous one and which shall be effective immediately.

Deposit

Article 19

(1) The User shall deposit in favour of the Service Provider dedicated (guarantee) funds on a special purpose account with a bank that has a solvency ratio in the latest available audit report in accordance with the regulations set forth by the Central Bank of Montenegro.

(2) The first dedicated (guarantee) deposit, with validity period of six months from the Contract effective date shall be determined in the amount equal to no less than three-month fee for use of the transmission system, as estimated by the Service Provider, which the User would be required to pay in the event of using the system in accordance with the provisions of this Contract, amounting [insert: the value of the deposit].

(3) The User, the Service Provider and the bank shall execute a tripartite agreement for administering a special purposes account referred to in paragraph 1 of Article herein.

(4) The Service Provider and the User agree that any proceeds (i.e. interests) and/or costs arising from the ownership of the special purpose account, referred to in paragraph 1 of Article herein, shall be in favour of and/or borne by the User.

(5) In case of outstanding liabilities by the Service User, the Service Provider has the right on first written demand made to the bank, to collect the amounts claimed from the User from the special purpose account.

(6) In case of the collection referred to in paragraph 5 herein, the User shall deposit within five days funds on the special purpose account in the manner defined herein.

(7) Dedicated (guarantee) deposit shall be deposited for not less than six-month period and must be determined in the amount of triple average monthly invoices issued in the past five months in accordance with this Contract.

(8) The User shall renew the funds deposited into a special purpose account in the amount calculated in accordance with paragraph 7 herein prior to the expiration of the guarantee period of a dedicated (guarantee) deposit.

Bills of exchange

Article 19

(1) The User is obliged to submit 12 (twelve) bills of exchange and 12 (twelve) bill of exchange authorizations for each bill of exchange to the Service Provider as a means of securing claims for obligations arising from this Contract, no later than 15 days from the day of concluding the Contract.

(2) If the User fails to enclose in accordance with paragraph 2 of this Article, bills of exchange and bill of exchange authorizations, the Service Provider reserves the right to terminate this Contract without liability for any damages that may occur to the User with prior termination notice to the User.

(3) The Service Provider may activate the submitted bills of exchange in the event that the User fails to perform or improperly performs its obligations under this Contract.

(4) The User is obliged to provide bills of exchange and bill of exchange authorizations for the duration of this Contract, i.e. until the final settlement of all obligations under this Contract.

Other security instruments

Article 19

(1) Other security instruments, or [insert name of security instrument], shall be provided by the User in the amount of at least quarterly fee for transmission system use as estimated by the Service Provider, or [insert amount].

(2) If the Service Provider due to unsettled financial liabilities by the User activates security instruments under paragraph 1 of this Article, the User shall within 15 days submit financial guarantees or other types of security for receivables in favour of the Service Provider in the amount under paragraph 1 of this Article.

Indemnification of the Service User

Article 20

(1) Setting and payment of eventual financial compensations based on nonfulfillment of minimum quality of electricity delivery and supply by system operators shall be performed pursuant to the Law and sublegal acts, based on determined responsibility of CGES, with providing evidence that payment of damage towards the distribution system user was performed.

Cases of interruption of service provision

Article 21

(1) CGES is entitled without being responsible, to terminate the provision of service of transmission network use:

1) in cases provided by the Law and the Code;
2) by order or instruction of the competent authority;
3) in cases of non-performance of contractual obligations within the agreed deadlines;
4) in case of any unauthorized change of technical parameters in relation to those according to which the connection was made;
5) in case of revocation of the License to the User;
6) if the User violates the provisions of this Contract, the violation of which may have a negative impact on the reliability and /or security of the operation of the transmission system;
7) if the User refuses access to CGES for the purpose of reading and control on commercial metering devices;
8) in case of termination or expiration of this Contract.

(2) CGES shall terminate the provision of the service of using the transmission system without its responsibility when the User has not concluded a supply contract, i.e. if it procures electricity on the market, it does not have a contract on electricity purchase no later than 23:00 before the start of electricity consumption it procures, regardless of the existence of a concluded contract on connection to the electricity transmission system, taking into account the technical and operational characteristics of the user's facility.

(3) CGES is entitled without being responsible, to temporarily suspend the provision of using the transmission system to the User at any time, without prior written notice, in the following circumstances:

1) prevention of threats to the health and safety of people and devices,
2) technical failures at the facilities of the User that compromise the reliable operation of the transmission system,
3) non-fulfilment of the CGES order, issued in accordance with the applicable regulations and this Contract , by the operational staff of the User,
4) other circumstances beyond the control of CGES that are not the result of any intentional activity or breach of this Contract and are not subject to planning, and
5) force majeure.

(4) In the cases referred to in paragraphs 1 and 2 of this Article, the User is not entitled to compensation from CGES on the basis of costs or possible damages, related or resulting from the disconnection.

(5) CGES shall notify the User of the disconnection referred to in paragraph 1 of this Article within a reasonable time, and no later than immediately before the disconnection, and of the disconnection referred to in paragraph 2 of this Article immediately after the disconnection or before disconnection if possible.

(6) After eliminating the reasons that led to the disconnection of the User, CGES will enable the reconnection of the User's facility as soon as possible.

(7) The User has the right to disconnect a part of his facility or a complete facility from the transmission system in order to prevent threatening dangers to health and safety of people and devices with the obligation to notify CGES within a reasonable time.

Communication and information exchange

Article 22

(1) The Parties agree to consider information mentioned in this Contract confidential and not to reveal it to any third party except for their legal and financial counsellors, auditors, correspondent bank, state or supervisory body which is responsible for the Party or if it may be requested according to law or some other regulations.

(2) Each Party shall before revealing confidential information send a written request for consent to other Party.

(3) The Parties agree to make all notices referring to this Agreement in a written form, via registered letter with a confirmation of the receipt, personal delivery with a delivery confirmation (signature on the receipt), fax or electronic mail with a confirmation of the receipt.

(4) The Parties shall define exchange of all necessary information in the course of the validity of this Contract, in the Protocol for Exchange of Information, Data and Reports in Addendum 10, which is an integral part of this Contract.

(5) Any information affecting the operation, readiness to operate, special circumstances and remedial maintenance of devices mentioned under Article 9 herein shall be exchanged between responsible representatives of the Parties in writing at the address, internet site or telefax, in accordance with paragraph 3 herein.

(6) In case of issuance of instructions for work and notices, confirmation of receipt thereof and notices on actual operational conditions, a mutual communication can be done also by phone, where all instructions and notices must be stated in a dispatch book and recording of all telephone conversations ensured.

(7) Responsible representatives of the Parties or their authorized persons shall all the time be available at the addresses or telephone numbers specified in item 8 of this Article.

(8) The information on authorized persons in charge of managing devices and switch manipulation are given in Addendum 6: Schedule of responsibilities at connection point.

Force majeure

Article 23

(1) The Parties shall be relieved of responsibility to fulfil obligations under this Contract during the force majeure.

(2) In terms of this Contract, under force majeure are implied natural events having characteristics of natural disasters (floods, earthquakes, fires, atmospheric discharges, winds, salt deposits, ice and snow that exceed projected values of parameters determined by technical standards for a certain facility or equipment of the competent operator etc.), which could not be predicted, prevented, avoided or eliminated by taking measures applied in order to maintain a safe and reliable operation of the electric power system, and which are determined based on report of a

competent state authority, as well as in the event of state of emergency or war activities and measures introduced based on decision of competent state authorities.

(3) A Party referring to the effects of force majeure shall immediately submit, and no later than three days, written notice to the other Party, stating character and commencement of the effect of force majeure.

(4) The same notification procedure shall apply in case of termination of the effects of force majeure.

(5) A Party that refers to the effect of force majeure shall prove the same upon request of the other Party, but the procedure of proving cannot in any case disturb further implementation of this Contract.

Releasing a User of liability

Article 24

(1) A Party shall not be liable for any omission in the fulfilment of any of its contractual obligations if a failure to fulfil obligations was caused by the effects of force majeure, during the force majeure and within reasonable period after termination of such effects that is needed for the Party to continue fulfilling its contractual obligations, i.e. to remove consequences to the effect of force majeure.

Delayed notification of the occurrence of force majeure

Article 25

(1) A Party that fails to notify the other Contracting Party within the deadline referred to under Article 23 paragraph 3 herein, shall not be entitled to refer to the effects of force majeure as a reason for failure to carry out its contractual obligations

Insurance

Article 26

(1) The Parties shall apply their own insurance policies in the implementation of this Agreement.

(2) At the request of one Party, the other Party shall submit to it the insurance policies referred to in paragraph 1 of this Article.

Termination of the Contract

Article 27

(1) Each Party may terminate this Contract in the event that the other Party fails to fulfil its contractual obligations.

(2) CGES may unilaterally terminate the contract if the security of the system and supply of other users is compromised due to the work of the User in violation of the Code and this Contract.

(3) The Party initiating the procedure of termination of this Contract shall forward the notice of intention to terminate the contract to the other party by registered letter with acknowledgment of receipt.

(4) Termination shall take effect on the first following working day after the expiration of 60 days from the date of receipt of the notice of intention to terminate, unless the Party failing to fulfil its

obligations responds or begins to fulfil its obligations or proves that non-fulfilment came about due to force majeure.

(5) The deadline referred to in paragraph 4 of this Article may be shortened, especially in the event that the safety of people and / or property and / or security of supply is compromised due to non-performance of contractual obligations. The deadline for termination of the Contract in this case is stated in the notice sent by fax and confirmed by registered letter confirming receipt.

(6) In case of termination of the Contract, the User is disconnected from the transmission system starting from the day of entry into force of the termination of this Contract.

Amendments to the Contract

Article 28

(1) If in the course of the validity of this Contract any changes appear in legal or other regulations based on which this Contract is made, the Parties agree to adjust this Contract with changed legal, i.e. secondary and other regulations via annex.

(2) If any provision of this Contract or its amendment is or becomes invalid, they shall be deemed as special provisions and shall not affect the validity of other provisions.

(3) In the case referred to under paragraph 2 herein, the Parties shall determine by mutual consent one or several provisions having the same or similar effect as a replacement for the invalid provisions, taking into consideration the purposes of this Contract.

(4) Any amendments to the Contract shall be implemented through an annex to the Contract, which is made in the same number of identical and original copies as basic contract.

Dispute resolution

Article 29

(1) The Parties shall endeavour to solve amicably any disputes arising out of interpretation or implementation of this Contract.

(2) To this end, the Party that initiates negotiations shall submit registered letter with a confirmation of receipt to the other Party, stating the following:

1) identification references to the contract (name and date of signature);
2) subject matter of dispute and brief description of actual status;
3) date and place of meeting for the purpose of reaching an amicable agreement.

(3) If it is not possible to reach an agreement within 30 days, or within any other time agreed between the Parties, the Parties hereby agree to entrust the resolution of the issue at dispute to the Energy and Water Regulatory Agency of Montenegro.

(4) The Parties hereby agree that each of the Parties may, until the decision of the Agency referred to in paragraph 3 of this Article, withdraw from resolving the dispute, in that case ,the Parties shall accept the jurisdiction of the Commercial Court of Montenegro.

Final provisions

Article 30

(1) The following addendums are an integral part of this Contract:

Addendum 1: Contracted power

Addendum 2: Available power values at connection points
Addendum 3: Single-line diagram
Addendum 4: Technical and operational characteristics of the facility
Addendum 5: Facility Management Agreement
Addendum 6: Schedule of responsibilities at connection points
Addendum 7: Billing metering points13
Addendum 8: List of authorized personnel
Addendum 9: Text of bank guarantee
Addendum 10: Information Exchange Protocol

Article 31

(1) This Contract is signed for a definite period of time, and it shall be applied from [Insert: commencement]_ to _[Insert: end]_ of the year.

Article 32

(1) The Contract is executed in six identical originals , of which each Party shall keep 3 originals.

In Podgorica, on *[Insert: date]*

Service Provider	**Service User**
Executive Director	Executive Director
[Insert: Name and surname]	*[Insert: Name and surname]*

[13] An alternative G: "Metering points for the purpose of reporting"

Addendum 1: Contracted power

SERVICE USER												
	Contracted Power by months [MW]											
Months	1	2	3	4	5	6	7	8	9	10	11	12
Hand over point												

Addendum 2: Available power values at connection points

Addendum 3: Single-line diagram

Basic data of the facility:

1.	Connected power (active power and cos φ)	
2.	Connection point	
3.	Connection voltage level	
4.	Insulation coordination	
5.	Existing and planned single line diagram	
6.	Protection scheme	
7.	Maximal and minimal short circuit power	
8.	Terms of automatic synchronization	
9.	Content of higher harmonics and flickers	
10.	Disconnection power	
11.	Neutral grounding	
12.	Minimal and maximal operation voltage, duration and level of short-term violations of minimal and maximal levels	
13.	Type and exchange range of reactive power and required reactive power reserves that must be installed in the devices by the user.	
14.	Voltage control scheme (reference value, accuracy, speed, operation in disturbed state)	
15.	Inclusion in under-frequency curtailment plan and limitations with energy deficiency on the electricity market	
16.	Inclusion in provision of ancillary services	
17.	Data on protection, metering and information equipment and metering devices	
18.	Way of metering and transfer of metered values of electrical variables predefined by TSO	
19.	Measures undertaken in case of large disturbance	

Table 1: Overhead line (for direct consumers with internal HV lines)

General data				
1.	Name of the line			
2.	Construction and reconstruction year			
3.	Line ownership, ownership and maintenance delimiting points			
Construction parameters		**variable**	**unit**	
4.	Line configuration – scheme			
5.	Distance from tower axis to phase conductors and ground wire	$a_{1,2,3,}\ a_4$	m	
6.	Height of phase conductions and ground wire from the ground	$h_{1,2,3,}\ h_4$	m	
7.	Sag	f	m	
8.	Cross-section and material type of phase conductors and ground wire	A	mm^2	
9.	No. of current circuits			
10.	No. of conductors per phase			
11.	No. and location of the towers			
12.	Average distance between towers	l_{sr}	m	
13.	Route length	l	km	
14.	Conductor length	L	km	
15.	Fibre-optic cables in ground wire (YES/NO)			
16.	Data on insulation (suspension) material			
Electrical parameters		**variable**	**unit**	
17.	Nominal current	I_n	A	
18.	Nominal voltage	U_n	kV	
19.	Apparent power	S_n	MVA	
20.	Charging power	Q_p	Mvar	
21.	Thermal current (winter, summer)	I_{th}	A	
22.	Thermal power (winter, summer)	S_{th}	MVA	
23.	Maximal allowed conductor temperature	□	ºC	
24.	Wave resistance	Z_v	□	
25.	Resistance in positive sequence	R_1	□	

26.	Reactance in positive sequence	X_1	□	
27.	Capacitance in positive sequence	C_1	□F	
28.	Susceptance	G	mS	
29.	Resistance in zero sequence	R_0	□	
30.	Reactance in zero sequence	X_0	□	
31.	Capacitance in zero sequence	C_0	□F	
32.	Mutual resistance in positive sequence	R_{1m}	□	
33.	Mutual reactance in positive sequence	X_{1m}	□	
34.	Mutual resistance in zero sequence	R_{0m}	□	
35.	Mutual reactance in zero sequence	X_{0m}	□	
36.	Short circuit power limit at the beginning of the line	$S_{sc\_max\_b}$	MVA	
37.	Short circuit power limit at the end of the line	$S_{sc\_max\_e}$	MVA	
38.	Reduction factor	r		
OHL designated bay				
39.	Name of OHL bay			
40.	Construction year			
41.	Bay ownership and maintenance			
Technical data of designated bays – nominal current of the element				
42.	Q0, Q1 (Q2, Q3), Q7, Q8, Q9… (nominal current, construction year)			
43.	Current transformer (primary ratio, maximal current)			
44.	Voltage transformer			
45.	Surge arresters			
Data on bay connected relay protection devices				
46.	Protection type (enumerate)			
47.	ARS (activated: yes/no)			
48.	Overload protection (current level and time at which the line trips)			
49.	Possibility for error location (yes/no)			
50.	Distant protection transfer (yes/no)			
Data on bay connected remote control devices				
51.	Type of metering converter			
52.	Type of devices for remote control			

53.	Direction of remote transfer	
54.	Possibility and parameter settings for synchronization	
Data on accounting metering devices in bays		
55.	Type of active power metering device	
56.	Type of reactive power metering device	
57.	Type of accounting meter	
58.	Direction of remote transfer	

Table 2: Transformer

General data				
1.	Substation name			
2.	Year of construction/reconstruction			
3.	Transformer ownership and maintenance			
4.	Transformer type			
Electrical parameters		**variable**	**unit**	
5.	No. of windings (two, three)			
6.	Nominal apparent power of primary, secondary and tertiary winding	$S_{n\_1,2,3}$	MVA	
7.	Nominal voltage of primary, secondary and tertiary winding	$U_{n\_1,2,3}$	kV+/-%	
8.	Maximal voltage of primary, secondary and tertiary winding	$U_{max\_1,2,3}$	kV	
9.	Nominal current of primary, secondary and tertiary winding	$I_{n\_1,2,3}$	A	
10.	Short circuit power limit at primary, secondary and tertiary side	$S_{sc\_max\_1,2,3}$	MVA	
11.	Frequency	f	Hz	
12.	Connection type			
13.	Neutral grounding (NO / fixed / through disconnector)			
14.	Type and cooling losses	P_n	kW	
Winding losses (primary, secondary, tertiary)				
15.	Open-circuit losses (in iron P_{fe})	P_0	kW	
16.	Short circuit losses (in copper P_{cu})	P_k	kW	
17.	Open circuit current	i_0	%	

18.	Short circuit voltages between the windings (prim-sec, prim-tert, sec-tert) at the lowest, neutral and highest tap position	u_k	%	
Voltage control				
19.	Regulating winding (primary, secondary, tertiary)			
20.	No. of tap positions and step level on regulating side		%	
21.	Lowest, neutral and highest tap position			
22.	Voltage at the lowest/highest tap position (e.g. -20% / +20%)	$U_{min, max}$	% / kV	
23.	Resistance and reactance of all windings (positive, negative and zero sequence – short circuit and open circuit) and grounding	R, X	□	
Transformer designated bay				
24.	Bay name			
25.	Construction year			
26.	Bay ownership and maintenance			
Technical data of transformer designated bays				
27.	Q0, Q1 (Q2, Q3), Q8… (breaker type, nominal current, construction year)			
28.	Current transformer (primary ratio, maximal current)			
29.	Voltage transformer			
30.	Surge arrester			
Data on bay connected relay protection devices				
31.	Protection type (enumerate)			
32.	Overload protection (current level and time at which the transformer trips)			
Data on bay connected remote control devices				
33.	Type of metering converter			
34.	Type of devices for remote control			
35.	Direction of remote transfer			
36.	Possibility and parameter settings for synchronization			
Data on bay connected accounting metering devices				
37.	Type of active energy metering device			
38.	Type of reactive energy metering device			
39.	Type of accounting meter			
40.	Direction of remote transfer			

Table 3: Generation unit (generator + excitation system + turbine)

Basic data				
1.	Owner			
2.	Location			
3.	Year of construction/reconstruction			
Generator and excitation		**variable**	**unit**	
4.	Generator type			
5.	Nominal apparent power of the generator	S_n	MVA	
6.	Nominal active power	P_n	MW	
7.	Nominal terminal voltage of the generator	U_n	kV	
8.	Nominal current	I_n	A	
9.	Nominal power factor	cos□		
10.	Frequency	f	Hz	
11.	Nominal rotation speed of the rotor	n	o/min	
12.	Nominal terminal active power of the generator (turbine + generator)	P_{st_max}	MW	
13.	Maximal allowed active power of the generator	P_{max}	MW	
14.	Minimal allowed active power of the generator	P_{min}	MW	
15.	Damper winding (YES/NO)			
16.	Participation in secondary control (YES/NO)			
17.	Black start possibility (YES/NO)			
Excitation system				
18.	Open circuit excitation current for nominal stator voltage	I_{m0}	A	
19.	Excitation current for nominal stator current	I_{mk}	A	
20.	Excitation current at I_n, U_n, cos□□= 1	I_{mn0}	A	
21.	synchronous machine short circuit currents	SRC		
Computer model and parameters of the excitation system				
22.	Model, type			
23.	Excitation nominal power	P_{nu}	kW	
24.	Excitation nominal voltage	U_{nu}	V	
25.	Excitation nominal current	I_{nu}	A	
26.	Excitation maximal voltage	U_{u_max}	kV	
27.	Excitation minimal voltage	U_{u_min}	kV	

28.	Excitation system gain coefficient	K_A		
29.	Control range		%	
30.	Power System Stabiliser YES/NO			
Turbine		**variable**	**unit**	
31.	Type and turbine block diagram			
32.	Nominal power of turbine	P_n	MW	
33.	Maximal active power on generator shaft	P_{max}	MW	
34.	Minimal active power on generator shaft	P_{min}	MW	
35.	Power increase gradient limit	G_d	MW/s	
36.	Power decrease gradient limit	G_s	MW/s	
37.	Type and block diagram of turbine regulator			
38.	Regulation energy	K_T	MW/Hz	
39.	Permanent drop of turbine regulator	s	%	
40.	Zero Suppression	Δf	+/- mHz	
41.	Time constant of turbine regulator	T_c	s	
Other generator data		**variable**	**unit**	
42.	Time constants of rotor and stator winding (synchronous, subtransient, transient) in short circuit and/or open circuit of stator winding, DC time constant		S	
43.	Resistance and reactance of rotor and stator (synchronous, subtransient, transient, saturated and/or non-saturated – in positive, negative and zero sequence)		□/%	
44.	Neutral grounding (direct, through R/X, isolated)			
45.	Ohm resistance of neutral grounding	R_E	□	
46.	Ohm reactance of neutral grounding	X_E	□	
47.	Generator losses		kW	
Characteristics / diagrams				
48.	Capability Chart	GCD		
49.	Open Circuit Characteristic	GOCC		
50.	Short Circuit Characteristic	GSCC		
51.	Metering of turbine control characteristics (frequency and voltage related)			
Efficiency				

52.	Generator efficiency	η_{gen}	%	
53.	Turbine efficiency	η_{tur}	%	
54.	Generation unit efficiency	η_{agr}	%	
Moment of inertia				
55.	Generator rotor moment of inertia	mD^2_{gen}	tm2	
56.	Turbine moment of inertia	mD^2_{tur}	tm2	
57.	Excitation moment of inertia	mD^2_{exc}	tm2	
58.	Moment of inertia of rotating parts of generation unit (turbine + generator + excitation)	mD^2_{gu}	tm2	
59.	Generator/generation unit inertia constant (mechanical or start-up time constant)	H	MWs/MVA	
60.	Generator protection (excitation loss, under-excitation and over-excitation protection)			
61.	Designated water accumulation (table 4) / boiler (table 5			

Table 3-A: Hydro turbine

Hydro turbine		**variable**	**unit**	
1.	Operation diagram			
2.	Water reservoir			
3.	Gross head	H_g	m	
4.	Net head	H_n	m	
5.	Temporary Droop	R_T		
6.	Permanent Droop	R_P		
7.	Reset Time	T_R	s	
8.	Water time constant of hydro unit	T_W	s	

Table 3-B: Gas turbine

Gas turbine		variable	unit	
1.	Gas turbine time constant	T_G	s	
2.	Multiplication factor of gas turbine	P_{Br}		
3.	Proportional factor of gas turbine	K_G		
4.	Cold start-up time	t	h	
5.	Warm start-up time	t	h	

Table 3-C: Steam turbine

Steam turbine		variable	unit	
1.	Steam Chest Time Constant	T_{CH}	s	
2.	Reheat Time Constant	T_{rh}	s	
3.	Crossover Time Constant	T_{CO}	s	
4.	Low Pressure Turbine Power Fraction	F_{LP}		
5.	Intermediate Pressure Turbine Power Fraction	F_{IP}		
6.	High Pressure Turbine Power Fraction	F_{HP}		
7.	Cold start-up time	t	h	
8.	Warm start-up time	t	h	

Table 3-D: Wind turbine

Wind turbine		
1.	Diagram of wind turbine and its parameters	

Table 4: Reservoir

Basic data		**variable**	**unit**	
1.	Name			
2.	Owner			
3.	River			
4.	Reservoir type (daily, weekly, yearly)			
5.	Reservoir capacity – gross energy	W_{gross}	MWh	
6.	Total reservoir capacity	V_{total}	hm^3	
7.	Usable capacity	V_{usable}	hm^3	
8.	Upper water level	H_u	m	
9.	Lower water level	H_l	m	
10.	Reservoir discharge time		h	
11.	Maximal permissible water level gradient		m/h	
12.	Spillway capacity		m^3/s	
13.	Operation permit validity			

Table 5: Boiler

Basic data		**variable**	**unit**	
1.	Boiler type and scheme			
2.	Type of boiler control and scheme			
3.	Fuel			
4.	Cold start-up time	T_{b_cold}	h	
5.	Warm start-up time	T_{b_warm}	h	

Table 6: Systems for compensation

Basic data				
1.	Substation name			
2.	Year of construction/reconstruction			
3.	Ownership and maintenance			
4.	Type (reactance, capacitor, static var compensator)			
Electrical parameters		**variable**	**unit**	
5.	Nominal apparent power	S_n	Mvar	
6.	Nominal voltage	U_n	kV	
7.	Connection voltage	U_n	kV	
8.	Busbar or tertiary winding connection			
9.	Iron losses	P_{Fe}	kW	
10.	Winding losses	P_{Cu}	kW	
11.	Total losses	P_{loss}	kW	
12.	No. of elements			
13.	No. of blocks			
14.	Block power		Mvar	
15.	For static var compensator: characteristic of connecting transformer, I/O characteristic, control scheme with relating parameters			

Jurisdiction of the contracting parties regarding management	1.
Jurisdiction of the contracting parties with regard to switching operations (manipulations)	1. The user undertakes to prepare appropriate switching operation manual
Presence of operational staff in facilities	1.
Method of performing switching operations(manipulations)	1.

Addendum 6: Schedule of responsibilities at connection points

Responsibility for maintenance	1.
Responsibility in the area of occupational safety and health, protection of persons and property, environmental protection	1.
Responsibility for electricity metering	1.
Responsibility for relay protection	1.
Responsibility for addendum updating	1.

Addendum 7: Billing metering points[14]

[14] *Alternatively G:* "metering points for the reporting purposes''

Addendum 8: List of authorized personnel

Exchange and reconciliation of reports on the use of the transmission system::

CGES	USER

Billing and payment

CGES	USER

Contract Implementation

CGES	USER

Addendum 9: Text of bank guarantee

BANK GUARANTEE

Crnogorski elektroprenosni sistem AD

Bul. Sv. Petra Cetinjskog, no. 18
20000 Podgorica
Montenegro

…, dated …
Guarantee (reference. no. …)

PROVIDED THAT

- The Company …..... with registered office in .....…….., tax code/VAT identification number .....…, paid-in capital EUR .....…, registered within .....……, (hereinafter referred to as: the Service User) has concluded with Crnogorski elektroprenosni sistem AD (hereinafter referred to as: the Service Provider) the Contract on use of electricity transmission system no.....from ..... (hereinafter referred to as: Contract on use of electricity transmission system);

- The Service User shall provide in favour of the Service Provide an appropriate bank guarantee pursuant to Article 19 of the Contract on use of electricity transmission system;

- The Service User submitted a formal request for the abovementioned guarantee, in the maximum amount of EUR …….....,

- The Bank …..……. is in possession, directly or through a subsidiary, of a solvency ratio in line with the rules established by the Central Bank of Montenegro AD (hereinafter referred to as: the Bank).

IN VIEW OF THE ABOVE

The Bank ….....……., with registered office in … tax code ……., VAT identification number ……, represented by its legal representatives…… (hereinafter referred to as: the Bank), shall provide this guarantee in favour of the Service Provider according to terms and conditions indicated below and in accordance with provisions contained in the Contract on use of transmission system.

1. The guarantee is valid and effective from …… to …….. The requests for execution can be submitted within two months as of the indicated validity period, and after the expiry of such period, the guarantee will be considered devoid of any effectiveness, although not returned.

2. The Bank, irrevocably and unconditionally, shall guarantee the fulfilment of obligations assumes by the Company…… towards the Service Provider in the implementation of the Contract on use of transmission system, during the validity and effectiveness period of this guarantee.

3. As a result of what is envisaged in item 2 herein, the Bank commits to pay, on first demand of Service Provider, irrevocably and without delay, any amount requested by the Service Provider, without proceeding to any examination of reasons stated in the payment request, and regardless of any exception, challenge or objection which the Company ……. raised in this regard, up to the maximum amount of EUR ……,00 (……../00).

4. Following the receipt of the request from item 3 herein to be sent via registered mail with acknowledgment of receipt, anticipated by sending an electronic mail to the following address ……., the Bank will pay, within ten days of the date of receipt of the request, with value date on the same day, through a bank transfer the amount indicated in EUR in the payment request. If the payment date is a non-working day, the due date shall be extended to the first following working day.

5. It will be possible to enforce this guarantee also partially, remaining in any case valid and effective for the residual amount.

6. The Bank shall explicitly waive any protection, exception, right to compensation, complaint or request towards the Service Provider in relation to obligations assumed by this guarantee including, but not limited to, any protection, compensation, complaint or request that the Company ……..…… could file on whatever basis against the Service Provider.

7. Any communication related to this guarantee will have to be carried out through registered mail with acknowledgment of receipt, anticipated by sending an email to the following email address:

   for the Service Provider: office@cges.me

   for the bank: ….. (to insert email address).

8. (*) will be competent for any dispute arising from this act.

Addendum 10: Information Exchange Protocol

Type of information	1. Real-time data exchange. 2. Information and data necessary for the preparation of power system operation plans. 3. Emergency disconnection plan. 4. Underfrequency load shedding plan
Method of exchanging information	1. telephone line with the obligatory recording of conversations on the recording system, 2. by dispatches, 3. by fax documents, 4. By e-mail from the official address.

Appendix 3.3: Contract on purchase of ancillary services and balancing energy

CONTRACT ON PURCHASE OF ANCILLARY SERVICES AND BALANCING ENERGY

(hereinafter referred to as: the Contract)

between

Crnogorski elektroprenosni sistem AD, Podgorica
Bulevar Svetog Petra Cetinjskog 18
81000 Podgorica
TIN: 02751372
In capacity of Transmission System Operator
Represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as: **CGES**),

and

[Insert: Name of the Service Provider]
[*Insert*: Address]
[Insert: ZIP code and city]
TIN: *[Insert: TIN]*
In capacity of *[Insert type of service]*
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as **Service Provider**),

or as a rule, hereinafter individually referred to as: Party or collectively referred to as: Parties

I GENERAL PROVISIONS

Article 1

(1) The Contract shall regulate the issues related to the provision of:

- reserve of active power for primary control purposes;
- reserve of active power for secondary control purposes;
- reserve of active power for generating units tertiary control purposes and for the transmission system congestion elimination;
- reserve of active power for tertiary control through managing power consumption;
- electricity sale and purchase based on compensation programs;

- generation capacities and reactive power absorption in generating units for voltage control purposes;
- generation capacities and reactive power absorption in devices owned by the user for voltage control purposes;
- operational readiness of generating units for the restoration of electric power system following a black-out (black start), or island (isolated) operation of one part of the system.

(From the listed services select those a Contract is related to)

(2) With respect to the provision of ancillary services from the Article 1 hereof, the Parties shall determine:

- The scope of ancillary services including active power, reactive power, active and reactive energy, operational readiness and other energy-related and technical characteristics depending on the type of ancillary service;
- information on the facility from which ancillary service is provided including authorized personnel for cooperation in relation to the provision of ancillary services;
- Fees, accounting method, payments and terms and conditions of payments for ancillary services.

PRIMARY CONTROL

Article 2

(1) An ancillary service of primary control shall be provided by all generating units of the Service Provider:

(2) Energy-related and technical characteristics of generating units as referred in paragraph 1 hereof are provided in Addendum 2 which is an integral part of the Contract.

Article 3

(1) Through the planning of ancillary services, the Service Provider shall ensure continuous provision of ancillary service of primary control, within the framework of operational schedules of its generating capacities, so that the amount of primary reserve capacity for the change of active power in all generators planned to be in operation, shall amount to at least ± ……. MW.

(2) The Service Provider shall submit to CGES the list of engagements by 16:00 h day-ahead for the corresponding day. The list of engagements shall include following information:

- Day to which the list of engagements applies;
- List of capacities with the following information:
  - Identification code of the capacity;
  - Planned output by hour;
  - Capacity available for primary control.

Article 4

(1) If the Service Provider is unable to provide a reserve of secondary control referred to in Article 3 of this Contract with a daily schedule, it shall notify, in writing CGES before 12:00 on the day of registration of the daily schedule, stating reasons for it.

(2) If the Service Provider due to unforeseen circumstances (failure to generating units), occurred after the registration of daily schedule, concludes that it is unable to provide secondary reserve under Article 3 of this Contract, it shall promptly notify CGES thereof in writing.

Article 5

(1) Ancillary service of primary control is paid in the manner determined by the Methodology for setting prices, terms and conditions for the provision of ancillary services and balancing services of the electricity transmission system (hereinafter: the Methodology).

Article 6

(1) The Service Provider shall provide primary control of quality as prescribed in the Transmission Grid Code (the Code) and other applicable regulation.

(2) In case it is identified that the amount of available primary reserve does not meet the contracted amount under Article 3 hereof, CGES shall immediately inform the Service Provider thereof, in order to take steps to reach the contracted amount of primary reserve.

(3) CGES reserves the right to install the appropriate equipment in the in facility of the Service Provider, or its own facility, if that allows monitoring the quality of control, in order to verify the adequacy of the response of primary control.

Article 7

(1) CGES shall prepare monthly report on primary control service pursuant to this Contract and submit it to the Service Provider by 15th working day of the current month for the previous month.

SECONDARY CONTROL

Article 8

(1) The ancillary service of secondary control is provided by the following generating units owned by the Service Provider:

-
-
-

(1) Energy-related and technical characteristics of generating units that provide the service of secondary control are provided in Addendum 3 hereof, which is an integral part hereof.

Article 9

(1) Through the planning of ancillary services, the Service Provider shall, within the framework of operational schedules of its generating capacities, ensure the possibility to engage the secondary control and the control range as follows:

Year _____	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Range												

Article 10

(1) The Service Provider shall submit to CGES the resource engagement list for participation in the secondary control.

(2) CGES shall engage resources in real-time for the purposes of secondary control according to the list of engagements submitted by the Service Provider.

Article 11

(1) CGES shall establish the form, content and manner for the submission of the resource engagement list as referred in Article 10 of the Contract, paragraph 1 which should contain at least the following information:

- Day to which the list of engagements applies;
- List of capacities with the following information:
  - Identification code of the capacity;
  - Planned plant output by hour;
  - Capacity available for primary control
  - The resource engagement price (€/MWh).

(1) The Service Provider shall submit to CGES the list of engagements by 16:00 h day-ahead for the corresponding day.

(2) The Service Provider in case of changes in engagements of power plants within the daily schedule, shall submit the new list of engagements of secondary reserve for that day, as well as the time starting from which the new list of engagements gets operational, at least 15 minutes before it becomes effective.

Article 12

(1) If the Service Provider is unable to provide a reserve of secondary control referred to in Article 9 of this Contract with a daily schedule, it shall notify, in writing CGES before 12:00 on the day of registration of the daily schedule, stating reasons for it.

(2) If the Service Provider due to unforeseen circumstances (failure of generating units), occurred after the registration of daily schedule, concludes that it is unable to provide secondary reserve under Article 9 of this Contract, it shall promptly notify CGES thereof in writing.

(3) CGES reserves the right to, due to unforeseen circumstances (metering failure, unavailability of secondary control equipment, etc.) request the exclusion of the secondary control service by issuing an order to the responsible person of the Service Provider, in the form of a dispatch.

Article 13

(1) The Service Provider shall ensure metering of generation power (in real time) of generators involved in secondary control, continuous availability of local equipment for secondary control, compatible telecommunications equipment and the transmission path to the point of connection to the telecommunications network of CGES for transmitting measurements and signals for the secondary control from NDC to communication server of the generating units performing secondary control.

(2) The Service Provider will allow CGES remote control over the operation of generating unit controller involved in the secondary control or group controller, if exists in the plant.

Article 14

(1) Delivered electricity in secondary control at a specific hour is determined as a difference of registered and planned (base) generation of generating units in regulation established by the list of engagements separately for both upward and downward control.

(2) Registered generation of generating unit in the secondary control shall be determined based on the registered values of generation of generating unit involved in the control, on SCADA system in the National Dispatch Centre.

Article 15

(1) CGES and the Service Provider shall agree, no later than 3 working days after the date of delivery, on a price, amount of electricity delivered and determine the adequacy of supply within the meaning of Article 17 of this Contract.

(2) CGES shall prepare a monthly report on the availability and engagement of service of secondary control pursuant to this Contract and submit it to the Service Provider at latest by 7th day in the current month for the previous month.

Article 16

(1) Price for the secondary reserve engagement under Article 11 paragraph 2 hereof is established on the basis of a Methodology.

(2) Price for the lease of capacity reserve of secondary control shall be determined on the basis of a valid Decision on setting prices for the provision of ancillary services and balancing services to Crnogorski elektroprenosni system AD Podgorica (hereinafter referred to as: Decision), and amounts to _____ €/MW/h.

(3) Exceptionally, if the Service Provider makes available the reserve capacity only in one direction, the price for the lease of the secondary control capacity is determined in accordance with the Decision and amounts to _____ €/MW/h.

Article 17

(1) Secondary control is considered adequate in terms of this Contract for a specific hour, if satisfies quality criteria laid down in Code and the Methodology.

(2) Secondary control quality factor shall be determined by CGES in accordance with the Methodology.

GENERATING UNIT TERTIARY CONTROL AND TRANSMISSION SYSTEM CONGESTION ELIMINATION

Article 18

(1) The ancillary service of tertiary control shall be provided by the following generating units owned by the Service Provider.

-
-
-

(2) Energy-related and technical characteristics of generating units from the paragraph 1 hereof are provided in Addendum 4, which is an integral part hereof.

Article 19

(1) Through the planning of ancillary services, the Service Provider shall, within the framework of operational schedules of its generating units, ensure the possibility to engage tertiary control and the control range as follows:

1) For upward control
   - From D/M/Y to D/M/Y in the period from hh:mm to hh:mm
     _____ MW

2) For downward control
   - From D/M/Y to D/M/Y in the period from hh:mm to hh:mm

     _____ MW

(2) The provider shall make available to the TSO all available generation capacities that are not engaged in the work plan, outside the scope referred to in paragraph 1 of this Article.

Article 20

(1) The Service Provider shall submit separate lists of engagements for the upward tertiary control (engagements of positive tertiary reserve) and downward control (engagements of negative tertiary reserve).

(2) The sum of the reported amount of secondary and tertiary reserves may not be less than __ MW for upward control, or __ MW for downward control.

(3) CGES shall establish the form, content and manner for the submission of the list of resource engagements which shall include the following information:

- Direction of tertiary control to which the engagement list applies;
- Day to which the engagement list applies;
- List of capacities with the following information:
  - Identification code of the capacity;
  - Capacity available for engagement;
  - Price for capacity engagement, defined in Article 19, paragraph 2 of this Contract, separately for upward control and downward control (€/MWh).

(4) Submission of the list of resource engagement is also done through pre-defined forms through the Module for provision of ancillary services for SCADA/EMS system at CGES.

(5) The Service Provider shall submit to CGES the engagement list by 16:00 h day-ahead for the corresponding day.

(6) In case of changes in engagements of power plants within the daily schedule, the Service Provider shall submit the new list of engagements of reserve for that day, as well as the time starting from which the new list engagements gets operational, at least 15 minutes before its application, i.e. before the start of next hour .

Article 21

(1) If the Service Provider is unable to ensure tertiary reserve by daily schedule under Article 19 of this Contract, it shall notify CGES thereof in writing before 12:00 on the day of registration of the daily schedule stating reasons for it.

(2) If the Service Provider, due to unforeseen circumstances (failure to generating unit), occurred after the registration of daily schedule, concludes that it is unable to provide tertiary reserve under Article 19 of this Contract, it shall promptly notify CGES thereof in writing.

Article 22

(1) CGES shall engage real- time resources for tertiary control purposes by issuing an order to the person in charge of service provision, in form of dispatch, specifying the required diagram of delivery and exact time of the start and end of delivery.

(2) CGES engages resources in real time for the purpose of eliminating congestion in the transmission system, by issuing an order to the responsible person of the Service Provider, in the form of a dispatch, with the required delivery diagram, power plants to be engaged and the exact delivery start and end time.

Article 23

(1) The Service Provider shall provide metering of generation power of generating units involved in real time tertiary control, compatible telecommunications equipment and the transmission path to the point of connection to the telecommunications network of CGES for transmitting measurements to the NDC from generating units performing secondary control.

Article 24

(1) CGES and the Service Provider shall, not later than three working days after the delivery date, agree on daily quantities of mutually delivered electric energy and assess the adequacy of delivery.

(2) CGES prepares a monthly report on the provision of services of tertiary control and submits it to the Service Provider, at latest by 7th day of the current month for the previous month.

(3) Monthly report determines the adequacy and availability of delivery for the entire month and the total volumes of mutually delivered energy on the basis of tertiary control.

Article 25

(1) Price for availability of tertiary reserve referred to in Article 19, paragraph 1 of this Contract , item 1has been established on the basis of Methodology and Decision and is amounts to ----------€ MW/h.

(2) Price for engagement of tertiary control reserve shall be determined on the basis of the Methodology.

Article 26

(1) The adequacy of delivery and availability of service provision of reserving capacity shall be determined in accordance with the Methodology.

(2) In case of inadequate and unavailable services, the Service Provider is obliged to pay penalties to CGES in the amount set by the Methodology.

(3) The amount of the penalty based on the inadequate service referred to in paragraph 2 of this Article may not exceed the monthly invoice for the reservation of the tertiary reserve, calculated in accordance with the agreed volume of delivery for the respective month.

(4) The amount of the penalty based on the unavailability of the service referred to in paragraph 2 of this Article may not exceed the monthly invoice for the reservation of the tertiary reserve, calculated in accordance with the agreed volume of delivery for the respective month.

TERTIARY CONTROL THROUGH MANAGING POWER CONSUMPTION

Article 27

(1) The ancillary service of tertiary control shall be provided by the following consumption units owned by the Service Provider:

(1)
(2)
(3)

(2) Energy-related and technical characteristics of consumption units from the paragraph 1 hereof are provided in Addendum 5, which is an integral part hereof.

Article 28

(1) Through the planning of ancillary services, the Service Provider shall, within the framework of operational schedules of its consumption units, ensure the possibility to engage tertiary control and the control range for upward control:

From D/M/Y to D/M/Y in the period from hh:mm to hh:mm _____ MW except during the overhaul of TPP Pljevlja for _____ days.

(2) CGES shall inform the Service Provider about the period of overhaul of the Pljevlja thermal power plant defined in paragraph 1 of this Article 7 days before the start of works.

Article 29

(1) The Service Provider shall submit to CGES the consumption plan by 16:00 h day-ahead for the corresponding day which includes tertiary reserve availability plan, in hourly resolution.

(2) If the Service Provider, due to unforeseen circumstances (failure to consumption unit), concludes that it is unable to provide tertiary reserve under Article 28 of this Contract, it shall promptly notify CGES thereof in writing.

Article 30

(1) CGES shall engage real-time resources for tertiary control purposes by issuing an order to the person in charge of service provision, in form of dispatch, specifying the required reduction of power consumption and exact time of the start and end of reduction of power consumption.

(2) CGES and balance responsible entity to which balancing group the Service Provider belongs to shall exchange appropriate documents to ensure that transaction arranged by order under paragraph 1 above, is formally registered.

(3) The Service Provider will reduce power consumption in the required amount, at the latest within 15 minutes of receiving the order.

Article 31

(1) The Service Provider shall ensure measurement of power consumption of generators involved in real time tertiary control, compatible telecommunications equipment and the transmission path to the point of connection to the telecommunications network of CGES for transmitting measurements to the NDC from consumption units performing secondary control.

Article 32

(1) CGES and the Service Provider shall, not later than three working days after the delivery date, agree on daily quantities of mutually delivered electric energy and assess the adequacy of delivery.

(2) CGES prepares a monthly report on the provision of services of tertiary control and submits it to the Service Provider, at latest by 7th day of the current month for the previous month.

(3) Monthly report determines the adequacy and availability of delivery for the entire month and the total volumes of mutually delivered energy on the basis of tertiary control.

Article 33

(1) Price for availability of tertiary reserve referred to in Article 28 of this Contract has been set on the basis of the Methodology and Decision and is amounts to----------€ MW/month.

(2) Price for engagement of tertiary control reserve shall be set on the basis of a Methodology.

Article 34

(1) The adequacy of delivery and availability of service provision of reserving capacity shall be determined in accordance with the Methodology.

(2) In case of inadequate and unavailable services, the Service Provider is obliged to pay penalties to CGES in the amount set by the Methodology.

DELIVERY OR TAKE OVER OF ELECTRICITY ON THE BASIS OF COMPENSATION PROGRAMS

Article 35

(1) The Service Provider shall offer to CGES delivery or take-over of electricity on the basis of implementation of the respective control area compensation programs.

Article 36

(1) CGES shall inform the Service Provider in writing on the delivery diagram required (power in hourly resolution, duration of delivery, course of delivery - purchase or sale), no later than 10:00h before the start of realization.

(2) The price of energy referred to in paragraph 1 of this Article shall be determined on the basis of a Methodology.

(3) CGES and the Service Provider shall agree on the price of mutually delivered energy, no later than 3 days after the day of delivery.

Article 37

(1) CGES shall prepare monthly report on the provision of service of delivery or take-over of electricity based on compensation program and submit it to the Service Provider at latest by the 7th day of the current month for the previous month.

VOLTAGE CONTROL

Article 38

(1) The ancillary service of voltage control is provided by the following generating units and devices owned by the Service Provider:

(2) Energy-related technical characteristics of generating units and devices from the paragraph 1 hereof are provided in Addendum 6, which is an integral part hereof.

Article 39

(1) The Service Provider shall provide continuous capacities for generation and absorption of reactive energy in all generating units and devices referred to in Article 38, paragraph 1 of this Contract, which are in operation, in accordance with the technical characteristics given in the Addendum 6, which is an integral part of this Contract

(2) CGES shall register the period during which a generating unit and a device were unable to control the voltage within the limits of technical characteristics from Addendum 6 and inform the Service Provider in writing within three working days thereof.

Article 40

(1) CGES shall engage real- time resources for tertiary control purposes by issuing an order to the responsible person of the Service Provider (to the electric control operator in the plant), in form of dispatch, specifying the required voltage values or the required generation output or reactive energy absorption.

(2) The Service Provider will allow the inclusion of all of its generating units or devices into the system for automatic voltage control, which is managed by the appropriate module SCADA EMS in the National Dispatching Centre.

(3) The Service Provider will provide local equipment for automatic control, while CGES will ensure the functioning of telecommunications equipment, as well as transmission paths for transmitting signals from the NDC from generating units performing automatic voltage control.

Article 41

(1) Voltage control is an ancillary service that Service Provider provides free of charge.

(2) All funds based on overly taken reactive energy shall be divided between CGES and the Service Provider, in proportion to the participation of power plants and transmission system in the generation of total reactive energy, in accordance with the Decision.

(3) The funds from the previous paragraph shall be divided in the following ratio:

- The Service Provider receives ___% of the funds
- CGES receives ___% of funds

(4) The manner in which the funds referred to in paragraph 2 of this Article are collected is defined by the Methodology.

(5) CGES shall notify the Service Provider, in writing, of the distribution of funds referred to in paragraph 2 of this Article no later than the 7th day of the current month for the previous month.

PARTICIPATION IN RESTORATION OF ELECTRIC POWER SYSTEM

Article 42

(1) Ancillary service of black-start shall be provided by the following generating units in _____.

(2) Energy-related and technical characteristics of generating units from the paragraph 1 hereof are provided in Addendum 7, which is an integral part of this Contract.

Article 43

(1) The Service Provider shall make sure that at least one of available generating units referred to in Article 42 hereof is ready for black start when needed.

Article 44

(1) CGES shall issue the black start order in form of dispatch.

(2) The black start is carried out in accordance with the “Black-start Procedure”.

Article 45

(1) In case of activation of the service referred to in Article 42 hereof, CGES shall register:

- The time when the black start was activated and the duration of island operation until the moment of restoration of synchronization with the electric power system;
- Code of generating unit for which black start was carried out;
- Reasons for which the black start was carried out in the generating unit;
- Time when the generating unit was unable to black start within the defined technical characteristics given in the Appendix 7 hereof.

(2) CGES shall inform the Service Provider about registered data from the paragraph 1 hereof in writing within three working days from the day of data registration.

Article 46

(1) At the request of CGES, the Service Provider shall perform a self-launch test for power units.

(2) Self-launch test under paragraph 1 hereof consists of:

- Starting the generator with no presence of an external voltage
- Connecting the generator to the bus-bar system or section with no voltage present
- Energization of one of 110kV transmission lines
- Synchronization of the transmission line with the rest of the network

(3) CGES will not require more than one test during the contract period.

Article 47

(1) Participation in EPS restoration is an ancillary service that service providers provide free of charge.

PERSONNEL AUTHORIZED FOR COOPERATION

Article 48

(1) The list of responsible persons for implementation of this Contract is provided in Addendum 8.

(2) The Parties shall timely inform each other about the change of data about responsible persons.

PAYMENT OF SERVICES

Article 49

(1) Accounting period for accounting and payment of ancillary services is established as a continuous period from each 1st day of the month at 00:00 h until the 1st day of the following month at 00:00 h (monthly accounting period).

Article 50

(1) The Parties shall invoice the fees for services and other outstanding amounts under the present Contract after the expiry of the monthly accounting period, by the 15th day of the current month for the previous month.

(2) The Parties shall pay the invoiced sums by the 20th day of the current month following the accounting month.

(3) Any payment under the present Contract shall be executed according to the instructions given in the invoice.

(4) If a Party fails to fulfil its obligation within the deadline specified in paragraph 2after the expiry of such period shall pay interest on arrears pursuant to the provisions of respective laws and bylaws of Montenegro.

DISPUTE RESOLUTION

Article 51

(1) The Parties shall endeavour to solve amicably any disputes arising out of interpretation or implementation of this Contract.

(2) To this end, the Party that initiates negotiations shall submit registered letter with a confirmation of receipt to the other Party, stating the following:

1) identification references to the contract (name and date of signature);

2) subject matter of dispute and brief description of actual status;

3) date and place of meeting for the purpose of reaching an amicable agreement.

(3) If it is not possible to reach an agreement within 30 days, or within any other time agreed between the Parties, the Parties hereby agree to entrust the resolution of the issue at dispute to the Energy and Water Regulatory Agency of Montenegro.

(4) The Parties hereby agree that each of the Parties may, until the decision of the Agency referred to in paragraph 3 of this Article, withdraw from resolving the dispute with the Agency, in which case they accept the jurisdiction of the Commercial Court in Podgorica.

FINAL PROVISIONS

Article 52

(1) The Parties agree that all the articles will apply in accordance with the subject matter of the Contract except for the articles: [----------] as they are not related to the subject of the Contract.

Article 53

(1) The present Contract shall apply from ----------until----------.

Article 54

(1) If during the validity of this Contract any respective legal or sub-legal regulation is amended, the Parties shall, within the shortest time possible and by means of an annex to this Contract, harmonize corresponding provisions hereof with such amendments of laws or bylaws.

Article 55

(1) If any Article hereof becomes invalid or unenforceable, the validity of other Articles hereof shall not be affected and other provisions shall remain in force.

(2) The Parties undertake to replace such invalid or unenforceable Article with another corresponding Article within the shortest time possible.

Article 56

(1) Amendments hereof shall be made by annexes, in writing.

Article 57

(1) The Contract shall become effective on the day of its signature by the authorized representatives of the Parties.

Addendums

Article 58

The following appendices shall constitute an integral part of the present Contract .

- **Addendum. 1**: Protocol for exchange of information and data relevant for the implementation of this Contract
- **Addendum 2**: The list and energy-related technical characteristics of generating units included in the provision of primary control
- **Addendum 3**: The list and energy-related technical characteristics of generating units included in the provision of secondary control
- **Addendum 4**: The list and energy-related technical characteristics of generating units included in the provision of tertiary control
- **Addendum 5**: The list and energy-related technical characteristics of consumption units included in the provision of tertiary control
- **Addendum 6**: The list and energy-related technical characteristics of generating units included in the provision of voltage control

• **Addendum 7**: The list and energy-related technical characteristics of generating units included in the provision of black-start
• **Addendum 8**: The list of persons responsible for implementation of the Contract on the provision of ancillary services.

Article 59

(1) Amendments to data contained in the annexes shall be executed when needed, at the proposal of one of the Parties.
(2) Amended data from the Addendums 1 to 8 hereof shall be stated in the minutes signed by the authorized representatives of the Parties.
(3) The minutes from the paragraph 2 hereof shall be made in the same number of copies in which the Contract was made.

Article 60

(1) The present Contract is executed in six identical originals, of which each Party retains three originals.

Podgorica, _ *[Insert date]* _ year.

Service Provider	**Service User**
Executive Director	Executive Director
[Insert name and surname]	*[Insert name and surname]*

ADDENDUM 1: **Protocol for exchange of information and data relevant for the implementation of this Contract**

POWER RESERVE FOR__. __. _____.

ADDENDUM 2: **The list and energy-related technical characteristics of generating units included in the provision of primary control**

Power plant:_____

Generator :1 -

Technical characteristics description	value	unit
Nominal active power of generating unit		MW
Control range vs maximum power		%
Turbine controller statism range		%
Turbine controller statism – set value		%
Turbine controller zero sensitivity zone		mHz
Activation time delay		s
Activation time of full reserve		s
Frequency measurement accuracy		mHz

ADDENDUM 3: The list and energy-related technical characteristics of generating units included in the provision of secondary control

Power plant:_____

Generator: 1-

Technical characteristics of generator and local secondary control devices:

Technical characteristics description	value	unit
Nominal active power of generating unit		MW
Minimum generator power when operating in secondary control		MW
Maximum generator power when operating in secondary control		MW
Control range		MW
Load change rate		MW/s

ADDENDUM 4: **The list and energy-related technical characteristics of generating units included in the provision of tertiary control**

Power plant: _____

Technical characteristics of generator 1-

General technical characteristics	value	unit
Time to synch		min
Minimum generator power		MW
Maximum generator power		MW
Load change rate		MW/s

ADDENDUM. 5: **The list and energy-related technical characteristics of consumption units included in the provision of tertiary control**

Technical characteristics description	value	unit
Installed power		MW
Power engaged in the contract implementation period		MW
Disconnection mode		
Minimum power consumption		MW
Maximum number of activation steps		
Power of activation steps		MW
Maximum full reserve activation time		min
Maximum activation time of one step		min
Minimum blackout duration between two activations		h
Load shedding mode		
Minimum power consumption		MW
Maximum activation time		hour
Minimum blackout duration between two activations		min

ADDENDUM 6: **The list and energy-related technical characteristics of generating units included in the provision of voltage control**

Power plant:_____

Technical characteristics of generator:

Technical characteristics description	value	unit
Nominal apparent power S_n		MVA
Nominal active power P_n		MW
Nominal voltage V_n		kV
Nominal power factor		
Maximum reactive power in the over-excitation state at the nominal value of active power and nominal voltage of the generator		MVAr
Maximum reactive power in the under –excitation state at the nominal value of active power and nominal voltage of the generator		MVAr
Maximum reactive power in the under –excitation state at the nominal value of active power of 180 MW and nominal voltage of the generator		MVAr
Possibility of operation in voltage control mode in the set range (YES / NO)		
Possibility of operation in the set power factor mode (YES / NO)		
Possibility of operation in the set reactive power injection mode (YES / NO)		
Operating mode change rate after receiving the order		min

ADDENDUM 7: **The list and energy-related technical characteristics of generating units included in the provision of black-start**

Power Plant: _____

Generator:

Technical characteristics description	value	unit
Technical minimum		MW
Limitation of generator operation time in the range from 0 to Pmin		min
Power of generating units		kVA
Number of generating units		
Auxiliary power consumption (whether the power of generating unit is sufficient to cover its own consumption)		kVA
Start-up time (0 to nn)		min
Time to synch		min
Time to full load		min
Control mode (automatic / manual)		
Sync mode (automatic / manual)		
Underfrequency / overfrequency protection settings		Hz

ADDENDUM 8: **The list of persons responsible for implementation of the Contract on the provision of ancillary services**

For CGES:

Full Name	**Position**	**Phone/ Fax**	**E-mail**
for Contractual relations:			
for Operational Control:			
Billing and payment:			

For Service Provider:

Full name	**Position**	**Phone/ Fax**	**E-mail**
for Contractual relations:			
for Operational Control:			
for Billing and payment			

Appendix 3.4: Contract on purchase of electricity for coverage of transmission system losses

CONTRACT ON PURCHASE OF ELECTRICITY FOR COVERAGE OF TRANSMISSION SYSTEM LOSSES

(hereinafter referred to as: the Contract)

Between

Crnogorski elektroprenosni sistem AD, Podgorica
Bulevar Svetog Petra Cetinjskog 18
81000 Podgorica
TIN: 02751372
In capacity of Transmission System Operator
Represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter to as: **CGES**),

Berza električne energije d.o.o.

Moskovska 39
81000 Podgorica
TIN: *[Insert: TIN]*
In capacity of *[Select: type of User]*
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as **BELEN**),

and

[Insert: Name of the User]
[*Insert*: Address]
[Insert: ZIP code and city]
TIN: *[Insert: TIN]*
In capacity of *[Select: type of User]*
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as **SUPPLIER**),

or as a rule, hereinafter individually referred to as: Party or collectively referred to as: Parties

SUBJECT OF CONTRACT

Article 1

(1) Contract on delivery of electricity for coverage of losses in the transmission system (hereinafter: Contract) stipulates conditions according to which the Supplier delivers energy to CGES for coverage of losses in the transmission system while BELEN provides the service of matching electricity supply and demand in accordance with the law.

Article 2

(1) Under this Contract, Contracting parties shall specify the conditions for delivery of energy for coverage of losses in the transmission system, and in that respect also:

- Method of conducting the procurement of electricity to cover losses in the transmission system,
- Planned volumes of electricity to cover losses in the transmission system as well as delivery conditions,
- Price, calculation and invoicing procedure for delivered electricity,
- Financial guarantees
- Procedure for submission of delivery schedules and a list of responsible persons
- Cases when delivery may be terminated,
- Conditions under which a receipt of electricity may be cancelled,
- Duration of the Contract.

METHOD OF CONDUCTING THE PROCUREMENT

Article 3

(1) CGES procures electricity to cover losses in the transmission system on the stock exchange electricity market in Montenegro in a transparent procedure.

(2) BELEN in accordance with the law manages the market referred to in paragraph 1 of this Article and arranges the procurement procedure in accordance with its Rules.

CONDITIONS OF ELECTRICITY DELIVERY

Article 4

(1) The Supplier undertakes to supply electricity to CGES according to the following dynamics:

	Item 1	**Item n**
Period of delivery		
Diagram of power (MW)		

(2) The electricity delivery point from paragraph 1 herein is within the power system of Montenegro - Internal trade marked A02 or at the border - External trade marked A03 where the bidder provides 100% of cross-border capacity at the Montenegrin border.

(3) The daily delivery schedule of electricity to cover losses may be adjusted, *[Enter value%]* for each hour in relation to the diagram referred to in paragraph 1 of this Article.[14]

(4) Delivery referred to in paragraph 3 of this Article shall be made on the basis of the daily delivery schedule that CGES delivers to the Supplier to the addresses defined in Article 9 of this Contract, no later than 09:00 for the following day.

PRICE, CALCULATION AND INVOICING PROCEDURE

Article 5

(1) The contracted price of energy for coverage of transmission system losses referred to in Article 4, paragraph 1, achieved on the stock exchange market, is binding and amounts to:

	Item 1	**Item n**
Period of delivery		
Price (€/MWh)		

in accordance with long-term trade rules

Article 6

(1) Calculation of electricity for coverage of transmission system losses shall be performed on the basis of a report with a monthly sum of daily delivery schedules agreed between the Parties.

(2) Parties are obliged to harmonize the report referred to in paragraph 1 of this Article by the fifth day of the month for the previous month.

(3) In case they do not harmonize the report referred to in paragraph 1 of this Article, for the purposes of implementation of this Contract, the Parties shall use the monthly report prepared by CGES.

(4) The Supplier shall calculate and invoice the energy delivered for coverage of transmission system losses no later than three working days following the confirmation of the volumes from paragraph 1 herein.

Article 7

(1) CGES undertakes to pay the invoiced amount within fifteen days from the day of receipt of invoice.

(2) In case of delay in payment of fees from paragraph 1 herein, CGES is obliged to pay a default interest to the Supplier in accordance with the law.

(3) Delivery of the report, its harmonization referred to in Article 6 and invoices shall be done by e-mail, from the addresses defined in Article 9 of this Contract.

[14] In case it has been defined by CGES call

CONTRACT PERFORMANCE GUARANTEE SUBMISSION OBLIGATION

Article 8

(1) The Supplier is obliged to submit a Bank Guarantee in the amount of _____, as a Contract Performance Guarantee, no later than the day of signing this Contract.

(2) The guarantee referred to in paragraph 1 of this Article must be unconditional and payable on first demand with a validity period of 30 days after the completion of delivery within the specified period referred to in Article 4 paragraph 1 of this Contract.

AUTHORIZED PERSONS

Article 9

(1) The list of responsible persons for implementation of this Contract is given in Addendum 1.

(2) The Parties undertake to inform timely in writing each other on change of information about authorized persons.

CASES OF FORCE MAJEURE, DELIVERY SUSPENSION AND CALCULATION OF CONTRACT TERMINATION FEE

Article 10

(1) Force Majeure, as defined under this Contract, shall be understood as an unplanned natural event having a character of natural disasters (floods, earthquakes, fires, atmosphere discharges, strong winds, excessive ice, sea salt deposits etc.), as well as failures on devices and installations that did not happen as a result of fault of the Party that refers to the effects of Force Majeure, and which are beyond the effective control of the Party invoking the Force Majeure, which it reasonably could not avoid or overcome and which makes it impossible for the Party invoking the Force Majeure to fulfil its obligation to deliver or take over, including, inter alia, occurrence of one or more of the following events:

1) Failure of the communication or computer system of the transmission system operator (s) concerned, which prevents the Party invoking the Force Majeure from fulfilling its delivery or takeover obligations; or

2) Delay in delivery or taking over or non-consideration of the obligations of the Contracting Party invoking the Force Majeure with regard to the delivery under the Contract.

(2) If one of the Party is fully or partially prevented by Force Majeure from fulfilling its obligations to deliver or receive electricity under this Contract and in all respects complies with the requirements of this Contract, it shall be deemed that there has been no breach of obligations or non-performance by the Party and it shall also be relieved (and not merely suspended) of these obligations for a period of time and to the extent that such Force Majeure prevents its performance. That Party shall have no obligation to pay damages in respect of those electricity volumes not delivered or received. In the event and to the extent that one Party is released from the obligation to deliver or receive electricity due to Force

Majeure, the other Party shall also be released from the corresponding obligations to receive and pay, i.e. to deliver electricity.

(3) The Party that refers to the effects of Force Majeure is obliged to notify without delay within three working days the other Contracting party thereof in writing, indicating the character and beginning of the effect of Force Majeure. The same notification procedure shall be applicable in case of notification about termination of effects of Force Majeure.

(4) The Party that refers to the effects of Force Majeure proves the same upon request of the other party, but the procedure of proving shall not anyhow disturb further implementation of the Contract.

Article 11

(1) In case the Supplier fails to deliver all or part of the energy that it should supply according to this Contract, and in case there were no interruptions caused by Force Majeure, the Supplier shall compensate to CGES the cost incurred as a consequence of procurement of undelivered energy volumes from the balance mechanism as well as other eligible and provable costs and expenses incurred by CGES as a result of non-performance of the Supplier, in the amount equal to the product of :

1) the amount (if positive) for which the Contracted Price exceeds the price at which CGES can or could procure that amount of undelivered electricity on the market, acting in accordance with the law and

2) volumes of undelivered electricity.

(2) In case CGES fails or refuses to take over the delivery (at the timely agreed place of delivery) of the total or part of energy delivered according to this contract, and in case there were no interruptions caused by Force Majeure, CGES shall compensate to the Supplier damage for uncollected electricity volumes in an amount equal to the product:

1) the amount (if positive) for which the Contracted Price exceeds the price at which the Supplier can or could sell that amount of uncollected electricity on the market, acting in a commercially justified manner,

2) volumes of undelivered electricity.

(3) The amount obtained referred to in paragraph 2 of this Article shall be increased by additional transmission costs (CBTC) and other eligible and provable costs and expenses incurred by the Supplier as a result of non-performance of CGES.

TERMINATION AND CALCULATION OF CONTRACT TERMINATION FEE

Article 13

(1) Until the Contract is completed, the same may be terminated for justified reasons, or by mutual consent of the Party. Justified reasons include the following:

1) the due amount has not been paid within 3 (three) working days from the day of receipt of the letter in which the procuring Party warns that this case may lead to the termination of the Contract;

2) failure of the Party to fulfil the obligations of delivery/receipt of electricity under this Contract (unless it is relieved of such obligations under Article 10 of this Contract) for a period of 5 (five) calendar days;

3) if a request for initiating insolvency /bankruptcy proceedings has been submitted towards the other Party;

4) force majeure lasting more than 30 (thirty) calendar days.

(2) If the material reasons described in paragraph 1 of this Article have occurred and continue, the Party that is not in default may terminate this Contract with prior written notice to the other Party. This notice shall contain all relevant material reasons for the termination of the Contract and the date of termination of the Contract.

(3) In case of termination of the Contract, the Parties shall not have any obligations to perform the delivery /receipt of electricity after the effective date of termination of the Contract. The delivery of electricity realized before the date of termination of the Contract shall be paid.

(4) If the circumstances referred to in paragraph 1 of this Article have occurred, the Party that terminated the Contract shall calculate the amount ("Termination Fee") according to Article 11 of this Contract.

Assigning on the part of the Supplier

Article 13

(1) The Parties agree that the Supplier may deliver energy by assigning physical delivery of the contracted energy on its behalf and for its account to the related companies within the Supplier (hereinafter: the Assignee), only in case of delivery in all respects according to the agreed conditions of procurement and delivery under this Contract, thereby the assignee by physical delivery fulfils the obligation of the Supplier in all according to the conditions of this Contract.

(2) The delivery by the Assignee is the delivery of the Supplier in all respects according to this Contract and the Supplier shall be responsible for the correctness of the fulfilment of the obligations of the Assignee. The Parties agree that the Supplier, as a Party, will calculate the electricity delivered by the Assignee.

(3) CGES accepts delivery through the Assignee as delivery by the Supplier only in case when delivery is made in all respects according to the agreed conditions, and all members of this Contract refer to it as direct delivery of the Supplier.

TAXES AND EXPENSES

Article 14

(1) The Supplier is obliged to cover all taxes, liabilities and all other expenses related to production of import of energy in Montenegro.

FINAL PROVISIONS

Dispute resolution

Article 15

(1) The Parties shall endeavour to solve amicably any disputes arising out of interpretation or implementation of this Contract.

(2) To this end, the Party that initiates negotiations shall submit registered letter with a confirmation of receipt to the other Party, stating the following:

1) identification references to the contract (name and date of signature);

2) subject matter of dispute and brief description of actual status;

3) date and place of meeting for the purpose of reaching an amicable agreement.

(3) If it is not possible to reach an agreement within 30 days, or within any other time agreed between the Parties, the Parties hereby agree to entrust the resolution of the issue at dispute to the Energy and Water Regulatory Agency of Montenegro.

(4) The Parties hereby agree that each of the Parties may, until the decision of the Agency referred to in paragraph 3 of this Article, withdraw from resolving the dispute with the Agency, in which case they accept the jurisdiction of the Commercial Court in Podgorica.

Article 16

(1) This Contract shall enter into force on a day of its signing by the Contracting parties, and shall be implemented from _____ to_____.

Article 17

(1) The Contract is executed in six identical originals, of which each Party keeps two originals.

In Podgorica, _*[Insert date]* _ year.

CGES
Executive Director

[Insert name and surname]

Supplier
Executive Director

[Insert name and surname]

BELEN
Executive Director

[Insert name and surname]

Addendum 1: List of persons responsible for contract implementation

Reconciliation of daily schedule for delivery:

CGES	

Billing and payment

CGES	

Contract implementation

CGES	

Appendix 3.5: Contract on assigning right to access cross-border transmission capacities

CONTRACT ON ASSIGNING RIGHT TO ACCESS CROSS-BORDER TRANSMISSION CAPACITIES

(hereinafter referred to as: the Contract)

Between

Crnogorski elektroprenosni sistem AD, Podgorica
Bulevar Svetog Petra Cetinjskog 18
81000 Podgorica
TIN: 02751372
In capacity of Transmission System Operator
Represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter to as: **CGES**),

and

[Insert: Name of the User]
[*Insert*: User address]
[Insert: ZIP code and city]
TIN: *[Insert: TIN]*
In capacity of *[Select: type of User]*
represented by: Executive Director, *[Insert: Name and surname]*
(hereinafter referred to as **User**),

Article 1

(1) With the Contract herein CGES and User regulate the User's right to access to the transmission network with the aim of using cross-border capacity, obtained in the allocating procedure (auction) organized by CGES.

Article 2

(2) CGES approves to the User the access to the transmission network with the aim of using cross-bored capacity in the following manner:

- TABLE
- Border:
- Direction:
- Period of validity:
- Diagram:
- Price of allocated transmission capacity:
- Allocating capacity code (CBCcID):

Article 3

(1) CGES reserves the right, in case of unforeseen perturbations in the electric power system decreases or terminates the right of cross-border transmission from the previous Article.

In this case, the User shall be refunded the funds from the transmission capacity allocation that arises from introduced limitations.

(2) CGES does not take responsibility for damage occurred due to decrease or termination of the approved electricity transmission carried out due to unforeseen circumstances.

Article 4

(1) CGES shall perform calculation of for rendered service pursuant to the “Rules for allocation of available transmission capacities and submit a relevant invoice to the User.

(2) Payment by the User will be made to the CGES's bank account indicated in the invoice.

Article 5

(1) The User is obliged to pay the invoiced amount no later than 5 days from the delivery of the invoice from Article 4 of the Contract.

(2) If the User does not settle its payment obligation pursuant to the previous paragraph, CGES shall calculate a statutory default interest.

(3) If the User does not settle its payment herein, CGES keeps the right to terminate User’s rights to the allocated capacity, as also the ban on participation of the User to future auctions.

Article 6

(1) The user is obliged to deliver for all payments a specification of obligations it settles according to the maturity of the invoice, and if the User does not deliver it, it agrees that CGES shall make such specification according to deadlines of the maturity of obligations.

Article 7

(1) The Parties are obliged to respect fully the “Rules for allocation of available transmission capacities on interconnection links of the control area Montenegro with the neighbouring control areas”.

Article 8

(1) Any dispute arising out of the Contract the Parties shall settled by mutual consent.

(2) If the occurred dispute cannot be solved by mutual consent, that dispute shall be referred to the Commercial Court in Podgorica

In Podgorica, _*[Insert date]* _ year.

CGES	**User**
Executive Director	Executive Director
[Insert name and surname]	*[Insert name and surname]*

Appendix 3.6: Registration form for participation in daily auctions on the border Montenegro – _____

Company/entrepreneur name	
Address, country	
Number from the Registry of Commercial Entities	
Name and surname of representative	
VAT number	
ID number/TIN	
Email	
Telephone number	
Fax number	
EIC code for identification of Auction Participant	

By submitting this registration form with a valid signature, the company/entrepreneur identified based on the table above (hereinafter referred to as *Auction Participant*) declares that it is fully familiar with the applicable *Auction Rules for the Allocation of Transmission Capacity* (hereinafter: *Auction Rules*), which are published on the website of the *Auction House* (*CGES*) on the day of signing and that it legally and irrevocably accepts them.
The *Auction Participant* also legally and irrevocably declares that it accepts possible amendments to the Auction Rules.
The *Auction Participant* also states that it represents an entrepreneur or a company established by law, that he is not subject to insolvency proceeding or bankruptcy and that no court or other proceeding is conducted against him that could jeopardise the fulfilment of the conditions specified in the *Auction Rules*.
The *Auction Participant* also declares that there are no outstanding debts to *CGES* and *[Insert the name of transmission system operation]*.
By confirming the registration form, a *Contract* between *the Auction House (CGES)* and the *Auction Participant* for auctions on the border Montenegro - *[Enter border]* is signed. The *Auction Rules* are the general conditions of the *Contract*. The *Auction House (CGES)* has registered the *Auction Participant* by confirming the registration form.
This statement is valid for an unlimited number of *Auctions*, notwithstanding the obligation of the *Auction Participant* to immediately notify the *Auction House* (CGES) of any changes, and notwithstanding the right of the *Auction House (CGES)* to request renewal of this statement.
The *Auction Participant* declares that the registration form and its appendices contain complete and true information.
This registration form is made in 3 (three) identical copies, of which 2 (two) are for the *Auction House (CGES)* and 1 (one) for the *Auction Participant*.
The *Auction Participant* declares that the registration form and appendices contain complete and true information.

Addendums:

1. List of authorised representatives who have the right to communicate with the *Auction House (CGES)* and give statements to the *Auction House (CGES)* which are binding for the *Auction Participant*
2. Original or certified copy of an excerpt from the competent register related to the registration of the *Auction Participant* from the country of the company's headquarters (in Montenegrin or one of the languages in official use in Montenegro, or in English)

On behalf of the *Auction Participant*

Date: _____ _____
Signature

Crnogorski elektroprenosni sistem AD Podgorica as the *Auction House* approves the registration form and registers the concluded *Contract* between *CGES* and the *Auction Participant* under the registration number: _____

On behalf of *CGES*

Date: _____ _____
Signature

Addendum 1: **List of authorised representatives of the *Auction Participant***

The *Auction Participant* appoints the following persons as authorised to act on behalf of the *Auction Participant:*

- for signing the Contract

Name and surname	**Telephone number**	**Mobile phone number**	**Fax number**	**Email**

- for signing the Statement on the Takeover and Use of Cross-Border Transmission Capacities

Name and surname	**Telephone number**	**Mobile phone number**	**Fax number**	**Email**

- for submitting bids to the *Auction House*

Name and surname	**Telephone number**	**Mobile phone number**	**Fax number**	**Email**

- for financial issues

Name and surname	**Telephone number**	**Mobile phone number**	**Fax number**	**Email**

Company/entrepreneur address **(fill in if the address changes)**	

The *Auction Participant* declares that each *User* will be trained and instructed in accordance with the *Auction Rules*.

The *Auction Participant* undertakes to immediately notify the *Auction House* of any changes to the information in this form.

Date

On behalf of the *Auction Participant*

_____

Signature

APPENDIX 4: General requirements in terms of frequency

Consumers

Frequency ranges	Duration
47.5 Hz – 48.5 Hz	Not less than 30 minutes
48.5 Hz – 49.0 Hz	Not less than 30 minutes
49.0 Hz – 51.0 Hz	Unlimited
51.0 Hz – 51.5 Hz	Not less than 30 minutes

Table 1 – the shortest periods during which a consumer plant connected to the transmission system, a distribution plant connected to the transmission or distribution system should be capable to operate at different frequencies that deviate from the nominal value, without being disconnected from the network.

Generating units

Frequency ranges	Duration
47.5 Hz – 48.5 Hz	Not less than 60 minutes
48.5 Hz – 49.0 Hz	Not less than 60 minutes
49.0 Hz – 51.0 Hz	Unlimited
51.0 Hz – 51.5 Hz	Not less than 30 minutes

Table 2 – the shortest periods during which a generating unit should be capable to operate at different frequencies that deviate from the reference value, without being disconnected from the network.

High-voltage direct current (HVDC) systems

Frequency ranges	Duration
47.0 Hz – 47.5 Hz	60 seconds
47.5 Hz – 48.5 Hz	Not less than 120 minutes
48.5 Hz – 49.0 Hz	Not less than 120 minutes
49.0 Hz – 51.0 Hz	Unlimited
51.0 Hz – 51.5 Hz	Not less than 120 minutes
51.5 Hz – 52.0 Hz	Not less than 30 minutes

Table 3 – the shortest periods during which a HVDC system should be capable to operate at different frequencies that deviate from the nominal value, without being disconnected from the network.

Electric power park modules connected through direct current

Frequency ranges	Duration
47.0 Hz – 47.5 Hz	Not less than 20 seconds
47.5 Hz – 49.0 Hz	Not less than 90 minutes
49.0 Hz – 51.0 Hz	Unlimited
51.0 Hz – 51.5 Hz	Not less than 90 minutes
51.5 Hz – 52.0 Hz	Not less than 15 minutes

Table 4 – the shortest periods for a system with the nominal frequency of 50 Hz during which an electric power park module should be capable to operate at different frequencies that deviate from this nominal value, without being disconnected from the network.

APPENDIX 5: General requirements in terms of voltage

Consumers

Distribution systems connected to the transmission system of voltage lower than 110 kV at the connection point; the competent TSO should determine the voltage range at the connection point for whose maintenance the distribution systems connected to the transmission system must be projected. DSOs should project the capabilities of equipment connected to the transmission system with a voltage equal to the voltage at the connection point, in order to comply with that voltage range.

Voltage range	Duration
0.90 pu – 1.118 pu	Unlimited
1.118 pu – 1.15 pu	60 minutes

Table 1 – the shortest periods during which a consumer plant connected to the transmission system, a distribution plant connected to the transmission system or a distribution system connected to the transmission system should be capable to operate at voltages that deviate from the reference voltage value of 1 pu at the connection point, without being disconnected from the network, when the when the base voltage for the values of pu is in the range from at least 110 kV up to (not including) 300 kV.

Voltage range	Duration
0.90 pu – 1.05 pu	Unlimited
1.05 pu – 1.10 pu	60 minutes

Table 2 – the shortest periods during which a consumer plant connected to the transmission system, a distribution plant connected to the transmission system or a distribution system connected to the transmission system should be capable to operate at voltages that deviate from the reference voltage value of 1 pu at the connection point, without being disconnected from the network, when the base voltage for the values of pu is in the range from at least 300 kV up to (including) 500 kV.

Generating unit

Voltage range	Operation period
0.85 pu – 0.90 pu	60 minutes
0.90 pu – 1.118 pu	Unlimited
1.118 pu – 1.15 pu	60 minutes

Table 3 – the shortest periods during which a generating unit must be capable to operate at voltages that deviate from the reference voltage value of 1 pu at the connection point, without being disconnected from the network, when the base voltage for the values of pu is in the range from 110 kV up to 300 kV.

Voltage range	Operation period
0.85 pu – 0.90 pu	60 minutes
0.90 pu – 1.05 pu	Unlimited
1.05 pu – 1.10 pu	60 minutes

Table 4 **–** the shortest periods during which a generating unit must be capable to operate at voltages that deviate from the reference voltage value of 1 pu at the connection point, without being disconnected from the network, when the base voltage for the values of pu is in the range from 300 kV up to 400 kV.

High-voltage direct current (HVDC) systems

Voltage range	Operation period
0.85 pu – 1.118 pu	Unlimited
1.118 pu – 1.15 pu	60 minutes

Table 5 – the shortest periods during which a HVDC system should be capable to operate at different voltages that deviate from the reference value of 1 pu at the connection point, without being disconnected from the network. This table shall be applied for base voltage values in pu at or above 110 kV up to (but not including) 300 kV.

Voltage range	Operation period
0.85 pu – 1.05 pu	Unlimited
1.05 pu – 1.0875 pu	120 minutes
1.0875 pu – 1.10 pu	60 minutes

Table 6 – the shortest periods during which a HVDC system should be capable to operate at different voltages that deviate from the reference value of 1 pu at the connection point, without being disconnected from the network. This table shall be applied for base voltage values in pu from 300 kV up to 400 kV (including these values).

Electric power park modules connected through direct current

Voltage range	Operation period
0.85 pu – 0.90 pu	60 minutes
0.90 pu – 1.10 pu	Unlimited
1.10 pu – 1.118 pu	Unlimited
1.118 pu – 1.15 pu	120 minutes

Table 7 – the shortest periods during which an EPP module connected through direct current should be capable to operate at different voltages that deviate from the reference value of 1 pu, without being disconnected from the network, if the base voltage for the values of pu is in the range from at least 110 kV up to (not including) 300 kV.

Voltage range	Operation period
0.85 pu – 0.90 pu	60 minutes
0.90 pu – 1.05 pu	Unlimited
1.05 pu – 1.15 pu	120 minutes

Table 8 – the shortest periods during which an EPP module connected through direct current should be capable to operate at different voltages that deviate from the nominal value, without being disconnected from the network, if the base voltage for the values of pu is in the range from at least 300 kV up to 400 kV (including those values).