GRENADA ELECTRICITY SECTOR GRID CODE

TRANSMISSION & DISTRIBUTION CODE

2026

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TDC 1. INTRODUCTION TO THE CODE

TDC 1.1 INTRODUCTION

The Transmission and Distribution Code (this Code, TDC) applies to both the Transmission System (33kV or higher voltage) and the Distribution System. The Distribution System covers the power system equipment from the outgoing isolators on the Transmission Substations to Customers' Service Point of Supply Delivery and small distributed generation

This sub code of the Grid Code governs the terms and conditions controlling the development, operation, and maintenance of Grenada electricity Transmission and Distribution System ("System") by the Network Licensee, as well as the conditions for interconnection to the System-by-System Users.

This TDC should be read together with the Generation Code (GC) of the Grid Code, in particular conditions and requirements for connection, technical and performance standards for generation.

The main purpose of the Transmission and Distribution Code is to provide an efficient, coordinated, and economic System with non-discriminatory access by all System Users.

TDC 1.2 SCOPE

This Transmission and Distribution Code establishes the roles, rights and responsibilities of the Network Licensee and System Users related to transmission and distribution and sets out the procedures and principles governing the development, planning, maintenance, and operation of the Grenada electricity System and connections.

The Network Licensee, all System Users currently connected to the Transmission and Distribution System, and all applicants seeking to connect to the Transmission and Distribution System must comply with this Code.

TDC 1.3 STRUCTURE OF THE TRANSMISSION AND DISTRIBUTION CODE

The Transmission and Distribution Code consists of 18 sections, as follows:

Section 1	Introduction to the Code
Section 2	General Requirements
Section 3	Transmission and Distribution Planning
Section 4	Maintenance Standards
Section 5	Transmission and Distribution System Interconnection
Section 6	Power Quality Standards
Section 7	Plant and Apparatus Relating to Interconnection Sites
Section 8	Generation Facility Site Related Conditions
Section 9	Operational Communications

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Section 10	Demand Control
Section 11	System Control
Section 12	Contingency Planning
Section 13	Incident Information Supply
Section 14	Communication and Control
Section 15	Numbering and Nomenclature of Apparatus
Section 16	Testing, Monitoring and Investigation
Section 17	Transmission and Distribution Metering
Section 18	Transmission and Distribution System Data Registration

TDC 2. GENERAL REQUIREMENTS

This Transmission and Distribution Code contains the procedures to provide an adequate, safe and efficient System service to all parts of Grenada, taking into account a wide range of operational circumstances. In implementing the Code, including any circumstances not expressly anticipated by the Code, the Network Licensee shall act as a reasonable and prudent operator to achieve the following general requirements:

(i.) Protection of the safety of the public and employees.
(ii.) Prevention of damage to the System.
(iii.) Management of the System in a prudent and efficient manner to secure the preservation of the integrity, reliability, security and safety of the System.
(iv.) Treatment of all Generators in a consistent and non-discriminatory manner.
(v.) Compliance with conditions under its License; and
(vi.) Compliance with the Grid Code.

System Users shall provide reasonable co-operation and assistance in implementing this Code and respond to reasonable requests of the Network Licensee to achieve these general requirements.

TDC 3. TRANSMISSION AND DISTRIBUTION PLANNING

TDC 3.1 PURPOSE AND SCOPE

The Network Licensee shall be responsible for planning the development of the Transmission and Distribution System (the System). Planning includes but is not limited to:

(i.) Collection of data from electricity sector participants and System Users;
(ii.) Consultations with the Ministry, the Commission, and other electricity sector institutions and stakeholders; and
(iii.) Conduct of Load forecast and other planning or analysis required of the Network Licensee by the Ac, this TDC or related implementing regulations.

The planning process for transmission and distribution shall take into consideration the requirements of the Act, the guidance of any National Electricity Strategy approved by the Minister under Section 10 of the Act or any other Cabinet policy applicable to the development of the electricity sector, any integrated resource plan (IRP) approved by

the Commission, or any other Commission approved program. All license and permit holders, and all other System Users, must comply with any reasonable information request made by the Network Licensee for the purposes of executing its planning responsibility under this TDC 3. Failure of a System User to comply in full with such an information request without reasonable cause shall be a violation of the Grid Code, and the Network Licensee will have the right to complete the missing data with its estimates or assumptions based on available relevant information.

TDC 3.2 PLANNING PROCESS

TDC 3.2.1 INTRODUCTION

The Transmission and Distribution Code anticipates a three-phase process for Grid planning: long-term, mid-term, and near-term operational planning.

The Network Licensee is responsible for long-term, mid-term, and near-term (operational) System planning, subject to oversight of the Commission, including:

(i.) Assuring that all three phases of planning are consistent with the goals identified in any National Electricity Strategy approved by the Minister under Section 10 of the Act, or other energy policies approved, and the planning requirements defined in TDC 3.1;
(ii.) Covering the scope established in Section 37 of the Act;
(iii.) Forecasting the future demand on the System;
(iv.) Analysing the impact of the connection of new facilities such as Generating Units connected to the System, loads, distribution lines, or substations;
(v.) Planning the expansion of the Transmission and Distribution System to ensure its adequacy to meet forecast Demand and the connection of new Generation and loads, and coordinating with System Users to obtain necessary planning data;
(vi.) Identifying problems addressing compliance with standards on Reliability of Supply, Power Quality and System Losses in the Transmission and Distribution System; and
(vii.) Developing and updating of the draft System Expansion studies required in the Act and Integrated Resource Plan required in regulations, for review and approval by the Commission.

TDC 3.2.2 LONG TERM PLANNING

TDC 3.2.2.1 Long-Term Planning (System Expansion Studies and Integrated Resource Planning)

Long term planning involves the Network Licensee to develop (i) System expansion studies and plans for integration of renewable energy projects under the Act Section 37 and this Code, and to support any development of a National Electricity Strategy by the Ministry under Section 6 of the Act; and (ii) proposed Integrated Resource Planning (IRP) as required in the Electricity (Generation Expansion Planning and Competitive Procurement) Regulations.

The Commission may request the Grid Code Review Committee to prioritize

development of detailed Long-Term Planning provisions or procedures pertaining to data collection and reporting for long term planning, consistent with the requirements and process in this TDC 3.2, the Act and approved relevant regulations.

Before the end of each year, the Network Licensee will provide the Commission with a schedule of studies planned for the next year. However, for the first implementation of the plans and studies established in TDC3.2., the Commission and the Network Licensee will agree for a staggered approach to the development and approval of plans and studies.

TDC 3.2.2.2 Integrated Resource Planning

At least every five (5) years or when requested by notice of the Commission, the Network License shall prepare an IRP proposal based on the guidance, horizon of the IRP, timetable, content and other relevant information provided in the notice of the Commission.

The Integrated Resource Planning process will require a coordinated data collection system and software requirements among the Ministry, the Commission, the Network Licensee, and all IPPs and Permit holders, to best support the planning process and to minimize any inefficiencies.

In preparing and submitting the IRP proposal to the Commission for approval, the Network Licensee shall follow the process and take into consideration the scope and conditions established in Schedule 6 of the Electricity (Generation Expansion Planning and Competitive Procurement) Regulations.

For the IRP horizon, the Network Licensee shall develop and propose demand, generation, energy storage, and transmission and distribution scenarios

The Network Licensee shall obtain Commission approval for the protocols to control any load forecasting projection studies or other technical studies that will inform the Integrated Resource Plan process before implementing the studies and shall provide the final studies to the Commission.

The Network Licensee shall provide details on any technologies anticipated by the Integrated Resource Planning study to be used for supply, interconnection, storage, or other purposes modelled within the study and feasibility studies used to determine viable technologies.

The Network Licensee may be supported and advised by external experts or consultants in the preparation of the IRP, including analysis, projections and studies related to grid stability, reserves and storage, and renewable resources potential projects.

TDC 3.2.2.3 Expansion P*lanning* Studies P*rocess*

At least once every [three (3)] years or when necessary, the Network Licensee shall develop draft System Expansion studies for review and approval by the Commission which shall include:

(i.) Energy and Demand Forecasts, and impact of energy efficiency initiatives and self-generation;

(ii.) Transmission and Distribution conductor routing and sizing;

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(iii.) Transmission and Distribution Reactive Power compensation plan and any energy storage for System operational requirements and integration of renewables;
(iv.) Transmission and Distribution Losses reduction plan;
(v.) Other Transmission and Distribution reinforcement plans;
(iv.) A Least Cost Expansion Plan to meet the energy and demand forecast, Distribution and Transmission System investment plans including energy storage, identifying new generation for demand growth or to replace existing power generation from fossil fuels by more efficient generation or renewable energy resources generation.
(v.) Assessment of modern technologies with emergent opportunities for improved electricity system operations and cost savings; and
(vi.) Summary of the technical and economic analyses performed to justify the System Least Cost Expansion Plan.

The process will involve, among others, data collection, specialized software and organised data bases, consultation, preparation and submission of final report to the Commission for review and approval.

The Network Licensee shall propose a timeline and process to the Commission for development of the draft System Expansion Studies using a collaborative and consultative process designed to engage System Users and other key stakeholders in the electricity sector. The Commission shall approve the process prior to commencement, and shall oversee the process, providing comments to the drafts submitted by the Network Licensee to inform progress in the studies. The timeline proposed by the Network Licensee will include the timing of progress reports, and the final report.

The Network Licensee shall comply with best utility practice in System Expansion planning to assure alignment with Grenada's energy policies and laws, as well as best international practices in Grid Development. While led by the Network Licensee, the expansion studies development process must be collaborative and inclusive of System Users and other relevant stakeholders, and require best available data from System Users and System forecasts and analysis, and remains subject to oversight of the Commission.

Data collection procedures will be discussed and agreed to list the scope and coordinate the information to be provided by the Minister to the Network Licensee, copied to the Commission. If at the time of initiating the studies some of the information has not been received, the Network Licensee will use the best available assumptions taking into consideration energy policies, and an approved IRP.

The report with results of the studies will identify the information provided and the data that has been estimated or assumed by the Network Licensee, with the corresponding justification.

The Commission shall approve the final Expansion Studies and Least Cost Expansion Plan and shall refer to the Plan as relevant in any review of the Network Licensee's mid-term and short-term plans, and in any Network Licensee tariff applications consistent with applicable regulations. Once approved, the Network Licensee will publish the System Expansion Planning Studies on its website.

TDC 3.2.3 MID-TERM PLANNING

The Network Licensee is responsible for mid-term planning in compliance with the requirements of the Grid Code, including the Generation Code. the policy objectives set forth in an approved integrated resource plan, and the approved System Expansion studies. The Mid-Term Plan shall inform and be consistent with the rolling five (5) year sustainability programme to be developed under the Act.

The horizon of the mid-term planning process will be up to three (3) years looking forward (next calendar year and up to next 2 calendar years), consistent with the three-year horizon for generation maintenance planning required in the Generation Code. The Network Licensee shall review and update the demand forecast for a three (3) year horizon, the progress in the implementation of the Transmission and Distribution approved investments, and investment in new generation, including self-generation.

Mid-term planning by the Network Licensee will also include maintenance planning of the Transmission and Distribution System in accordance with TDC 10.6 and the coordination with generators to develop the "Generator Maintenance Program" in accordance with GC 8. The overall maintenance plan, combining the transmission and distribution maintenance plans with the generation maintenance plan, shall be prepared for a rolling three (3) year horizon, reviewed and updated before the start of year calendar year. In reviewing and coordinating the maintenance plans, the Network Licensee will assess the impact of maintenance outages in reliability and continuity of supply.

System Users and potential new system users (applicants) shall collaborate with medium term planning by providing the Network Licensee all required data, in particular planning data and data for registration as defined in this Code.

TDC 3.2.4 NEAR-TERM (OPERATIONAL) PLANNING

The Network Licensee is responsible for operational planning in compliance with the requirements of the Grid Code and the policy objectives set forth in an approved Integrated Resource Plan, and the approved System Expansion studies. The Near-Term (Operational) Plan shall inform and be consistent with annual sustainability programme to be developed under Section 37 of the Act, and take as initial inputs the data collected and results of the latest mid-term planning.

The horizon of the operational (near term) planning will be up to 12 months ahead (rolling 12 months basis). The Network Licensee shall review and update the monthly and weekly demand forecast and carry out the operational System studies to identify any limits to distribution or transmission lines capacity (flows) to ensure compliance with system security, quality and reliability standards defined in the Grid Code.

Near term operational planning by the Network Licensee will include updating maintenance plans for the next 12 months of the Transmission and Distribution System in accordance with TDC 10.6 and of generation in accordance with GC 8, to define the schedule of planned maintenance outages, on a weekly or daily basis. In reviewing and coordinating the maintenance plans, the Network Licensee will assess the impact of maintenance outages in reliability and continuity of supply.

The near-term planning will be updated on a week ahead and day ahead basis to carry out generation scheduling and dispatch in accordance with process and requirements in

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System Users shall collaborate with medium term planning by providing all required data, in particular demand, generation dispatch and availability data, generation forecasts by renewables and update or modification of maintenance outages.

TDC 3.3 INFORMATION COLLECTION/ANALYSIS

The planning processes described in TDC 3.2, "PLANNING PROCESS" shall be an ongoing series of planning and updates. The Network Licensee, after consultation with the Grid Code Review Committee and with stakeholders in any Integrated Resource Plan process, shall develop information collection procedures to support the Long-Term, Mid-Term, and Near-Term (Operational) planning processes and propose to the Commission for approval. Once approved, the procedures will be published in the website of the Network Licensee and be considered as implementation procedures of the Grid Code.

Interconnection-related planning studies will be undertaken outside the above process, but new load information will be used to inform the demand forecasts. The timescales required to undertake the new interconnection studies necessary to plan the System vary depending on the driver for the studies and the ability to obtain consented routes and are controlled by the Interconnection requirements of this Transmission and Distribution Code.

TDC 3.4 TRANSMISSION AND DISTRIBUTION SYSTEM SECURITY STANDARDS

In all planning, the Network Licensee shall use a N-1 security criterion as general planning guidance where it is currently feasible and the overall network should be planned for in the longer term to achieve N-1 security as assessed on an annual basis, unless the Commission establishes an alternative standard. The phasing of N-1 standard to the parts of the overall network where it still does not exist will be proposed by the Network Licensee for PURC review and approval, taking into consideration logistics and to smooth the impact on tariffs of new network investments.

TDC 3.4.1 NORMAL CONDITIONS

The Network Licensee shall plan, design and operate the Transmission and Distribution System such that under normal steady state conditions, prior to any fault, there shall not be:

(i.) Equipment loadings exceeding their pre-fault ratings;
(ii.) Voltages above 4% or lower than -8% of nominal values as measured at the Customer's Service Point of Supply Delivery;
(iii.) Voltages above 3% or lower than -3%[1] of nominal values on Generator buses; or

[1] The values used here should be in compliance with the ESA which stipulates +3% and -3%

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(iv.) System Frequencies above 0.5% or lower than -0.5% of nominal (50Hz);

TDC 3.4.2 CONTINGENCY CONDITIONS

The Network Licensee shall plan, design and operate the Transmission and Distribution System such that under a single contingency condition, prior to any fault, there shall not be Voltages above 8% or lower than 10% of nominal values on 33 kV buses.

The Network Licensee shall plan, design and operate the Transmission and Distribution System seeking that the System is secured against the contingency of a Single Forced Outage, except parts where the System is radial. The Network Licensee shall assure that the loss of any single transmission element or inter-bus transformer, except in cases of radial lines, shall not affect the System's ability to adequately supply the required demand of its substation(s).

TDC 3.5 LOAD POWER FACTOR

The System will be planned for a normal load power factor of 95% lagging.

TDC 3.6 THERMAL LOADINGS

Under contingency conditions, transmission line loading of up to 110% of rated continuous rating for thirty (30) minutes (Emergency Rating) may be used. Inter-bus transformer loadings may not exceed nominal rating.

TDC 3.7 FAULT LEVELS

TDC 3.7.1 GUIDING PRINCIPLES

The entire System protection concept and the adjustment values for electrical protection devices must be agreed between the Network Licensee and Generation Licensees and Self-Generator Permit Holders. The guiding principle is that the System maximum fault levels shall be below 80% of the rated interrupting capacity of circuit breakers and other protective devices for each Generating Unit and on all Transmission and Distribution lines. These fault levels are to be determined in light of each Generating Unit's transient impedances.

TDC 3.7.2 INTERCONNECTION AGREEMENT/PPA PROVISIONS

The fault level requirements for all Generators connected to the Grid shall be addressed in the Interconnection Agreement and/or PPA if the PPA is drafted to also cover the scope required for the Interconnection Agreement. Small Renewable Energy Self-Generators will be responsible for conforming to the electrical protection standards set in the Code of Practice for Small Renewable Energy Generation Facilities, consistent with the provisions of GC 3.11, "Protection Requirements" and GC 3.15, "Short Circuit Levels."

TDC 3.8 FREQUENCY CRITERIA

The Network Licensee shall supply power at a nominal frequency of 50 Hz within a nominal operation band of ± 0.5% as stated in TDC 3.4.1 "Normal Conditions."

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TDC 3.9 NETWORK STABILITY

The Network Licensee is responsible for performing all necessary Transmission and Distribution studies to determine the safe operating limits that will protect the System against any instability problems, when subjected to severe System disturbances, such as the loss of a generating plant, or Short Circuit condition.

TDC 3.9.1 FAULT CLEARING TIME

The Fault Clearance Time for a Short Circuit fault, shall not be longer than:

(i.) 160 ms for voltage levels ≥33 kV; and

(ii.) 1400 ms for voltage levels <33kV.

TDC 3.10 TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY

The Network Licensee shall propose a comprehensive plan to the Commission within one year of the effective date of this Transmission and Distribution Code that details the plans to maximize resiliency of the System in the event of extreme weather events and to best assure rapid restoration of power following any unavoidable outages. The proposed plan should include vegetation management such as setbacks for trees that could potentially fall and cause damage to the Transmission and Distribution System. This plan shall be developed by the Network Licensee in consultation with other licensees and shall expand upon the Network Licensee's current Hurricane Manual restoration procedures. This Plan shall be updated as a central part of all Long-Term and Mid-Term planning by the Network Licensee. The approved resiliency plan shall be published on the website of the Network Licensee.

All new Generation licensees shall be required to comply with the approved plan, and to provide the Network Licensee with the data required by the Network Licensee to support future plan updates.

TDC 3.11 SYSTEM PLANNING OBLIGATIONS

TDC 3.11.1 GENERAL OBLIGATIONS OF SYSTEM USERS IN SYSTEM PLANNING PROCESS

System Users with a maximum Supply Demand above 200kW, and all Generators other than Small Renewable Energy Self-Generators shall have the following general obligations in the System Planning Process under this TDC 3.11.

The Network Licensee shall have general obligations to complete the System Planning, after consultation with System Users.

Any Generator applying for connection or a modification of an existing connection to the Transmission and Distribution System shall submit to the Network Licensee the relevant Standard Planning Data and the Detailed Planning Data described in TDC 3.18, "DATA REQUIREMENTS."

When requested, System Users shall submit to the Network Licensee the relevant historical planning data for the previous year and/or the forecast planning data for the succeeding years for the planning horizon, including updated Standard Planning Data and the Detailed Planning Data described in TDC 3.18, "DATA REQUIREMENTS."

(i.) The Network Licensee may require Interconnection applicants and System

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Users to submit any Standard Planning Data described in TDC 3.18, "DATA REQUIREMENTS" necessary for the Network Licensee to evaluate the impact of any System User on the Transmission and Distribution System.

(ii.) The Network Licensee may require Interconnection applicants and System Users to submit any Detailed Planning Data described in TDC 3.18, "DATA REQUIREMENTS" to assess any additional information necessary for the conduct of a more accurate Transmission and Distribution planning studies. Such Detailed Planning Data may include, but is not limited to, circuit parameters, switchgear, and Protection arrangements of equipment directly connected to or affecting the Transmission and Distribution System, or any other data required to enable the Network Licensee to assess any implication associated with the Interconnection Points.

(iii.) Interconnection applicants and System Users shall submit the Standard Planning Data and Detailed Planning Data to the Network Licensee in the required format for a five (5) year forecast period, and an indicative estimate for the following 5 years (total 10 years horizon). This requirement applies only to long term planning and mid-term planning, for short-term planning the data will correspond to the monthly, weekly and daily horizon as described in TDC 3.2.4 "Near Term (operational) Planning". The Network Licensee shall consolidate and maintain the planning data according to the following categories:

a. Forecast data shall contain the user's best estimate of the data, including Energy and Power, being projected for the succeeding years or the horizon period applicable to the planning process.
b. Estimated equipment data shall contain the user's best estimate of the values of parameters and information pertaining to its equipment.
c. Registered equipment data shall contain validated actual values of parameters and information about the user's equipment, usually required at the time of connection.

(iv.) Interconnection applicants and System Users shall notify the Network Licensee of any change to previously submitted Standard Planning or Detailed Planning Data as soon as practicable. The notification shall contain the time and date when the change took effect, or the date that the change is expected to take effect. If the change is temporary, the time and date when the data is expected to revert to its previous registered value shall also be indicated in the notification.

(v.) If an Interconnection applicant fails to submit the required data, the Network Licensee may find the application to be incomplete and not ready for processing. If an existing System User fails to submit the required data, the Network Licensee shall use its best judgment to estimate the data, providing notice of the estimate used to the non-compliant System User. The best judgement estimate shall be considered valid for planning and studies until the existing System User submits the required data complete, in the required format, and ready for processing.

TDC 3.11.2 GENERAL OBLIGATIONS OF NETWORK LICENSEE IN SYSTEM PLANNING

The Network Licensee has the following general obligations in the System Planning

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Process:

(i) The Network Licensee shall conduct Transmission and Distribution Planning studies and evaluations, including, but not limited to, those studies detailed in TDC 3.12, "LOAD FLOW STUDIES" to TDC 3.17, "VOLTAGE STABILITY ANALYSIS" to ensure the safety and reliability of the System in order to:
   a. Evaluate the requirements of Transmission and Distribution System reinforcement projects.
   b. Ensure the requirements and standards stated within the Grid Code are met for all the users of the System.
   c. Evaluate any proposed user development, which is submitted or is expected to be submitted, in accordance with the applications and procedures stated in the Interconnection Policy.
   d. The Transmission and Distribution Planning studies shall be conducted to assess the impact on the System of the Load Forecast, or any proposed equipment change in the System, and to identify corrective measures to eliminate any deficiencies.

(ii) The Network Licensee shall conduct Transmission and Distribution Planning analysis which shall include:
   a. The determination of optimum patterns for feeder development taking into account existing or future Substations proposed by the Network Licensee;
   b. The development of optimum Reactive Power compensation programs;
   c. The development of an optimum feeder configuration and switching controls for distribution feeders;
   d. The incorporation of technologies for the integration of variable renewable generation, including installation and operation of energy storage connected to the Grid;
   e. The cost effectiveness of loss reduction measures without compromising the security standards;

(iii) The relevant technical studies and the required planning data specified in the following TDC sections shall be used as a guide in the conduct of the Transmission and Distribution Planning studies.

(iv) In addition to catering for Active Power Demand, Reactive components of power requirements should be studied, and adequate measures should be taken by installing Reactive compensation equipment at different voltage levels in a phased manner to improve power factor and cause reduction of losses.

TDC 3.12 LOAD FLOW STUDIES

The Network Licensee shall perform load flow studies to evaluate the behaviour of the Transmission and Distribution System for the existing and planned Transmission and Distribution System facilities under forecasted maximum and minimum Load conditions over a planning horizon of (i) for Long Term planning, up to ten (10) years; (ii) for mid-term planning up to 3 years; and (iii) for near term operational up to 12 months or week ahead.. These studies will determine the impact on the Transmission and Distribution System of the Interconnection of new Generating Plants, Loads, or transmission lines, as well as impact on maintenance outages or unplanned outages, and

scenarios of peak demand forecast.

Load flow simulations shall be conducted in line with the planning criteria, to include both normal and contingency conditions. The results of the studies will provide, information regarding equipment loading (lines or transformers) and bus voltages together with any deficiencies in reactive support.

Sensitivity analyses shall also be carried out to determine the impact that any proposed changes will have on the Operation of the Transmission and Distribution System at other times than peak and minimum loads.

For new transmission lines, any condition within the planning criteria that produces the maximum power flows through the existing and new lines shall be identified and evaluated in order to determine any remedial measures necessary.

TDC 3.13 SHORT CIRCUIT STUDIES

The Network Licensee shall perform short circuit studies to evaluate the effect on the Transmission and Distribution System equipment of the connection of new Generation connected to the Transmission or Distribution System and other facilities that will result in increased fault duties for the Transmission and Distribution System equipment. These studies shall identify the equipment that could be damaged when current exceeds the design limit of the equipment. The studies shall also identify the Circuit Breakers and fuses which may fail when interrupting possible short circuit currents.

Three-phase short-circuit studies shall be performed for the most demanding scenarios (either maximum or minimum generation) and for different System circuit configurations. Single line-to-ground fault studies shall also be performed for critical Transmission or Distribution System nodes. These studies shall identify the most severe conditions that the Transmission and Distribution System equipment may be exposed to, and to determine possible constraints. Alternative Transmission and Distribution System circuit configurations may be studied to reduce the short circuit current within the limits of existing equipment. The results shall be considered satisfactory when the short-circuit currents are within the design limits of equipment and the proposed Transmission and Distribution System configurations are suitable for flexible and safe operation.

TDC 3.14 SYSTEM LOSSES STUDIES

The Network Licensee shall perform System Losses studies at least every five (5) years to identify, classify, and quantify the losses in the Transmission and Distribution System, and to propose measures to gradually reduce them or control losses as economically feasible. System Loss studies shall be performed to determine the effects of any user Development and any development in the Transmission and Distribution System on the efficiency of the Transmission and Distribution System.

System loss studies shall be performed to quantify the losses in the Distribution System and its main feeders and determine optimum System open points to provide an acceptable balance between reduced losses and System reliability.

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TDC 3.15 RELIABILITY STUDIES

The Network Licensee shall perform Transmission and Distribution reliability studies every year to determine the frequency and duration of user interruptions in the Transmission and Distribution System, in order to assure the requirements stated in the Transmission and Distribution Planning Criteria are met. The historical Reliability performance of the Transmission and Distribution System shall be determined from the interruptions data of the Transmission and Distribution System. Theoretical levels of SAIDI (the System Average Interruption Duration Index) and SAIFI (the System

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Average Interruption Frequency Index) for the System should be calculated using the outage data in order to determine any system configuration changes or reinforcements to the distribution System.

SAIDI and SAIFI shall be calculated based on the definitions outlined within IEEE Standard 1366-1998, or as updated standard from time to time.

TDC 3.16 TRANSIENT STABILITY STUDIES

The Network Licensee shall perform Transient Stability studies to verify the impact of the Interconnection of new Generating Units, transmission lines, and substations and changes in Transmission or Distribution System circuit configurations on the ability of the Transmission or Distribution System to seek a stable operating point following a transient disturbance. Transient Stability studies shall simulate the outages of critical Transmission or Distribution System facilities such as major transmission lines and large Generating Units. The studies shall demonstrate that the Transmission or Distribution System performance is satisfactory if:

(i.) The System returns to a stable condition after any single outage contingency for all forecasted Load conditions; and

(ii.) The System remains controllable by other means, such as operator intervention and automatic tripping of demand or generation after multiple outage contingencies within the planning criteria.

Transient stability studies shall be conducted for all new transmission lines or substations, for the Interconnection of all new Generating Units equal to or larger than 5 MW to the Transmission or Distribution System, and for Generating Units less than 5 MW if determined necessary by the Network Licensee.

TDC 3.17 VOLTAGE STABILITY ANALYSIS

The Network Licensee shall perform periodic studies to determine if the Transmission or Distribution System is vulnerable to voltage collapse under heavy loading conditions. A voltage collapse can proceed very rapidly if the ability of System's Reactive Power supply to support System voltages is exhausted. The studies shall identify solutions such as the installation of dynamic and static Reactive Power compensation devices to avoid vulnerability to voltage collapse. In addition, the studies shall identify safe Power System operating conditions where vulnerability to voltage collapse can be avoided until solutions are implemented.

TDC 3.18 DATA REQUIREMENTS

TDC 3.18.1 GENERAL

Accurate Transmission and Distribution System studies and evaluations depend upon a large volume of input data from System Users and the Network Licensee. This data set is necessary for the development of accurate software models that can accurately simulate the System's real-time response. This section gives high-level guidance on the type of data sets required for the studies and evaluations, and data required from System Users.

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TDC 3.18.2 DEMAND

In order to carry out load flow studies, substation loads can be represented by their constant real (MW) and reactive (MVAr) power requirements. However, voltage and transient stability studies require complex models for substation loads. In the absence of these complex models the Network Licensee may continue to use the constant power model for its transient and voltage stability studies.

Demand forecast are required to enable the network to be developed in a coordinated and economic manner. A consumption/demand forecast using an econometric regression methodology is considered suitable for this purpose for long term planning studies. Historical data and forecast by demand users and new applicants should also be taken into consideration. This forecast of unit consumption is then to be developed into a peak demand forecast for each substation: this peak demand forecast data shall then be used in the System studies.

TDC 3.18.3 NETWORK LICENSEE TRANSMISSION AND DISTRIBUTION SYSTEM AND GENERATION DATA

The Network Licensee shall, in collaboration with System Users, develop and maintain a data base for Transmission and Distribution System planning. This data base shall include the data required for the planning and operation of the Transmission and Distribution System, including, but not limited to, the following data sets, as well as any other Commission approved data collection requirements:

(i.) Transformers (including voltage regulators): The primary input data for transformers includes MVA rating, primary and secondary winding voltages, windings interconnection, sequence impedances, X/R ratio, tap ranges, tap settings, emergency ratings.

(ii.) Transmission and Distribution Lines: Transmission and Distribution lines are generally represented by single-phase models with equivalent series impedances (resistance-inductance combinations) between line terminals and equivalent shunt admittances at each terminal. The primary input data required among other things are line voltage, conductor type, type of construction, thermal ratings, emergency rating and sequence impedances.

(iii.) Data of Grid connected energy storage (capacity, conversion losses, storage volume, response/ancillary services capabilities, etc)

(iv.) Generation: Generators are modelled by their real and reactive power capabilities for steady state analysis. For dynamic analysis, more detailed mathematical models are required for generators, exciters and governor control systems. The generators are represented by their mathematical model which includes the synchronous, transient and sub transient reactance and inertia constants. The excitation and governor control systems are modelled by their excitation and general-purpose governor control model respectively. The appropriate dynamic dataset and block diagram model should be provided, where necessary. Similar data must be provided by inverter-based Generators to provide appropriate dynamic dataset and block diagram models where necessary. Maximum capacity. For renewable resources, historical energy production (actual or estimated/forecasted). Data on ancillary services capability and flexibility. Information of energy storage combined with the generation.

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(v.) Other Parameters: In order to carry out Transient and dynamic stability Studies, data are required on the settings of overcurrent, distance under frequency and under voltage relays. Data are also required for circuit breaker operating time. Transient and dynamic stability studies required information on relay and breaker times and operating sequences. In order to develop a reliability data bank, outage rates and durations for all major equipment are also necessary.

TDC 3.18.4 SYSTEM USER DATA: DEMAND

System Users connected at Low Voltage shall provide the following data to the Network Licensee:

(i.) Maximum power requirement (kVA or kW); and
(ii.) If necessary, type and number of significant load items (Cookers, Showers, Motors, Welders etc.).

System Users connected at High Voltage shall provide, in addition to demand forecasts, the following data to the Network Licensee:

(i.) Connected Load including type and control arrangements; and
(ii.) Maximum Demand.

System Users with Fluctuating and Cyclical Loads shall provide, in addition to demand forecasts, the following data to the Network Licensee:

(i.) The rate of change of demand;
(ii.) The switching Interval; and
(iii.) Magnitude of the largest step change.

TDC 4. MAINTENANCE STANDARDS

TDC 4.1 COMPETENCY OF STAFF

The Network Licensee shall have in place training polices and plans that ensure that persons operating, maintaining, testing and controlling the Network Licensee Transmission and Distribution Systems are competent for the tasks to be undertaken. The policies shall include refresher training at 3-year intervals to maintain the currency of the training.

All persons operating, maintaining, testing and controlling the Network Licensee Transmission and Distribution Systems must be appropriately trained with the minimum of a wireman's licence and comply with the Carilec Linesman certificate, to ensure competency for the tasks that they will be undertaking and must receive refresher training at appropriate intervals to maintain the currency of their training.

The Network Licensee shall maintain records of training given and issue certificates indicating the areas of competency of the persons trained.

TDC 4.2 REQUIREMENT FOR INSPECTION

All Plant and Apparatus intended to form part of the Transmission or Distribution System will only become part of the Transmission or Distribution System following inspection and approval by Network Licensee, and by the Government Electrical

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Inspection Unit, to the extent required by law. Inspections are to be conducted per the Network Licensee's predeveloped manuals and procedures.

TDC 5. TRANSMISSION AND DISTRIBUTION SYSTEM INTERCONNECTION

TDC 5.1 GENERAL PROVISIONS

TDC 5.1.1 PURPOSE

This section TDC 5 specifies the normal method of interconnection to the Transmission or Distribution System and the minimum technical, design, operational and financial criteria which must be complied with by any System User. For the purposes of this TDC 5, a System User of the Transmission System includes Generation Licensees or Large Customers directly interconnected to the Transmission System due to their size. A System User of the Distribution System includes a Generation Licensee or Self-Generator Permit Holder, other than a Renewable Energy Self-Generator, and any Large Customer directly interconnected to the Distribution System.

Grenada's Transmission System is relatively small in size and as of June 2023 has no direct Generation Licensee interconnections other than Network Licensee Generation Facilities. Only Generation Licensees or Large Customers would be interconnected to the Transmission System in the future.

TDC 5.1.2 OBJECTIVE

The objective of this TDC 5 Transmission and Distribution Interconnection is to establish the minimum technical, design and operational criteria for interconnection to the Transmission or Distribution System to assure that the Network Licensee is able to maintain the Grid in compliance with all applicable requirements of the Act, regulations, the Grid Code and Network License.

TDC 5.1.3 INTERCONNECTION AGREEMENT AND PPA

The details specific to each System User's interconnection to the Transmission or Distribution System shall be addressed in an Interconnection Agreement and/or PPA if the PPA is drafted to also cover the scope required for the Interconnection Agreement.

TDC 5.2 INTERCONNECTION RESPONSIBILITIES

TDC 5.2.1 RESPONSIBILITY FOR TRANSMISSION LINE EXTENSIONS

The responsibility for financial costs and construction associated with the Transmission line extensions required to serve Large Customers or Generation Licensees and Interconnection Point Apparatus on the Transmission System shall be allocated to System Users as follows:

(i.) A Large Customer whose facility requires an extension of the Transmission System shall pay costs associated with Transmission System extension and connections, unless specifically provided otherwise by a Commission tariff decision or an Interconnection Agreement; and

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(ii.) A Generation Licensee to be connected to the Transmission System generally shall pay costs, unless specifically provided otherwise by a Commission tariff decision or by the controlling Interconnection Agreement and/or PPA.

TDC 5.2.2 RESPONSIBILITY FOR DISTRIBUTION LINE EXTENSIONS

The responsibility for financial costs and construction associated with the Distribution line extensions and Point of Supply Delivery shall be allocated to System Users as follows:

(i.) A Large Customer shall pay those costs identified by SC 3, "New and Modified Connections," unless specifically provided otherwise by the controlling Interconnection Agreement; and

(ii.) A Generation Licensee or Self-Generator Permit Holder shall pay those costs as identified in GC3.3, "Interconnection Point and Responsibilities," unless specifically provided otherwise by the controlling Interconnection Agreement and/or PPA.

TDC 5.2.3 RESPONSIBILITY FOR CUSTOMER CONNECTIONS TO DISTRIBUTION SYSTEM

For the avoidance of doubt, the costs of and responsibilities for any Customer connections to the Distribution System are presented in the Supply Code of the Grid Code in SC 3, "New and Modified Connections."

TDC 5.2.4 SMALL RENEWABLE ENERGY SELF-GENERATOR PERMIT HOLDER RESPONSIBILITIES

For the avoidance of doubt, the conditions and procedures for any Small Renewable Energy Self-Generator connection to the Distribution System is established in GC 3.12.4, "Requirements for Small Renewable Energy Self-Generators with Permits" and GC 3.12.4.2, "Small Renewable Energy Generation Facilities Code of Practice or Guidelines."

TDC 5.3 METHOD OF INTERCONNECTION

The Interconnection requirements in this Code shall be read in conjunction with any existing Interconnection Agreement, as well as any applicable regulations or Commission-approved Interconnection Code of Practice. In the event that there is any conflict between the provisions of this Code, the Commission-approved Interconnection Code of Practice or other approved regulations and any Interconnection Agreement, and the said Interconnection Agreement was signed before this Code came into effect, then the provisions of the Interconnection Agreement shall prevail, subject to the Transitional Provisions of the Management Code. The System User party to the Interconnection Agreement who is not able to bring their Apparatus and Interconnections into compliance with the Grid Code during the term of the Transition Period described in MC 1.2.1 "Transitional Provisions" shall submit a derogation request for relief under MC 1.21.1(b) prior to the end of the Transition Period.

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TDC 5.3.1 DETERMINATION OF INTERCONNECTION METHOD

The Network Licensee, in consultation with the System User, shall determine the optimum interconnection method to the Transmission or Distribution System. Because it is not technically or economically practicable to achieve uniformity in the method of interconnection for all System Users, the Network Licensee shall establish the optimum interconnection method after consultation with the System User, relying upon Prudent Utility Practices, and taking into consideration the controlling provisions of the Act, applicable regulations, and Network License, and at least the following technical and economic factors:

(i.) Safety;
(ii.) Stability of the Grid;
(iii.) Reliability of Supply;
(iv.) Geographical considerations including proximity to the Transmission and Distribution System;
(v.) Maximum Demand to be supplied;
(vi.) Generating Facility MW capacity;
(vii.) Supply voltage;
(viii.) Standby or auxiliary power requirements;
(ix.) Substation configuration; and
(x.) Costs.

TDC 5.3.2 POINTS OF INTERCONNECTION

The System User will have only a single Interconnection Point at its premises to the Transmission or Distribution System, unless otherwise negotiated and provided for in the Interconnection Agreement, with appropriate safeguards. More detailed provisions controlling Generator Points of Interconnection are provided in GC 3.5 "Interconnection Points and Responsibilities."

TDC 5.3.3 SYSTEM ANALYSIS STUDIES REQUIRED PRIOR TO INTERCONNECTION

The Network Licensee shall assure the necessary studies are completed prior to the System User's interconnection to the Transmission or Distribution System to determine the optimum interconnection method, including, but not limited to, the works required to facilitate an interconnection, and to the number of Interconnection Points. The necessary studies include those outlined in the TDC 3, "TRANSMISSION AND DISTRIBUTION PLANNING" provisions concerning System Analysis Studies (including Distribution System Impact Studies, Distribution Facilities Detailed Study, Generation Interconnection Feasibility and Generation Interconnection Facilities). The studies results shall guide the Network Licensee's determination of any conditions needed to ensure that any new interconnection will not impair the Network Licensee's ability to provide transmission and distribution services or a Supply within the statutory parameters to both new and existing System Users. Consistent with TDC 5.2, "INTERCONNECTION RESPONSIBILITIES" the System User shall generally be wholly responsible for the cost of the studies, except if otherwise provided by the Interconnection Agreement or PPA, or established in the Grid Code provisions.

TDC 5.3.4 INTERCONNECTION AGREEMENTS

Consistent with the requirements of Section 12 of the Act and related implementing

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regulations and the Generation Code, the Network Licensee shall set forth the provisions relating to interconnection to the Transmission and Distribution System in the Interconnection Agreement with a System User and, as appropriate, in a related PPA with an Independent Power Producer if the PPA is drafted to also cover the scope required for the Interconnection Agreement. The Interconnection Agreement also shall include among other provisions relating to:

(i.) Submission of information and reports relating to compliance with the relevant Interconnection conditions for that System User
(ii.) Safety Rules;
(iii.) Commissioning and periodic testing programs;
(iv.) Operation Diagrams;
(v.) Approval to connect;
(vi.) Conditions for disconnection and reconnection; and
(vii.) Conditions and the Terms and Conditions of Service.

TDC 5.3.5 CUSTOMER INTERCONNECTIONS AT LOW VOLTAGE

For low voltage (≤ 460 Volts AC) Supply interconnections to System Users, the Network Licensee shall design the connection as follows:

(i.) For any Interconnection up to 400 Volts the Supply shall be provided subject to the terms and conditions, and at the frequency and voltage set forth in TDC 3.4.1 and 3.4.2 .TDC 3.8, and TDC 6.3 and summarized as:

Standard Domestic	**Domestic/Non-domestic**
Single Phase, 2 Wire	Three Phase, 4 Wire
230 Volts	400 Volts
50 Hertz	50 Hertz

(ii.) For any low voltage interconnections at (400<V≤460V), the Supply would be considered a Complex Connection as set in the code of practice under SC 3.1.2.2(f), and the Supply shall be provided subject to the terms and conditions and at the voltage set forth in the Interconnection Agreement and/or PPA.

The System User that are Customers interconnected at low voltage shall provide, at a minimum, the information to the Network Licensee required by the SC 2.2.3 "Customer Obligations Regarding Connections" and SC 3 "New and Modified Connections," including, but not limited to:

(i.) System User name, tax identification number, address and contact details;
(ii.) Location of proposed interconnection;
(iii.) Type of Customer for interconnection (Residential, Commercial, Industrial);
(iv.) Capacity required (if not known then type of use appliances etc.); and
(v.) Identification of any large motor welders, or other energy intensive machinery.

Normal low voltage interconnections may be provided by up to three single phase pole mounted transformers of maximum 50 KVA capacity (3 x 75 KVA (225 KVA)) appropriately connected, or by pad-mounted transformer as low as 25KVA single phase to 45KVA three phase. Transformer ratings shall be in accordance with IEEE standard C 57.12.00 or equivalent standard approved by the Network Licensee.

Low voltage interconnections may be provided by ground mounted three phase pad

mount transformers for capacity requirements greater than 225 KVA where specific System User requests are made.

The normal or standard method of low voltage delivery of electricity will utilize overhead lines. The interconnection method will be consistent with the provisions of SC 3, "New and Modified Connections" for System User connections. Network Licensee may accommodate any System User requests for non-standard interconnection arrangements if technically feasible, consistent with the Commission-approved SC 3.1.2, "Code of Practice for Connections," and TDC 5.3.9, "CODE OF PRACTICE FOR INTERCONNECTION METHOD" described later in this Code.

The interconnection point for low voltage supply System Users on the Distribution System will be determined consistent with the provisions of SC 5.1, "Point of Supply Delivery" on the System User premises approved by the Government Electrical Inspection Unit. The System User may be required to provide for the interconnection from this Interconnection Point to the Metering Point.

The Metering Point location for Large Customers shall be determined consistent with the provisions of SC 5.1, "Point of Supply Delivery" and SC 8, "Metering and Billing," as well as TDC 17, "TRANSMISSION AND DISTRIBUTION METERING." The meters shall be housed in metering facilities provided by the Customer.

The Metering Point location for Generators shall be determined consistent with the provisions of GC 4, "Generation Operational Metering." The meters shall be housed in metering facilities provided by the Generator.

The Supply Code shall control the location of the Interconnection Point and the Metering Point for Low Voltage Connections, including, but not limited to, the provisions of Sections SC 2.2.3, "Customer Obligations Regarding Connections," SC 5.1.2, "Location of Point of Supply Delivery" and SC 8, "Metering and Billing." Generally, the Interconnection Point and the Metering Point will be the same location. Where the two are not co-located, the distance between the Interconnection Point and the Metering Point should be minimized, should not exceed thirty (30) meters, and should be secured to prevent unauthorized access.

TDC 5.3.6 CUSTOMER INTERCONNECTION AT MEDIUM VOLTAGE

For medium voltage interconnections (460<V≤11kV), the Network Licensee may require the System User to supply the following information prior to the connection completion date under the Interconnection Agreement:

(i.) Updated Planning Data as required in TDC 18 "Transmission and Distribution Data Registration", with any estimated values assumed for planning purposes confirmed or, where practical, replaced by validated actual values and by updated estimates for the future and by updated forecasts for items such as Demand;

(ii.) Details of the protection arrangements and settings including protection and control single line diagrams;

(iii.) Copies of all Safety Rules and Local Safety Instructions applicable at System User sites which shall be used at the Network Licensee/System User interface;

(iv.) Information to enable the Network Licensee to prepare Site Responsibility

Schedules;

(v.) An Operation Diagram for all Medium Voltage Apparatus on the System User side of the Interconnection Point;

(vi.) The proposed name of the System User Site (which shall not be the same as, or confusingly similar to, the name of any Licensee Site or of any other System User Site);

(vii.) A list of Safety Coordinators;

(viii.) A list of the telephone numbers for joint System Incidents at which senior management representatives nominated for this purpose can be contacted and confirmation that they are fully authorized to make binding decisions on behalf of the System User;

(ix.) A list of managers who have been duly authorized to sign Site Responsibility Schedules on behalf of the System User; and

(x.) Information to enable Network Licensee to prepare Site Common Drawings.

Medium voltage interconnections shall normally be overhead and provided from a radial feeder. The interconnection shall not normally be designed to provide a switched alternative supply for faults on the Transmission or Distribution System that supplies the System User. The Network Licensee will determine appropriate network configuration, and any reinforcement required to enable the interconnection to be accommodated onto the System. The interconnection shall be designed to comply with all applicable standards in the Grid Code, including restoration standards.

Alternative Interconnection arrangements may be requested based on either switched alternative, (Manual or Automatic) or parallel circuit supply. The Network Licensee may, in its discretion, provide such alternative arrangements, if all technical considerations are satisfactory. The appropriate connection charge policy in force at the time shall apply to requests for nonstandard interconnection.

In some cases (for example subdivisions) a single interconnection to a premise shall be made and multiple Metering Points shall be installed to meter individual System Users. In these cases, meters shall only be installed to provide Supply to electrically isolated System User's Systems

TDC 5.3.7 CUSTOMER INTERCONNECTION AT HIGH VOLTAGE

For high voltage interconnections (>11kV), the Network Licensee may require the System User to supply all information required of Medium Voltage Interconnections, as well as the following information prior to the completion date under the Interconnection Agreement:

(i.) connected Load including type and control arrangements;

(ii.) Maximum Demand;

(iii.) For Fluctuating and Cyclical Loads:

a. the rate of change of demand;
b. the switching Interval; and
c. the magnitude of the largest step change.

High voltage interconnections shall be either underground or overhead.

A high voltage interconnection is a nonstandard connection. Therefore, the controlling Interconnection Agreement and/or PPA shall set forth in detail the Alternate Supply arrangements and related technical requirements applicable to the System User.

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TDC 5.3.8 INTERCONNECTION OF GENERATION LICENSEES AND SELF-GENERATORS

The interconnection of a Generation Licensee is controlled by the applicable requirements of the Generation Code including, but not limited to, GC 3, "Interconnection Conditions" and GC 4, "Generation Operational Metering". The interconnection of a Self-Generator Permit Holder is also controlled by the applicable requirements of the Generation Code including, but not limited to GC 3, "Interconnection Conditions," including the specific requirements of GC 3.12.2, "Requirements for Generator Licensees" and GC 4, "Generation Operational Metering." The Self-Generator Interconnection Agreement standards shall be established by the Network Licensee consistent with the results of the relevant studies required by the TDC 3.11, "SYSTEM PLANNING OBLIGATIONS " and all relevant requirements of the Generation Code, including the minimum performance standards of GC 3.12.2, "Requirements for Generator Licensees."

For purposes of System Restoration planning, the Network Licensee normally will not identify a Self-Generator as a Black Start Generating Facility under GC 3.10.6, "Black Start Capability" or the related and procedures of TDC 12.4, "SYSTEM RESTORATION STRATEGY" and TDC 12.5, "SYSTEM RESTORATION PROCEDURES."

Self-Generator Units normally will not be permitted or required to generate when the part of the Distribution System to which they are connected is disconnected from the System, absent specific authorization in the Interconnection Agreement. Any such permission or requirement shall be detailed in the Interconnection Agreement along with detailed requirements for the required Self-Generator equipment and procedures for voltage and frequency control to ensure that such Generation will not undermine System Restoration.

These Generator Interconnection requirements are designed to enable the Network Licensee to maintain the Transmission and Distribution Systems in compliance with the controlling license standards, the Act and Grid Code requirements. For the avoidance of doubt, this TDC 5.3.8 does not apply to Small Renewable Energy Self-Generators, which are subject to the Code of Practice for Small Renewable Energy Generations Facilities under GC 3.12.4.2, "Small Renewable Energy Generation Facilities Code of Practice."

TDC 5.3.9 CODE OF PRACTICE FOR INTERCONNECTION METHOD

The Network Licensee shall submit a proposed Code of Practice for Interconnection Method, addressing both new and modified interconnections, on a time schedule to be established by the Commission, for review and approval by the Commission. Once the Code of Practice is approved, the Network Licensee shall publish the approved Code in its website and make copies available in the Network Licensee's customer service locations. Pending Commission approval, the Network Licensee shall conform to the applicable requirements of the prevailing GRENLEC Suspense Policy.

The Network Licensee may propose an integrated Code of Connections and Interconnections to satisfy both this provision and SC 3.1.2, "Codes of Practice for Interconnections." The proposed Code of Connection must provide clear guidance applicable to the various categories of Generators and Customers interconnections.

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The Code of Practice for Interconnections Method shall include a section on technical and operational standards and requirements for non-dispatchable renewable energy generation interconnections, including any standards established in the Generation Code as applicable. Working in consultation with the Grid Code Review Committee, the Network Licensee shall propose technical criteria to ensure that a non-dispatchable renewable energy Generating Facility has system for voltage control and support frequency, or other requirements from adverse effect on voltage level or voltage waveform, power factor and frequency, or produce adverse levels of voltage flicker and/or voltage harmonics, and define the conditions under which a Network Licensee may curtail delivery of electricity from a non-dispatchable renewable energy generator.

TDC 5.3.10 SCOPE OF CODE OF PRACTICE FOR INTERCONNECTION METHOD

The Code of Practice for Interconnections Method shall address the interconnection-related requirements for new and modified interconnection for:

(i.) Interconnection Applicants seeking only Supply from Transmission or Distribution System

(ii.) Independent Power Producers who have received a license under Section 14 of the Act.

(iii.) Self-Generators who have received a permit under Section 25 of the Act (excluding Small Renewable Energy Self-Generators subject to GC 3.12.4, "Requirements for Small Renewable Energy Self-Generators with Permits;") and

(iv.) Self-Generators who are exempt from a license or permit requirement under Section 13(2) of the Act, that must comply with Section 13(3) of the Act and GC 3.18, "Technical Criteria Applicable to Permit-Exempt Self-Generators" with regard to compliance with all safety and technical requirements, including, but not limited to those provisions prohibiting any form of interconnection to the Grid in order to ensure the safety of the Grid and Network Licensee personnel, and reliability of Supply.

TDC 5.3.11 CONTENTS OF CODE OF PRACTICE FOR INTERCONNECTION METHOD

The Code of Practice shall, at a minimum, address the following topics, designed to enable System Users (Generators and Customers) to interconnect to the Grid as efficiently and cost effectively as possible:

(i.) Form and required contents of application for Interconnection;

(ii.) Model Interconnection Agreement;

(iii.) The System Analysis studies that may be required, and how the determination will be made on the need for such studies;

(iv.) The standard terms and conditions for interconnections solely for Supply from the System, including responsibility of the Customer and Network Licensee for physical works completion and costs of the project, including any allocation of construction work costs between the parties;

(v.) The standard terms and conditions for interconnections of Independent Power Producer/Generation Licensee to the System, including responsibility of Generator and Network Licensee for physical works completion and costs of the project, including any allocation of construction work costs between the parties;

(vi.) The standard terms and conditions for connection of a Self-Generator Permit Holder that can sell energy to the Network Licensee;
(vii.) A Fee Schedule for modifications or upgrades to existing t interconnections, or for new interconnections, including, but not limited to, contributions to new construction works, deductions for estimated future revenue from a new line, and security deposits, accompanied by an explanation of the principles and methodology used for all calculations, with sufficient detail to enable an Applicant for an interconnection to make a reasonable estimate of the charges for a connection, and to understand any estimate of charges rendered by Network Licensee to the System User;
(viii.) Identification and documentation of authorization required of Applicant or its authorized agent or trustee, including, but not limited to, guarantees required, owner permission for accounts on property that is leased and related documentation of proof of ownership.
(ix.) Government Electrical Inspection Unit or other electrical inspection Certificate of Approval requirements.
(x.) Network Licensee Inspection of premises requirements.
(xi.) Grounds for Network Licensee denial of interconnection, including, but not limited to, failure to settle in full all current or prior accounts at the same or other premises, or Network Licensee reasonable determination that the Generator's premises or interconnection works are not safe or otherwise in good working order or will otherwise interfere with the efficient Supply of electricity by Network Licensee; and
(xii.) Any other topics pertaining to interconnections or related charges that the Commission directs, from time to time, be included in this Code of Practice.

TDC 6. POWER QUALITY STANDARDS

TDC 6.1 POWER QUALITY

Power Quality shall be defined as the stability of the Grid in terms of the voltage, frequency and the resulting current that is measured in the Transmission and Distribution System during normal conditions.

A Power Quality problem exists when at least one of the following conditions is present and significantly affects the normal Operation of the System for a minimum period of at least 3 minutes:

(i.) The System frequency has deviated from the nominal value of 50 Hz ±0.5%;
(ii.) Voltage magnitudes are outside their allowable range of variation;
(iii.) Harmonic frequencies are present in the System;
(iv.) The magnitude of the phase voltages is unbalanced;
(v.) The phase displacement between the voltages is not equal to 120 degrees; or
(vi.) Voltage fluctuations cause voltage Flicker that is outside the allowable flicker severity limits.

TDC 6.2 FREQUENCY VARIATIONS

The frequency of the System shall be consistent with TDC 3.8, "FREQUENCY CRITERIA," have a normal frequency of 50 Hz, and even under exceptional

circumstances, except contingencies, shall be controlled within the limits of ±0.5%.

TDC 6.3 VOLTAGE VARIATIONS

The voltage on the Transmission and Distribution System at each Interconnection Point shall normally remain within the limits described in TDC 3.4.1, "NORMAL CONDITIONS" and TDC 3.4.2, "Contingency Conditions."

TDC 6.4 VOLTAGE WAVEFORM QUALITY

All Plant and Apparatus connected to the Transmission or Distribution System, and that part of the Transmission or Distribution System at each Interconnection Site, should be capable of withstanding distortions of the voltage waveform in respect of harmonic content and phase unbalance.

TDC 6.5 EXCEPTIONAL CONDITIONS

Some events such as system faults which involve the Transmission or Distribution System, or a Generating Facility, or faults that lead to loss of more than one Generating Unit in the System, or where a Significant Incident has occurred or during constrained operating conditions such as light load conditions and shortage of Active/Reactive Power, can result in variations outside the normal power quality standards as outlined in this section TDC 6, "POWER QUALITY STANDARDS." During these events, the Network Licensee shall be relieved of its obligation to comply with the System quality standards referenced in the aforementioned.

TDC 7. PLANT AND APPARATUS RELATING TO INTERCONNECTION SITES

TDC 7.1 GENERAL REQUIREMENTS

All Plant and Apparatus owned by either the Network Licensee or the System User at the Interconnection Point shall be compliant with the requirements in TDC 7.

TDC 7.2 SUBSTATION PLANT AND APPARATUS

All circuit breakers, switch disconnectors, earthing devices, power transformers, voltage transformers, reactors, current transformers, surge arresters, bushings, neutral equipment, capacitors, line traps, coupling devices, external insulation and insulation co-ordination at the System User Interconnection Point shall be constructed, installed and tested in accordance with the current edition at the time of construction of the following codes and standards, or their international equivalents and Prudent Utility Practice.

ACI	American Concrete Institute
ANSI	American National Standards Institute
ASCE	American Society for Civil Engineers
ASME	American Society for Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
ASTM	American Society for Testing Materials

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AWS	American Welding Society
GDBS	Grenada Bureau of Standards
IEC	International Electro-technical Commission
IEEE	Institute of Electrical and Electronic Engineers
ISO	International Organization for Standardization
NEC	National Electric Code
NEMA	National Electric Manufacturers Association
NESC	National Electric Safety Code
NETA	National Electric Testing Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
OBC	OECS Building Code
UL	Underwriters Laboratory

TDC 7.3 GENERATOR INTERCONNECTION POINTS

The requirements for the design of Interconnection Points between Generators and the Network Licensee are set out in the GC 3.3, "Interconnection Responsibilities."

TDC 7.4 INTERCONNECTION POINTS TO TRANSMISSION AND DISTRIBUTION SYSTEM OR TO LARGE CUSTOMERS/USERS

TDC 7.4.1 PROTECTION ARRANGEMENTS

Protection of Distribution Systems and of Large Customers directly connected and receiving energy from the Transmission and Distribution System must meet the following minimum requirements:

(i.) The clearance times for faults on the Transmission and Distribution System or equipment directly connected to the Transmission System from fault inception to circuit breaker arc extinction, shall be set out in an Interconnection Agreement where applicable, but shall not be slower than[2]:

a. 160 ms for faults cleared by bus bar protection at 33 kV; and
b. 100 ms for faults cleared by ultra-high speed directional comparison protection on 33 kV. Slower fault clearance times for faults may be agreed but only if System requirements permit.

(ii.) In order to provide for the contingency of potential failure of the protection systems to meet the above fault clearance time requirements, the System User must provide back-up protection. The Network Licensee shall also provide back-up protection on the System, which shall result in a fault clearance time slower than that specified for the System User back-up protection so as to provide discrimination.

(iii.) For interconnections with the Transmission and Distribution System, the back-up protection to be provided by the System User must have a fault clearance time not slower than 200 ms for faults on the System User Apparatus.

[2] Adherence to best practice international standards is required

TDC 7.4.2 FAULT DISCONNECTION FACILITIES

Where no Network Licensee circuit breaker is provided at the System User Interconnection Point, the User must provide the Network Licensee with the means of tripping all the System User circuit breakers necessary to isolate faults or System abnormalities on the Transmission and Distribution System. In these circumstances, for faults on the system of the System User, the System User protection should also trip higher voltage Network Licensee's circuit breakers.

TDC 7.4.3 AUTOMATIC SWITCHING EQUIPMENT

The Network Licensee may require a System User to install automated switching equipment to ensure automatic recloser of circuit breakers following faults on the system of the System User.

TDC 7.4.4 RELAY SETTINGS

Protection and relay settings shall be coordinated across the Interconnection Point to ensure effective disconnection of faulty Apparatus. The process for the coordination of relay settings shall be defined by the Network Licensee.

TDC 7.4.5 WORK ON PROTECTION EQUIPMENT

Where the Network Licensee owns the bus bar at the Interconnection Point, the Network Licensee shall have the right to be present at any work performed by the System User on the bus bar protection or related AC or DC wiring. The System User shall give adequate notice of such work to Network Licensee to enable attendance.

TDC 7.4.6 UNDER FREQUENCY RELAYS

As required under the GC Appendix C, tables on "Grenada Transmission and Distribution System Low and High Voltage Ride-Through," Generating Facilities are required to disconnect from the Grid if the frequency is outside established ranges. Consistent with the GC 7, "Load Shedding and Power Restoration," the Network Licensee shall submit a summary of the technical requirements for System User disconnection in the event of Under Frequency conditions and submit same to the Commission for approval. The table may be included in the technical requirements of the Interconnections Code of Practice.

TDC 7.4.7 CONFIGURATION OF SUBSTATIONS

All substations shall have the capability to disconnect or separate from the Transmission and Distribution System, any transmission line and/or Generating Unit which is interconnected to the substation.

For reasons of ensuring safety and reliability of operation, substations with more than three transmission lines shall have a breaker and a half configuration, and Generating Unit Interconnections shall have a double bus double breaker configuration, unless otherwise agreed in the Interconnection Agreement and/or PPA by the Network License. The substation shall be equipped with all requisite protection measures necessary to meet the Network Licensee's System protection standards as set out in TDC 7.5, "PROTECTION REQUIREMENTS."

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TDC 7.5 PROTECTION REQUIREMENTS

The minimum protective Systems applicable to interconnection of Generation Licensees and Self-Generator Permit Holders are set out in the GC 3.11, "Protection Requirements." The Network Licensee may require additional protection measures in order to address the results of the Planning Studies required by TDC 3, "TRANSMISSION AND DISTRIBUTION PLANNING" to ensure that this Transmission Distribution Code requirements for Grid stability are maintained.

TDC 8. GENERATION FACILITY SITE RELATED CONDITIONS

TDC 8.1 GENERAL

The owner of any Generating Facility and/or Apparatus, including Small Renewable Energy Self-Generators, has the responsibility for the construction, commissioning, control, operation, and maintenance of the Generating Facility and/or Apparatus, unless there is a written agreement between the Network Licensee and System User providing for an alternative arrangement.

(i.) It is anticipated that all Low, Medium, and High Voltage Interconnections to Large Customers (or in the rare case of a Generation Licensee or Self-Generator Permit Holder) will be considered a Complex Connection under SC 3, "New and Modified Connections, and the Code of Practice for Connections approved by the Commission under SC 3.1.2.2(f), "Contents of Codes of Practice."

(ii.) In case of any Low Voltage Interconnections for any Customer System User that qualifies as a Category I Obligatory Connection or a Category II Contributory Connection under the SC 3 "New and Modified Connections, and the Code of Practice for Connections approved by the Commission under SC 3.1.2.2(c) or (d), the Network Licensee shall provide the meter, cut-outs and other equipment depending upon the requirement, at a place mutually agreed upon so as to provide unobstructed access to the Network Licensee at all times, consistent with the provisions of the Supply Code of this Grid Code.

(iii.) In case of any Low Voltage Interconnection for Supply of any System User that qualifies as a Complex Connection under the SC 3, "New and Modified Connections," and the Code of Practice for Connections approved by the Commission under SC 3.1.2.2(f), or for any Medium or High Voltage Interconnection System Users, the Network Licensee shall provide suitable meters including Current Transformers (CTs) and Potential Transformers (PTs), Circuit Breaker or air break switch (isolator), or high voltage fuse, or other suitable device. The System User should provide unobstructed access to the Network Licensee at all times to the Network Licensee meters and other Apparatus. The System User also shall provide similar control devices on the System User side of the Interconnection Point.

(iv.) A System User requiring High Voltage Interconnection and Supply must provide and maintain at his expense a locked and weatherproof enclosure of a design to be approved by Network Licensee for purposes of housing the Network Licensee's High Voltage switchgears and metering equipment.

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Such enclosure may also be used by the System User for housing its own High Voltage switchgears, transformer and other Apparatus including capacitors with the written permission of the Network Licensee, but such enclosure shall not be used for any other purpose. A Network Licensee shall have access to the enclosure at all times without notice for the purpose of inspecting, testing and maintenance of its Apparatus.

(v.) In case of High Voltage System Users, switchgears of adequate capacity together with suitable protective devices in accordance with the Network Licensee's protection code and other relevant standards shall be used so as to afford full protection to a Network Licensee's Apparatus placed on the System User's premises.

(vi.) Network Licensee Apparatus located on the System User's premises shall remain the property of the Network Licensee, and may not be operated, handled or removed by anyone who is not in the employment of the Network Licensee. Likewise, the seals, name plates and distinguishing numbers and/or the marks of a Network Licensee affixed on the said property shall not be interfered with on any account or broken, removed or erased except by employees of the Network Licensee duly authorized for that purpose.

(vii.) The Network Licensee may accede to a System User's written request that the Network Licensee isolate the Plant and Apparatus supporting Supply to that System User, provided such operation by a Network Licensee does not affect continuity of Supply to other System Users.

(viii.) Every System User shall compensate the Network Licensee for any damage and cost of repairing any loss or damage caused to the mains, apparatus or instrument or any other Apparatus or property of a Network Licensee in the System User's premises caused by any act, neglect or default of the System User, servants or persons employed by the System User, and in addition, shall pay such penalties prescribed or lawfully due to the Network Licensee for unauthorized interference with the Network Licensee's property or seals.

TDC 8.2 RESPONSIBILITIES FOR SAFETY

Before interconnection to the Transmission and Distribution System at Medium Voltage or High Voltage level, the Network Licensee and the System User shall enter into a written agreement describing the safety rules, as set forth in the Network Licensee's Health and Safety Manual, to be used for work on Plant and/or Apparatus at the Interconnection Point.

TDC 8.3 SITE RESPONSIBILITY SCHEDULES

In order to inform site operational staff and the Network Licensee's Control Engineers of agreed responsibilities for Plant and/or Apparatus at the operational interface at Medium Voltage or High Voltage level, the Network Licensee shall prepare, after consultation with affected System Users, a Site Responsibility Schedule. This Schedule shall be included in the Interconnection Agreement and/or PPA if the PPA is drafted to also cover the scope required for the Interconnection Agreement.

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TDC 8.4 OPERATION DIAGRAMS

An Operation Diagram shall be prepared for each Interconnection Site at which an Interconnection Point is at the Medium Voltage or High Voltage level System Users shall provide Operation Diagrams of their Apparatus to the Network Licensee in a suitable form as specified by the Network Licensee. The Interconnection Agreement (and/or PPA if the PPA is drafted to also cover the scope required for the Interconnection Agreement) shall allocate responsibility for preparation of the Interconnection Site Operation Diagram between the Network Licensee and the System User.

The Operation Diagram shall include all Apparatus and the interconnections to all external circuits and incorporate numbering, nomenclature and labelling. At those Interconnection Sites where SF6 gas insulated metal enclosed switchgear and/or other gas-insulated Medium Voltage Apparatus is installed, those terms must be depicted within an area delineated by a chain dotted line which intersects gas-zone boundaries. The nomenclature used shall conform to that used on the relevant Interconnection Site and circuit.

The Operation Diagram (and the list of technical details) is intended to provide an accurate record of the layout and circuit interconnections, ratings and numbering and nomenclature of Apparatus at System User facility.

TDC 8.5 COMPOSITE OPERATION DIAGRAM

The Network Licensee shall have the responsibility to develop a composite Operation Diagram compiling information provided by both the Network Licensee and the System User under this TDC 8. The Composite Operation Diagram shall be the definitive Operation Diagram for all operational and planning activities associated with the Interconnection Site. The Network Licensee shall provide the System User with a proposed Composite Operation Diagram and shall allow the System User at least fifteen (15) days to review and provide written acceptance or objection to the proposed Composite Diagram. If a Dispute arises as to the accuracy of the proposed Composite Operation Diagram, a meeting between the Network Licensee and the System User shall be held at the Interconnection Site as soon as reasonably practicable to resolve the matters in Dispute and to make any needed adjustments to the Operation Diagram. If the Network Licensee and the System User cannot resolve the Dispute through direct discussions, then either party may refer the matter to the Commission within thirty (30) days of the System User written notice of objection pursuant to MC 11, “Grid Code Dispute Resolution Procedures.”

TDC 8.6 SITE COMMON DRAWINGS

Site Common Drawings shall be prepared for each Interconnection Site which is connected at Medium Voltage or High Voltage level and shall include Interconnection Site layout drawings, electrical layout drawings, common Protection/control drawings and common services drawings.

The System User shall submit to the Network Licensee, a draft Site Common Drawing with all the information referenced above for that portion of the Interconnection Site under the System User’s control, after consultation with the Network Licensee to agree

upon the boundary of control between the System User and the Network Licensee. Following receipt of the System User's submittal, the Network Licensee shall prepare and submit to the System User draft Site Common Drawings, consistent with the requirements of the Interconnection Agreement and/or PPA, for the entire Interconnection Point Site for review by the System User. The System User shall have at least fifteen (15) days to review and provide a written acceptance or objection to Network Licensee concerning the contents of the proposed Composite Diagram. The System User shall then prepare, produce and distribute, using the information submitted by the Network Licensee, Site Common Drawings for the complete Interconnection Site in accordance with the requirements of the Interconnection Agreement.

If a Dispute arises as to the accuracy of the draft Composite Operation Diagram, a meeting shall be held at the Interconnection Site, as soon as reasonably practicable, between the Network Licensee and the System User, to resolve the matters in Dispute and to make any needed adjustments to the Operation Diagram. If the Network Licensee and the System User cannot resolve the Dispute through direct discussions, then either party may refer the matter to the Commission within thirty (30) days of the System User pursuant to MC 11, "Grid Code Dispute Resolution Procedures."

TDC 8.7 CHANGES TO SITE COMMON DRAWINGS

When the Network Licensee or a System User becomes aware that it is necessary to change any aspect of the Site Common Drawings at an Interconnection Site, it shall notify the other party and amend the common site drawings in accordance with the procedures provided by the Network Licensee. If the change can be dealt with by notifying the other party in writing of the change and for each Party to amend its copy of the Site Common Drawings, then each party shall so amend.

TDC 8.7.1 VALIDITY OF SITE COMMON DRAWINGS

The final Site Common Drawings for the complete Interconnection Site prepared under TDC 8.6, "SITE COMMON DRAWINGS" shall be the definitive Site Common Drawings for all operational and planning activities associated with the Interconnection Site. If a Dispute arises as to the accuracy of the Site Common Drawings, a meeting shall be held at the site, as soon as reasonably practicable, between the Network Licensee and the System User, to endeavour to resolve the matters in Dispute and to make any needed adjustments to the Site Common Drawings. If the Network Licensee and the System User cannot resolve the Dispute through direct discussions, then either party may refer the matter to the Commission within thirty (30) days of the System User pursuant to MC 11, "Grid Code Dispute Resolution Procedures."

TDC 8.8 ACCESS

(i.) The Network Licensee may, at any reasonable time, in accordance with the Grid Code, enter any Interconnection Site premises to which electricity is, or has been, supplied on land, under, over, along, across, in or upon which the electric supply-lines or other works have been lawfully placed for the purpose of:

a. Inspecting, testing, repairing or altering the electric lines, meters,

fittings, works and apparatus for the supply of electricity belonging to a Network Licensee; or

b. Ascertaining the amount of electricity supplied or the electrical quantity contained in the supply; or

c. Removing where a supply of electricity is no longer required, or where a Network Licensee is authorized to take away and disconnect such supply, any electric lines, meters, fittings, and works or apparatus belonging to a Licensee.

(ii.) If a low voltage interconnection to a System User qualifies as an Obligatory Connection under the SC 3.1.2.2(c) or a Contributory Connection under the SC 3.1.2.2(d), "Codes of Practice for Connections", the Network Licensee shall conform to the Supply Code provisions concerning Network Licensee access to Customer premises under SC 2.2.6, "Access to Premises."

(iii.) For any other low voltage, and for all medium and high voltage interconnections, the Interconnection Agreement (and/or PPA if the PPA is drafted to also cover the scope required for the Interconnection Agreement) shall provide for Network Licensee access to the Customer premises for the purposes stated in subparagraph (i.) (a) to (c) above.

(iv.) The Network Licensee, or its authorized agent, may also access Interconnection Site Premises either pursuant to a judicial order or after giving reasonable notice of twenty-four hours in writing to the owner or occupier of the Interconnection Site for the purposes stated in subparagraph (i.) (a)-(c) above. When the Network Licensee is not able to contact the owner or occupier at the address of record, the Network Licensee may post a notice at the Interconnection Site in a conspicuous position concerning its intent to enter the premises.

(v.) Where a System User refuses to allow the Network Licensee, or its authorized agent, to enter the System User's Premises, or when a Network Licensee or its authorized agent has so entered and is prevented from performing activities authorized by this Code, or when the owner or occupier of the Interconnection Site Premises fails to give reasonable facilities for the Network Licensee entry or performance, a Network Licensee may, after the expiry of twenty-four hours from the service of a notice in writing to the System User, or posted thereon in a conspicuous position, disconnect the Interconnection or Supply to the System User for so long as such refusal or failure continues.

TDC 8.9 MAINTENANCE STANDARDS

All Plant and Apparatus at the Interconnection Point shall be operated and maintained in accordance with the Network Licensee's Standard Operating procedures and standards, consistent with Prudent Utility Practice, and in a manner, that shall not pose a threat to the safety of any personnel or cause damage to the Plant and Apparatus of the Network Licensee or the System User.

The System User shall maintain a log containing the test results and maintenance records relating to its Plant and Apparatus at the Interconnection Point and shall make this log available when requested by the Network Licensee.

The Network Licensee shall maintain a log containing the test results and maintenance

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records relating to its Plant and Apparatus at the Interconnection Point and shall make this log available when requested by the System User.

Either Party shall have the right to inspect the test results and maintenance records relating to the other Party's Plant and Apparatus at any time.

TDC 8.10 SITE OPERATIONAL PROCEDURES

The Network Licensee and System Users at an Interconnection Point shall make available staff to take necessary safety precautions and carry out operational duties as may be required to enable access to the Interconnection Point and for work/testing to be carried out at the Operational Interface, as well as for all other Operation of Plant and Apparatus connected to the Transmission and Distribution System.

TDC 8.10.1 SWITCHING INSTRUCTIONS

Transmission and Distribution voltage level switching shall only be carried out with the prior written permission of the Network Licensee, as detailed in the Network Licensee's Switching & Lockout/Tagout Procedure, except for agreed routine switching or in case of System Emergencies as described below. Persons required to carry out any switching must be specifically certified and authorized by the Network Licensee to carry out such switching.

For planned switching, the System User shall follow Network Licensee's pre-approved written instructions, and shall execute those instructions upon the Network Licensee's verbal authorization.

For operational switching, the Network Licensee as System Operator will use the SCADA system to implement most of the switching under normal circumstances. If manual operational switching is required, the Network Licensee will perform the required switching operations under normal operational conditions.

For emergency switching, the Network Licensee and System User shall agree upon the switching procedures to be used in emergency situations.

The following procedures shall be included in any emergency switching procedures:

(i.) When switchgear, normally operated to the instruction of the Network Licensee has been operated without its instruction, the responsible System User shall notify the Network Licensee immediately. Switchgear normally operated to the instruction of the Network Licensee shall not be closed without the Network Licensee's permission;

(ii.) The Network Licensee shall ensure that any instruction for emergency switching is repeated phrase by phrase and written down in a log by the System User, as received. At the termination of the message the System User shall read back the instructions in full to the Network Licensee for confirmation.

(iii.) Instructions from the Network Licensee shall be carried out without delay by the System User, and at the time of completing the operation or sequence of operations the System User shall report back to the Network Licensee; and

(iv.) If the System User determines in good faith that the Network Licensee instructions will result in conditions that endanger life or substantial property damage, the System User may decline the switching instructions but shall be

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subject to any applicable penalties for violation of the Interconnection Agreement and/or PPA, if any.

TDC 9. OPERATIONAL COMMUNICATIONS

When an Incident has occurred on the Transmission or Distribution System, which may have been caused or exacerbated by an Operation or Incident on the system of a System User, the Network Licensee, in reporting the Incident on the Transmission or Distribution System to other System Users, can pass on what it has been told by a System User in relation to the Operation or Incident on that System User System. The Network Licensee shall follow the procedures set forth within TDC 12.2, "EMERGENCY AND CONTINGENCY PLANNING."

TDC 10. DEMAND CONTROL

TDC 10.1 INTRODUCTION

This TDC 10 "Demand Control" s concerned with the provisions made by the Network Licensee and procedures to be followed by the Network Licensee and System Users to permit a reduction in Demand in the event that there is insufficient Generation available to meet Demand in all or any part of the Transmission or Distribution System and/or in the event of problems on the Transmission or Distribution System and in maintaining power quality and other System security standards, including, without limitation, in the event of both a steady state shortfall of generation and a transient shortfall of generation following a sudden loss of generation. These Network Licensee procedures shall fully incorporate the requirements set forth in GC 6, "Communications and Reporting" and GC 7, "Load Shedding and Power Restoration."

TDC 10.2 OPERATING PROCEDURES

(i.) The Network Licensee shall develop and maintain operating procedures for the safe operation of the Generating Units and Transmission and Distribution System. These procedures shall be adhered to by the Generator and all System Users and the Network Licensee (the parties) when operating equipment on the Transmission and Distribution System.

(ii.) Each Generator shall be responsible for his own safety rules and procedures at least in compliance with the relevant safety legislation. Generators shall ensure that these rules and procedures are compatible with Network Licensee developed procedures defined in paragraph (i).

(iii.) Generators and the Network Licensee shall enter into operating agreements as defined in the Network Licensee License.

TDC 10.3 OPERATIONAL LIAISON

(i.) The Network Licensee shall be responsible for the appointing of employees/agents with sufficient expertise to operate the Transmission and Distribution System and shall establish direct communication channels with all Generators to ensure a timely and efficient flow of information exchange among all these Parties.

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(ii.) If any of these Parties experiences an emergency, the other Parties shall inform and assist as may be necessary to ensure that such emergency does not jeopardize the operation of the Transmission and Distribution System or the Generator equipment.

(iii.) Subsequent to paragraph (ii) above, the Parties shall ensure that the emergency notification contain sufficient details in describing the event including the cause, timing and recording of the event to assist the recipient in assessing the risk and implications to the Transmission and Distribution System or the Generator equipment.

(iv.) Each interconnected Generation Licensee or Self-Generator Permit Holder shall comply with GC 8, "Generator Maintenance Planning" requirements, and shall submit the scheduled maintenance plan and a test and inspection plan for all equipment, systems and protection schemes installed at the Interconnection Point. The interconnected Generator shall cooperate with the Network Licensee in developing schedules that address concerns of both Generator and Network Licensee.

(v.) All other interconnected System Users shall comply with TDC 10.6, "MAINTENANCE COORDINATION/OUTAGE PLANNING" and submit the required plans and scheduling information to Network Licensee.

(vi.) For planned events which may have an operational effect on the Transmission or Distribution System or on Generator equipment, other than those maintenance outages already scheduled under GC 8, Generator Maintenance Planning," or under TDC 10.6, "MAINTENANCE COORDINATION/OUTAGE PLANNING," the Party planning the event shall notify the affected Party seven (7) calendar days before the event.

(vii.) The Network Licensee and Generators shall agree on the bus-bar configuration(s) at each Interconnection Point during normal and emergency conditions. Details of such configuration(s) shall be included in the Interconnection Agreement and/or PPA between the parties.

TDC 10.4 INDEPENDENT ACTION BY PARTICIPANTS

(i.) The Network Licensee and all Generators and other System Users shall have the right to reduce energy injected/delivered or demand, or to disconnect a point of connection under emergency conditions, if such action is necessary for the protection of life, equipment, or other property. Each party shall give advance notice of such action where possible. Examples include, but are not limited to, equipment malfunctions, such as non-functioning circuit breakers, or hot connections. All Network Licensee Interconnection Agreements and/or PPA shall make provision for this type of emergency situation.

(ii.) During System User emergencies that require load shedding, the request to shed load shall be initiated in accordance with agreed procedures prepared and published by Network Licensee under GC 7, "Load Shedding and Power Restoration."

TDC 10.5 DEMAND AND VOLTAGE CONTROL

(i.) The Network Licensee shall implement demand control measures when:

a. Abnormal conditions exist on the Transmission or Distribution

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System;

b. Multiple outage contingencies exist resulting in island grid operation; and
c. Any other operational event the Network Licensee deems to warrant the implementation of demand control measures for the safe operation of the Transmission and Distribution System.

(ii.) Demand control shall include but is not limited to:
a. System User demand management;
b. System User disconnection;
c. Automatic low frequency disconnection;
d. Emergency manual disconnection;
e. Voluntary load curtailment; and
f. Manual load shedding.

(iii.) The Network Licensee shall develop load reduction procedures to reduce load in a controlled manner by reducing voltage or disconnecting System User loads, consistent with the GC 7, "Load Shedding and Power Restoration" generally, and the Under-frequency Load Shedding Scheme, and the procedures shall be updated as required time to time.

(iv.) The Network Licensee shall coordinate both the development and implementation of demand control measures with affected System Users.

(v.) Transmission and Distribution System voltages shall be controlled during normal operation to be at least within this Code limits, or as otherwise established in an Interconnection Agreement (and/or PPA if the PPA is drafted to also cover the scope required for the Interconnection Agreement) at the Interconnection Point.

(vi.) The Network Licensee shall be responsible for maintaining reactive power management including all the facilities for reactive power compensation on the Transmission and Distribution System, and interconnected Generation Licensees and Self-Generator Permit Holders, to ensure compliance with the controlling operational voltage parameters and power factor parameters as established in the Generation Code of this Grid Code, or as otherwise established in an Interconnection Agreement and/or PPA.

TDC 10.6 MAINTENANCE COORDINATION/OUTAGE PLANNING

TDC 10.6.1 RESPONSIBILITIES OF THE NETWORK LICENSEE

(i.) The Network Licensee shall compile an outage program covering a period of 3 years for the Transmission and Distribution System reflecting the maintenance schedules of Generation Licensees, Self-Generator Permit Holders, and Large Customers. The outage program shall be consistent with the requirements of GC 8, "Generator Maintenance Planning," and shall include the:
a. Roles and responsibilities of a Generator providing outage notices and of a Large Customer providing notice of substantial demand reduction;
b. Roles and responsibilities of the Network Licensee;
c. Transmission and Distribution outage guidelines;

(ii.) The Network Licensee shall coordinate information from the Generation

Maintenance Planning process of the GC 8, "Generator Maintenance Planning," and information from Large Customer s concerning scheduled maintenance or other planned events that can significantly affect Demand and may affect the performance of the Transmission and Distribution System to determine whether additional or fewer resources may need to be committed during the planned reduction periods.

(iii.) Interconnected Generators with rated generating capacity of 500kW or greater and not subject to central dispatch shall furnish to the Network Licensee information on planned outages in order for the Network Licensee to properly plan, and coordinate its control, maintenance and operation activities.

(iv.) The maintenance/outage program shall be coordinated with the Generation Manual Load Shedding and System Restoration Plan.

(v.) The Network Licensee and the Generators with Generating Facility with a rated capacity greater than 500kW shall meet to revise, discuss and produce a coordinated outage plan consistent with the information and plans developed under GC 8, "Generation Maintenance Planning."

TDC 10.6.2 OUTAGE PROCESS

(i.) The Network Licensee shall develop and maintain an electronic Transmission and Distribution System maintenance scheduling system, which incorporates the information submitted to and the Committed Generating Unit Maintenance Schedule developed under GC 8.3, "Annual Commitment of Maintenance Program," and any revisions thereto developed under GC 8.4, "Changes to the Committed Maintenance Schedules."

(ii.) The Network Licensee shall make available to System Users an outage schedule of all planned outages on the Transmission and Distribution System. The outage schedule shall cover a minimum period of one week. The schedule shall be updated and published weekly.

(iii.) It is anticipated that any requests for outage changes will be processed according to the advance notice deadlines set forth in the Generation Maintenance Planning process of GC 8, "Generator Maintenance Planning," and the related Transmission and Distribution System outage planning process of this TDC 10.6, "MAINTENANCE COORDINATION/OUTAGE PLANNING." However, in extraordinary circumstances requiring action in less time than required by these provisions, as soon as a System User identifies the need for the outage change, it shall immediately notify the Network Licensee. The Network Licensee shall then enter the System User request into the Transmission and Distribution maintenance scheduling system as an extraordinary circumstance requested outage with the planned outage dates, times, reason, type of maintenance and requested urgency provided by the System User.

(iv.) If the Network Licensee determines that the proposed outage does not pose an unacceptable risk to the Transmission and Distribution System or System Users, the Network Licensee may add the requested outage to the scheduled outage calendar, and the scheduler shall confirm the booking. If the requested outage is subject to the outcome of another booking, the two booking entries shall be linked. If the request cannot be accommodated, it shall be marked

as “Refused”, with a reason and/or an alternative suggestion for a time being given.

(v.) When it is time for the confirmed booking to be executed (the outage becoming effective), the status shall be changed to “Taken” by the Network Licensee if approving (i.e., not refusing) the outage. While an outage is in progress, the responsible Parties shall report the actual state of the progress to the Network Licensee, who shall enter this information into the system log/scheduling system. This allows for the progress of the outage to be monitored by those concerned. The Network Licensee may cancel an outage when system conditions dictate such action.

(vi.) When the outage has been completed it shall be the responsibility of the Network Licensee to change the status of the outage to “Completed.”

(vii.) When an outage is cancelled, refused or postponed it is the responsibility of the person cancelling or refusing the outage to furnish the reasons for cancellation or refusal in writing. The Transmission and/or Distribution controller receiving the cancellation or refusal shall then note this outage as “Cancelled.”

TDC 10.6.3 RISK-RELATED OUTAGES

(i.) Any planned maintenance or outage activities at a Generation Licensee or Self-Generator Permit Holder Generating Facility that carry a potential risk of shortfall in Generation capacity to the System or other disturbance of Transmission and Distribution System Operations must be scheduled by the Generator with the Network Licensee consistent with the scheduled outage procedures set forth in the Generation Maintenance Planning process of GC 8, “Generator Maintenance Planning,” and the related Transmission and Distribution System outage planning process of TDC 10.6, “MAINTENANCE COORDINATION/OUTAGE PLANNING”. The Generator requesting the outage must cooperate with the Network Licensee in developing an executable contingency plan, but the compilation of the contingency plan is the responsibility of the Network Licensee.

(ii.) The contingency plan, in certain cases, may address recurring scenarios, and may be used repeatedly whenever the risk-related outages occur in the future, with revisions as required to address new developments.

(iii.) Contingency plans shall consist of five parts:

a. Security linking of feeders prior to the outage, to ensure minimal risk to System Users;
b. Returning the Generating Facility that is on outage back to service as soon as possible;
c. Restoring Supply to System Users by utilizing by-pass schemes;
d. Load shedding if necessary (load profiles shall be made available by the System User);
e. Listing of contact persons.

(iv.) Responsibilities during the compilation of contingency plans are as follows:

a. The Network Licensee shall be responsible for identifying risk-related outages;
b. The Network Licensee and affected Generators shall be responsible for identification of the load at risk and implementation of the load

shedding in the said contingency plan.

(v.) If the contingency plan indicates that load shedding must take place it shall include the following details:

a. The total amount of load to be shed in relation to the load profile;
b. The point at which System Users' load must be shed for optimal results;
c. The Network Licensee shall confirm that it is possible to execute the contingency plan successfully.

TDC 10.6.4 REFUSAL/CANCELLATION OF OUTAGES

(i.) No party may unreasonably refuse or cancel a confirmed outage;

(ii.) The direct costs related to the cancellation/postponement of an outage shall be allocated consistent with the provisions of the Interconnection Agreement and/or PPA between the Network Licensee and the Generator.

TDC 10.6.5 COMMUNICATION OF SYSTEM CONDITIONS, OPERATIONAL INFORMATION AND DISTRIBUTION SYSTEM PERFORMANCE

(i.) The Network Licensee shall update Grid conditions from time to time, and communicate these, or changes from a previous communication to all affected System Users;

(ii.) The Network Licensee shall be responsible for providing System Users with operational information as may be agreed from time to time. This shall include information regarding planned and forced outages on the Network Licensee, consistent with any requirements of the Commission;

(iii.) The Network Licensee shall inform affected System Users of any Grid condition that is likely to impact that System User's short or long-term operation;

(iv.) The Network Licensee shall timely communicate any changes or modifications to the Transmission or Distribution System to affected System Users;

(v.) The Network Licensee shall report to the Commission on the following parameters within ninety (90) days of the close of each month: compliance with SC Appendix A "Required Quality of Service Standards", losses, interruptions, and energy sold and purchased by Network Licensee. Network Licensee also shall submit the annual operational data required by Section 12 of the Act by February 1 of each year.

TDC 10.6.6 UNPLANNED INTERRUPTIONS OR OUTAGES

(i.) The Network Licensee shall prepare plans to respond to unplanned Transmission and Distribution System interruption and outages, consistent with GC 7.6, "Contingency Plans for Power Restoration" and GC7.7, Periodic Review of Restoration Plan, and with TDC 12.4, "SYSTEM RESTORATION STRATEGY" and TDC 12.5, "SYSTEM RESTORATION PROCEDURES." Those plans shall require a System User to comply with reasonable and appropriate instructions from the Network Licensee and shall further:

a. Require the System User to provide the Network Licensee with

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emergency access to any System User-owned distribution equipment normally operated by the Network Licensee, or to Network Licensee owned equipment on System User's property, consistent with the access requirements of GC 3.17, "Disconnection of Generator by the Network Licensee," TDC 8.8, "ACCESS," SC 2.2.6, "Access to Premises," as well as any applicable condition in the Interconnection Agreement and/or PPA;

b. Interrupt supply to the System User as needed to restore the Transmission or Distribution System, consistent with the provisions of GC 7, "Load Shedding and Power Restoration;"

c. Identify System Users assigned with back up Generation Facilities.

(ii.) Subsequent to clause (i) above, the Network Licensee shall make arrangements to notify the affected System Users about the expected duration and other details of unplanned interruptions or outages.

TDC 10.6.7 PLANNED INTERRUPTIONS OR OUTAGES

For planned interruptions or outages, the Network Licensee shall provide the affected System Users with information relating to the expected date of the outage, time and duration of the outage, and shall establish reasonable means of communication to the System Users for outage related enquiries.

TDC 11. SYSTEM CONTROL

TDC 11.1 CONTROL RESPONSIBILITIES

The Network Licensee and System Users shall jointly agree and outline in writing schedules specifying the responsibilities for control of Equipment. These schedules shall ensure that only one party is responsible for any item of Plant or Apparatus at any one time.

The Network Licensee and each System User shall at all times have nominated a Control Person or persons responsible for the co-ordination of safety from the System pursuant to this Transmission and Distribution Code.

TDC 11.2 CONTROL DOCUMENTATION

The Network Licensee and Users shall maintain a suitable system of documentation which records all relevant operational events that have taken place on the System, or any other systems of System Users connected to it and the co-ordination of relevant safety precautions for work.

All documentation relevant to the Operation of the System, and safety precautions taken for work or tests, shall be retained by the Network Licensee and the appropriate System User for at least five (5) years.

TDC 11.3 SYSTEM DIAGRAMS

Diagrams illustrating sufficient information for Control Persons to carry out their duties shall be exchanged by the Network Licensee and the appropriate System User.

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TDC 11.4 COMMUNICATIONS

Where the Network Licensee reasonably specifies the need, suitable communication systems, including both verbal and data/control communication systems, shall be established between the Network Licensee and other System Users to ensure the control function is carried out in a safe and secure manner. VHF is the preferred medium of communication when performing operational activities on the System.

Where the Network Licensee reasonably decides a backup/alternative routing of communication is necessary to provide for the safe and secure Operation of the System the means shall be agreed with the appropriate System Users.

The Network Licensee shall establish the schedule and logistics for communications, including call signs or usernames for communication between the Network Licensee and the appropriate System User to enable control activities to be efficiently coordinated.

The Network Licensee and appropriate System Users shall establish 24-hour availability of personnel with suitable authorization where required by the joint operational requirements.

Where a Generator's System (or part thereof) is, by agreement, under the control of the Network Licensee, then for the purposes of communication and co-ordination in operational timescales the Network Licensee may (for those purposes only) treat that Generator's System (or part thereof) as the Network Licensee's System, but between the Network Licensee and Generator, it shall continue to be treated as the User's System. The details of this communication and coordination arrangement shall be set forth in the Interconnection Agreement and/or PPA.

TDC 11.5 COMPETENCY OF STAFF

The Network Licensee shall have in place training polices that ensure that persons operating, maintaining, testing and controlling the Network Licensee's Transmission and Distribution System are competent for the tasks to be undertaken. The policies shall include refresher training at 3-year intervals to maintain the currency of the training.

All persons operating, maintaining, testing and controlling the Network Licensee's Transmission and Distribution Systems, shall have received appropriate training to ensure competency for the tasks that they shall be undertaking and refresher training at appropriate intervals to maintain the currency of the training.

The Network Licensee shall maintain records of training given and issue certificates indicating the areas of competency of the persons trained.

TDC 11.5.1 REQUIREMENT FOR INSPECTION

All Plant and Apparatus identified to become part of the Transmission and/or Distribution System shall only become part of the Transmission and/or Distribution System following inspection and approval by the Network Licensee. The Network Licensee or System User may notify the Government Electrical Inspection Unit when such inspections shall occur, and the Government Electrical Inspection Unit may attend in its discretion.

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TDC 11.6 SWITCHING INSTRUCTIONS

For all System Control operations involving switching instructions, the Network Licensee shall establish detailed standard operating procedures controlling the activities of all party. The Network Licensee Switching Instruction systems for low voltage, medium voltage, and high voltage interconnection System Users shall be developed consistent with the requirements of TDC 8.10.1, "SWITCHING INSTRUCTIONS".

TDC 12. CONTINGENCY PLANNING

TDC 12.1 INTRODUCTION

The Network Licensee, in consultation with affected System Users, shall develop and update a comprehensive Emergency and Contingency Plan to be implemented in the event of a System Emergency or Total System Shutdown. The Network Licensee Emergency Plan shall have adequate policies and procedures in place to respond to a System Emergency or Total System Shutdown. The Network Licensee shall inform System Users of the policies and procedures of this plan through which the Network Licensee can return the System to normal operating conditions, and all System Users shall cooperate fully in their implementation.

TDC 12.2 EMERGENCY AND CONTINGENCY PLANNING

(i.) The Emergency and Contingency Plan shall include Emergency Communication Procedure to manage communication that are relevant to the performance of the Transmission and Distribution System in the event of major Outages, contingencies and other major events.

(ii.) The Network Licensee must have in place operational System Control Documents, including a Manual for Procedures for Hurricanes, in order to manage the performance of the Transmission and Distribution System under emergencies. The Network Licensee shall propose additional Documents and Manuals from time to time as needed to implement new or revised System Restoration Strategies developed under TDC 12.4, "SYSTEM RESTORATION STRATEGY." Development of these plans and strategies shall be informed by the learning of other Caribbean countries concerning planning for and recovery from extreme weather events and other disasters that damage the Grid.

(iii.) Emergency and Contingency plans shall allow for quick and orderly recovery from a partial or complete system collapse, with minimum impact on System Users

(iv.) All Emergency and Contingency plans shall be annually verified by actual tests to the greatest practical extent possible. In the event of such tests causing undue risk or undue cost to a party, the Network Licensee shall take such risks or costs into consideration when deciding whether to conduct the tests. Any tests shall be carried out at a time that is least disruptive to the parties/System Users. The costs of these tests shall be borne by the respective asset owners. The Network Licensee shall ensure the coordination of the tests in consultation with all affected parties/System

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Users.

(v.) The Network Licensee shall set the requirements and implement:
   a. Automatic and manual under frequency load shedding to maintain System stability and reliability requirements;
   b. Automatic and manual under voltage load shedding to prevent voltage collapse; and
   c. Manual load shedding to maintain System integrity.

(vi.) System Users shall make available loads and schemes to comply with these requirements.

(vii.) The Network Licensee shall be responsible for determining all operational limits on the Transmission and Distribution System, updating these periodically and making these available to the System Users.

(viii.) The Network Licensee shall conduct load flow studies as required to determine the effect that various component failures would have on the reliability of the Transmission and Distribution System.

TDC 12.3 OPERATION DURING ABNORMAL CONDITIONS

(i.) Normal operating conditions shall be defined as an operating condition where the system frequency, voltage, transmission line and equipment loading are within the range of normal operating conditions described in the GC Appendix C, "Low and High Voltage Ride-Through" table of voltage and frequency levels, and in the Interconnection Agreements and/or PPA applicable to specific Generators and System Users. The Network Licensee shall not be considered responsible for any component on the affected part of the Transmission and Distribution System being out of service due to Force Majeure conditions, or due to unplanned, unscheduled, or unauthorized Generator outages.

(ii.) Operation under abnormal conditions shall comprise all conditions deviating from normal operation.

(iii.) During abnormal operating conditions, the Network Licensee shall be obliged to take necessary precautionary measures to prevent System disturbance from spreading and to restore Supply to Customers.

(iv.) All Generators and other System Users shall cooperate with the Network Licensee in taking corrective measures in the event of abnormal conditions on the Transmission and Distribution System. The corrective measures shall include both generation -side and demand-side options. Where possible, warnings shall be issued by the Network Licensee on expected utilization of any contingency resources.

(v.) The Network Licensee shall be entitled to disrupt some sections of the System in the event of a prolonged disturbance resulting from unsuccessful corrective measures undertaken.

(vi.) The order in which emergency resources are to be used may change from time to time based on Interconnection Agreement and/or PPA provisions, the Manual Load Shedding Program, and the System Restoration Strategy and Procedures.

(vii.) Termination of the use of emergency resources shall occur as the Generation Plant supply shortage situation improves and after frequency has returned to normal in the order "last in - first out."

(viii.) During emergencies that require load shedding, the request to shed load shall be initiated in accordance with the GC 7, "Load Shedding and Power Restoration" procedures prepared by the Network Licensee.

TDC 12.4 SYSTEM RESTORATION STRATEGY

Consistent with the provisions of GC 7.7, "Contingency Plans for Power Restoration," the Network Licensee shall develop a System Restoration Strategy to be implemented in a System Emergency or Total System Shutdown. The overall objectives of the System Restoration Strategy are as follows:

(i.) Restoration of the Transmission and Distribution System and associated Demand in the shortest possible time, taking into account Generator capabilities and technical constraints, and Transmission and Distribution System operational constraints and standards;

(ii.) Resynchronization of parts of the Transmission and Distribution System which have lost synchronism with each other; and

(iii.) Effective communication arrangements throughout the System Emergency or Total System Shutdown.

The System Restoration Strategy shall provide for the detailed implementation of the following:

(i.) Notification by the Network Licensee to System Users that a Total System Shutdown or a Major System Incident has occurred and that the Network Licensee intends to implement System restoration procedures;

(ii.) Full incorporation of any Manual Load Shedding Program policies and procedures developed under GC 7.4.2, "Network Licensee Load Shedding" and GC 7.6, "Contingency Plans for Power Restoration" into the System Restoration Strategy, including the potential identification of separate groups of Generators together with complementary local Demand and the step-by-step integration of these Generators into larger subsystems to return the Transmission and Distribution System to normal operating conditions;

(iii.) Issue of any dispatch instructions necessitated by the System conditions prevailing at the time of the System Incident; and

(iv.) Planning for communications and operations to respond to a major system failure involving partial, near or Total System Shutdown for an extended period of time, such as following an extreme weather event or natural disaster, including, but not limited to, the establishment of an Emergency Operation Centre, contingency communication channels in the absence of landline or cellular phone networks, and suitable protocols for rapid decision making by the Network Licensee and System Users concerning repair and restoration of the Grid.

TDC 12.5 SYSTEM RESTORATION PROCEDURES

In the event of emergency conditions such as a Total System Shutdown of the Transmission and Distribution System, the Network Licensee shall issue an alert to notify System Users that it intends to implement System Restoration Procedures. The Network Licensee shall notify System Users prior to the commencement of the System Restoration Procedures of the particular System Restoration Strategy to be implemented for that System Incident.

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The System restoration procedures shall be developed and maintained by Network Licensee in consultation with other System Users as appropriate in accordance with Prudent Utility Practice, and the System Restoration Strategy adopted under TDC 12.4, "SYSTEM RESTORATION STRATEGY" above.

The Grid Code Review Committee shall work with the Network Licensee to ensure that appropriate System Restoration Procedures are in place.

The System Restoration Procedures shall provide for:

(i.) Procedures to establish an Emergency Operation Centre immediately following a System Emergency;
(ii.) A decision on the location of the Emergency Operation Centre; and
(iii.) The operational responsibilities and requirements of an Emergency Operation Centre, noting that such an Emergency Operation Centre shall be the focal point for communication and the dissemination of information between Network Licensee and senior management representatives of relevant System Users.

The complexities and uncertainties of recovery from a Total System Shutdown of the Transmission and Distribution System require the System Restoration Procedures to be sufficiently flexible so as to accommodate the full range of prevailing Generator and Transmission and Distribution System operational possibilities and constraints.

TDC 13. INCIDENT INFORMATION SUPPLY

The Network Licensee shall investigate any incident that materially affected interconnected Generators. These include interruptions of supply, disconnections, under or over voltage or frequency incidents, quality of supply contraventions, etc. A preliminary incident report shall be available after three working days and a final report within two months from the date of the incident. The Network Licensee shall initiate and coordinate such an investigation, arrange for the writing of the report and involve all affected parties. All these parties shall make all relevant information available to the Network Licensee and participate where reasonably required. The Network Licensee shall make the report available to the Commission with any confidential or proprietary information identified. The Network Licensee will follow the procedures set forth within the Emergency Communication Procedure – Major Outages & Events.

TDC 14. COMMUNICATIONS AND CONTROL

(i.) The Network Licensee shall update System conditions from time to time and provide a timely communication of any changes or modifications to the Transmission or Distribution System to any affected System Users.
(ii.) The Network Licensee shall be responsible for providing System Users with operational information required in the Grid Code or as may be agreed from time to time. This shall include information regarding planned and forced outages.
(iii.) The Network Licensee shall inform System Users of any System condition that is likely to impact the short and long-term operation of that System User.

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TDC 15. NUMBERING AND NOMENCLATURE OF APPARATUS

The overall objective of a numbering and nomenclature system for Network Licensee and System Users Apparatus is to ensure, so far as possible, the safe and effective Operation of the entire System and to reduce the risk of human error. The Network Licensee shall develop the system, in consultation with System Users. The System User and Network Licensee shall number and name their respective Generation, Transmission and Distribution System Apparatus located at an Interconnection Site including the Operational Interface, and all related lines and systems, in accordance with the established Network Licensee system.

The numbering and nomenclature of each item of Apparatus shall be included in the Operation Diagram prepared for each Interconnection Site. Further provisions on Operation Diagrams will be provided by the Network Licensee.

TDC 16. TESTING, MONITORING AND INVESTIGATION

TDC 16.1 INTRODUCTION

TDC 16.1.1 SCOPE

This Section TDC 16 "Testing, Monitoring and Investigation", sets out the authorization required and the procedures to be followed by the Network Licensee and System Users in conducting operational tests or Site investigations involving Plant and Apparatus connected to or part of the Transmission and Distribution System.

TDC 16.1.2 OBJECTIVES

The objectives of this TDC 16 are to ensure effective and accurate testing required to secure the stability, quality and security of the System and to plan for future System development. The Network Licensee and each System User shall endeavour to limit the frequency of operational Tests to the extent feasible and consistent with safety, and to limit the effects of such operational Tests on the Transmission and Distribution System.

TDC 16.1.3 SYSTEM TEST GUIDING CRITERIA

(i.) The Network Licensee must authorize all tests;
(ii.) The tests must be carried out in a coordinated manner to avoid unnecessary risk or damage to the Transmission and Distribution System or System User Plants, and to minimize costs to the Network Licensee and affected System Users;
(iii.) The tests may not threaten the safety of personnel or the general public;
(iv.) The tests may not threaten the security or stability of operations of the Transmission and Distribution System;
(v.) The tests must be properly evaluated upon completion and, where appropriate, subject to predefined reporting arrangements; and
(vi.) The tests must be sufficient to enable predictive fault finding.

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TDC 16.2 CATEGORIES OF TESTS

Categories of System Tests include the following:

(i.) Operational tests to commission or test the compliance of Generating Units or energy storage with the requirements of an Interconnection Agreement and/or PPA or for other purposes specified in the Generation Code.

(ii.) Site Investigation tests in relation to Plant, Apparatus and operational procedures at Generator and System User sites.

(iii.) Other tests required, in certain circumstances, whether by means of a formal test or verification by inspection, to ascertain whether Operating Parameters in this T&D Code and/or the Interconnection Agreement are being complied with in respect of the System User's Plant and Apparatus.

TDC 16.3 AUTHORIZATION AND TEST PROCEDURES

Generators shall provide notice and obtain approval from Network Licensee for all testing consistent with the requirements of GC 9, "Testing and Monitoring Procedures" prior to conducting an operational Test or Site Investigation, or other test. Customers shall provide notice to Network Licensee and follow the procedures for meter testing set forth in SC 8.2, "Code of Practice for Metering."

System Users seeking to conduct an operational Test or Site Investigation shall submit a Test Request to the Network Licensee giving at five (5) days' notice before the date of the proposed test. A Test Request shall include a detailed test proposal including:

(i.) A brief description of the proposed test;

(ii.) The preferred time or times for the test and the potential duration;

(iii.) The reason for the proposed test indicating whether the test is required for compliance with License conditions, statutory regulations or Safety Rules. This shall assist in determining the priority to be given to the test;

(iv.) An indication of any potential adverse effects if the Test is cancelled at short notice or delayed; and

(v.) An indication of any Dispatch Instructions or operational switching required to facilitate the test.

The System User is required to check resource conditions three (3) business days prior to the scheduled date of the Test(s) to be carried out and provide this information to the Network Licensee. Insufficient resource availability may lead to the cancellation of the Test up to one (1) business day prior to testing.

On the day of the Test, the System User should contact the Network Licensee designated contact at least thirty (30) minutes prior to the agreed start time to confirm that personnel on site will be ready to begin testing. The Network Licensee designated contact will liaise with the operators and personnel on site to coordinate testing, and shall provide additional dispatch support and coordination personnel if required to support complex testing, consistent with Generation Code dispatch provisions.

The Network Licensee shall consider the following factors when evaluating a Test Request:

(i.) The impact of the requested test on the Transmission and Distribution System stability and security;

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(ii.) The impact of the requested test on the Transmission and Distribution System economics;
(iii.) The impact of the requested test on other System Users; and
(iv.) The effect of the requested test on the continuity and quality of electricity Supply.

If the Network Licensee approves a Test Request, it shall inform the test proposer accordingly in writing.

If the Network Licensee requests additional information from the test proposer to evaluate the impact of a Test Request the Network Licensee shall stipulate the reasonable time within which the information shall be provided. If the information is not provided in the timescale indicated by Network Licensee, the Test Request shall automatically lapse.

If the Network Licensee does not approve a Test Request, it shall set out its reasons for rejecting the application and consult with the Test proposer on any changes to the Test proposal required to secure approval for the Test. The Test proposer may update a Test proposal in accordance with guidance provided by the Network Licensee and submit a revised Test Request.

The Network Licensee shall not withhold approval of a Test Request unless it considers it has reasonable grounds for doing so. If a System User is not satisfied that a Test request was rejected on reasonable grounds it can refer the matter to the Commission for determination.

The Network Licensee shall not disclose any information received as part of a Test Request application without the consent of the System User who submitted the Test Request if the applicant has requested that the information be treated as confidential, and if the information is commercially sensitive.

The Network Licensee shall inform other System Users of the scheduled time and nature of the test, if in the opinion of Network Licensee those System Users will or may be affected by the test.

TDC 16.4 TEST PANEL

If a Test Request is approved, the Network Licensee shall decide if the complex or novel nature of the requested test justifies the use of a Test Panel to review the testing protocol, implementation and analysis. If the Network Licensee decides that a Test Panel is required, the test proposer shall convene a Test Panel, subject to the approval of the Network Licensee. The number of Test Panel members shall be kept to the minimum number of persons compatible with affected System User representation.

The Chairman of a Test Panel shall be appointed by the Network Licensee. The Network Licensee and all directly affected System Users shall be represented on the Test Panel.

The duties and responsibilities of the Test Panel are as follows:
(i.) To prepare a detailed program for the conduct of the test, including the start and end date of the test, and any Dispatch requirements and operational switching required to facilitate the test;
(ii.) To identify the detailed management requirements of the test;

(iii.) To ensure that all affected Parties are properly informed of and have access to all relevant information;
(iv.) To schedule the resources required to conduct the test;
(v.) To analyse the implications of the test results; and
(vi.) To prepare a Test Document that shall include all the elements listed above.

The Test Document shall be copied to all members of the Test Panel at least two (2) weeks before the start date of the test. Members of the Test Panel may provide comments on the Test Document to the Chairman of the Test Panel no later than one (1) week before the scheduled start date of the Test.

The test shall proceed only on the condition that the Test Panel has approved the Test Document. If a member of the Test Panel is not satisfied with the test proceeding, they must raise their concerns with the full Test Panel and seek to resolve the issue by consensus, but if their concerns are not adequately addressed by the Test Panel review, the member may file a request with Commission to resolve the issue using dispute resolution procedures.

The Network Licensee shall not disclose information provided to a Test Panel without the consent of the submitter (whether applicant or member of the Test Panel) if the submitter has requested that the information be treated as confidential, and if the information is commercially sensitive.

TDC 16.5 POST TEST REPORTING REQUIREMENTS

At the conclusion of an operational Test or Site Investigation for Generating Units, the test proposer shall prepare a preliminary report on individual test results within 48 hours, and a written report on the test within a reasonable time of the test being conducted, as set forth in GC 9.3.5, "Individual Test Results" and GC 9.3.6, "All Test Results." The report shall be copied to the Network Licensee and the Commission. Any meter testing shall be shared with the Network Licensee within the same timeframes.

The Test Report shall not be submitted to any other person who is not a representative of the Network Licensee or the test proposer unless the Network Licensee and the test proposer having reasonably considered the confidentiality issues arising and shall have unanimously approved such submission.

The Test Report shall include a detailed description of the completed Test, the Plant or Apparatus to which the Test relates, together with the results, conclusions and recommendations as they relate to the Test proposer, Network Licensee and all Users operationally affected by the Test, where applicable.

The Test Panel shall disband after the Commission has received the final Test Report unless the Commission requests a further submittal from the Test Panel.

TDC 16.6 OPERATIONAL TESTS REQUIRED BY THE NETWORK LICENSEE

The Network Licensee may from time to time need to conduct operational Tests in order to maintain and develop operational procedures, to train staff, and to acquire information concerning Transmission and Distribution System performance.

Where the Network Licensee intends to carry out an operational Test and in the Network Licensee's reasonable opinion, such a test will or may have an operational effect on a System User's System, the Network Licensee shall give 5 days' notice and provide sufficient information to the affected Users to enable the affected Users to assess any risks to their Systems.

The information provided by Network Licensee shall include;

(i.) A brief description of the operational Test;
(ii.) The probable effects of the operational Test; and
(iii.) The scheduled time and duration of the operational Test.

Affected System Users must promptly contact the Network Licensee to request additional time or information to consider the impact of the operational Test on their Systems.

TDC 16.7 SITE INVESTIGATION TESTS

The Network Licensee may, if it reasonably considers that there may be an issue of non-compliance with an agreement by the System User, carry out a Site Investigation to acquire or verify information relevant to System Users Plant and/or Apparatus design, Operation or Interconnection requirements under the Transmission and Distribution Code, Interconnection Agreement and/or PPA, or other agreements between System Users and the Network Licensee.

The Network Licensee may, having given reasonable notice, send a representative or agent to a System User's site in order to investigate any equipment or operational procedure applicable to the System User site insofar as the condition of that equipment or operational procedure is relevant to compliance with this Transmission and Distribution Code, an Interconnection Agreement, or other relevant agreements.

TDC 16.8 OTHER TESTS

The Network Licensee can, at any time, request a Test. The Network Licensee and the System User may establish specific Test procedures in an Interconnection Agreement and/or PPA which shall control the Tests over these general provisions.

Testing, including Tests carried out under any relevant agreement may involve attendance by the Network Licensee or their representatives at System User sites in order to carry out or observe such Tests.

Where required, a Test shall be carried out in accordance with Dispatch Instructions and operational switching instructions issued by the Network Licensee or by such alternative procedures as is required or permitted by the Transmission and Distribution Code.

Where a Test is required at short notice, the Network Licensee shall use reasonable endeavours to accommodate the Test in the requested timescale, except that the Network Licensee may decline the Test if there is a reasonable basis to conclude that the Test would compromise the security and stability of the Total System, would pose a risk to the safe and secure Operation of Plant, or would compromise the safety of personnel or the general public.

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TDC 17. TRANSMISSION AND DISTRIBUTION METERING

TDC 17.1 PURPOSE

This section TDC 17 "Transmission and Distribution Metering" sets out general guidance for the manner in which power and energy flows are measured at an operational Interface on the Transmission and Distribution System for System Users. These provisions shall be read together with and consistently with the metering provisions applicable to consumers under SC 8, "Metering and Billing," which address meters measuring the Service of Supply, and GC 4, "Generation Operational Metering."

These general standards shall guide the Network Licensee in development of a Code of Practice for Transmission and Distribution Metering that provides detailed guidance to System Users. If agreed with the Commission, the Network Licensee may combine this Code of Practice with the GC 4.2.1, "Code of Practice for Generation Metering" and SC 8.2, "Code of Practice for Metering.", provided that any revisions required in the other codes to allow this combination is done and approved accordingly.

TDC 17.2 SCOPE AND POLICY

TDC 17.2.1 SCOPE

This section TDC 17 applies to both the Network Licensee and all System Users.

TDC 17.2.2 POLICY

The general policy of Transmission and Distribution Metering shall be:

1) All power and energy flows at the operational Interface on the Transmission and Distribution System are to be recorded by primary meters supplied and maintained by the Network Licensee or by back-up meters supplied by the System User consistent with GC 4, "Generation Operational Metering" and with SC 8, "Metering and Billing."
2) All meters deployed by the Network Licensee or used in System User Installations must be certified in accordance with this T&D Code and comply with the requirements established in the applicable Code of Practice.
3) The Network Licensee may enter into an agreement with the Grenada Bureau of Standards, or another entity approved by the Commission to provide for certification and/or independent testing of meters.
4) Where electricity is supplied through a certified meter, the register of the meter will be evidence of the quantity or time of power or energy flows unless there is evidence to the contrary.
5) Large Customers, Generators with Licenses, and Self-Generator Permit Holders with interconnections of 1MW or greater to the Transmission and Distribution System shall be required to install metering systems with remote reading capability and provide the Network Licensee with access to the system data in real time.
6) For clarity, Small Renewable Energy Self-Generators are subject to the provisions of the Code of Practice for Small Renewable Energy Self-

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Generators as provided in GC 3.12.4.1, “Metering Requirements.”

TDC 17.2.3 BILLING RECORDS

Each System User shall be provided with access to its billing and consumption records upon request to the Network Licensee.

TDC 17.3 METERING REQUIREMENTS – GENERATORS

All Generators, except a Self-Generator who is not interconnected to the Grid and who is exempt from licensing or permit requirements under Section 13 of the Act, shall be controlled by the Metering requirements of GC 4, “Generation Operational Metering.”

Generators shall install Adequate Metering Systems consistent with the technical specifications of this TDC 17 and GC 4, “Generation Operational Metering.”. The Metering System shall comprise a Primary and Backup Metering System and shall be designed, financed and installed by the Generator. The Network Licensee shall own and maintain the Primary Metering System while the Generator shall own and maintain the Backup Metering System.

TDC 17.4 METERING REQUIREMENTS – CUSTOMERS

TDC 17.4.1 CUSTOMER METERING REQUIREMENTS

All consumers connected to the Distribution System and subject to SC 8, “Metering and Billing”, shall be controlled by those Metering requirements in the Supply Code of this Grid Code.

TDC 17.4.2 METERING STANDARDS AND SPECIFICATIONS

The meters shall be designed, constructed and operated to comply with the latest revision of the relevant ANSI standards or international equivalents in particular:

(i.) ANSI C12.1 2008 The Electric Meters code for Electricity Metering;
(ii.) ANSI C12:10 2004 Physical aspects of watt-hour meters - safety standard; and
(iii.) ANSI C12:20 2002 Electricity meters 0.2 and 0.5 accuracy Classes.

TDC 17.4.3 CALIBRATION AND SEALING

The Network Licensee shall develop a procedure for calibration of new and repaired meters under the GC 4.2, Network Licensee Obligations Concerning Generation Metering” and SC 8, “Metering and Billing.”

TDC 17.4.4 MAINTENANCE POLICY

The Network Licensee Code of Practice for Metering shall include a policy for the inspection and testing and recalibration of all metering Equipment consistent with the general guiding provisions of TDC 17, “TRANSMISSION AND DISTRIBUTION METERING”.

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TDC 17.4.5 MAINTENANCE RECORDS

The Network Licensee shall keep all test results, maintenance program records and sealing records.

TDC 18. TRANSMISSION AND DISTRIBUTION SYSTEM DATA REGISTRATION

TDC 18.1 GENERAL

This section TDC 18 "Transmission and Distribution System Data Registration". Defined the Data Registration Requirements, where each item of data is allocated to one of three categories:

(i.) System Planning Data as required by the Planning section TDC 3 and the Interconnection section TDC 5 of this Transmission and Distribution Code;
(ii.) Generation Planning Data as required by the Generation Code; or
(iii.) Operational Data as required by the Network Licensee and as required from Generators in accordance with the Scheduling and Dispatch provisions of the Generation Code.

TDC 18.2 PROCEDURES AND RESPONSIBILITIES

TDC 18.2.1 RESPONSIBILITY FOR SUBMISSION AND UPDATING OF DATA

In accordance with the provisions in the various sections of this Transmission and Distribution Code, each System User must submit data as requested by the Network Licensee.

TDC 18.2.2 METHODS OF SUBMITTING DATA

The System User must submit data to the Network Licensee. The name of the person at the System User who is submitting each schedule of data must be included. The data may be submitted electronically consistent with the specifications established by Network Licensee with written consent of the Network Licensee.

TDC 18.2.3 CHANGES TO SYSTEM USERS' DATA

The System User must notify the Network Licensee of any change to data already submitted and registered with the Network Licensee, in accordance with each section of this Transmission and Distribution Code.

TDC 18.2.4 DATA NOT PROVIDED

If a System User fails to provide data when required by any section of this Transmission and Distribution Code, the Network Licensee may report the failure of cooperation to the Commission and shall estimate such data when, in the view of the Network Licensee, it is necessary and feasible to do so. The Network Licensee shall advise the System User in writing of any estimated data it intends to use relating directly to that System User Plant and/or Apparatus in the event of data not being provided.

If the Network Licensee fails to provide data when required by any section of this Transmission and Distribution Code, the System User to whom that data ought to have

been provided, may report the failure of cooperation to the Commission and shall estimate such data if and when, in the view of that System User, it is necessary to do so. The System User shall advise the Network Licensee in writing of any estimated data it intends to use in the event of data not being s provided.

Such estimates shall, in each case, be based upon data provided previously for the same Plant or Apparatus or upon corresponding data for similar Plant and/or Apparatus or upon such other information as the Network Licensee or the relevant System User, as the case may be, deems appropriate.

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