JAMAICA ELECTRIC UTILITY SECTOR

INTRODUCTION TO BOOK OF CODES

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The data, conclusions and recommendations will remain draft until the documents have gone through the review process and is approved by the legally authorized entities.

INTRODUCTION TO CODES REVISIONS

LIST OF REVISIONS

Current Rev.	Date	Page affected	Prepared by	Checked by (technical)	Checked by (quality assurance)	Approved by
			REVISION HISTORY			
		All				

Table of Contents

IC 1 INTRODUCTION TO CODES

This Introduction and each of the Codes comprise the substance of the Book of Codes. The Codes are organized into a single Book of Codes for the convenience of the System Users and it allows a more convenient reference to related provisions in the other Codes. The Introduction provides background information which places the Codes in context; an overview of the legal authority for the Codes; sets out the organization of the Book of Codes; guidance on interpretation of the Codes; and defines the Terms and Definitions applicable to the Codes.

IC 1.1 Market Design and Structure

The electricity sector in Jamaica is organized around a single utility company, JPS. JPS is a vertically integrated electricity company in operation for over ninety years.

The company was granted a licence by the Government of Jamaica in 2001, the All-Island Electric Licence, 2001 and this Licence was amended and restated in 2011 as the Amended and Restated All-Island Electric Licence, 2011. The amended and restated Licence was further amended in 2016 and promulgated as the Electricity Licence. According to the Electricity Licence, JPS holds a monopoly on transmission and distribution of electricity to its customers. JPS is authorized to generate, transmit, distribute and supply electricity for public and private purposes within Jamaica subject to certain conditions set out therein.

Between 2001 and 2004 under the licence it held then, JPS had an exclusive licence for the development of new generation capacity. Since 2004, independent power producers (IPP) are allowed to compete for long-term contracts to generate electricity and sell it to JPS. In addition to JPS and IPPs, the Governments Rural Electrification Program (REP) provides electricity in remote areas where electrification is not commercially viable.

Over the years, through the expansion of its generation, transmission and distribution capabilities, JPS has grown from a modest network serving fewer than 4,000 customers in the early years, to now serving a customer-base of over 603,000. The company has generation capacity exceeding 620 MW, using steam (oil-fired), gas turbines combined cycle, diesel and hydroelectric technologies. JPS operates twenty-four (24) generating units including nine (9) hydro power plants and one wind farm. JPS also purchases electricity from four (4) IPPs under long-term Power Purchase Agreements (PPAs). The company also owns fifty-two (52) substations and approximately 16,000 kilometres of distribution and transmission lines.

This dominance of JPS and the small number of IPPs demonstrates that there is little competition in the electricity generation sector, especially considering JPS' control of the Grid.

Since 2001 when JPS was first privatized, the company has accepted several external stakeholders. At the moment, JPS is owned by four (4) shareholder groupings: Marubeni Caribbean Power Holdings Inc. and Korea East-West Power Co. Ltd., each holding 40%; the GOJ which owns approximately 19.9% and a small group of minority shareholders, owning 0.1% stake.

The company reported a staff complement of approximately 1,600 workers delivering service to its customers. JPS is regulated by the OUR pursuant to the Electricity Act and the Electricity Licence.

Under the Electricity Act, the Single Buyer, currently JPS, functions as the system operator transmitting, distributing and selling electricity to consumers. JPS also purchases electricity from Independent Power Producers (IPP) through power purchase agreements as well as self-generators under net billing arrangements. JPS as the Single Buyer and System Operator are required to maintain separate accounts for its generation, transmission, distribution, and supply activities as well as all revenues, costs, profits, or losses resulting from other business activities.

IC.1.1 Purpose of the Codes

These Codes covers the guiding principles, operating procedures, and Technical Standards governing operation of the Grid and all interconnected Generating Facilities.

The Codes have been developed in parallel, designed to provide a comprehensive framework for the development, maintenance and operation of an efficient, safe, and reliable Grid. Each of the five Codes that is the Generation, Transmission, Distribution, Supply, and Dispatch Codes, is designed to be used in conjunction with the other four Codes. The Codes cover all material technical aspects relating to connection to, Operation, and use of the System (and insofar as they affect the System, the Operation of User electric lines and electrical Plant connected to that System). The Codes prohibit any undue discrimination among Users and categories of Users of the Grid. The Codes also provide technical guidance to all Users in relation to the optimal approach to planning, operation and use of the power Grid. The Codes have been designed to be consistent with internationally required technical standards and with Prudent Utility Practice, and to address the specific needs of the Grid and its Users.

The Codes are authorized by and enforceable under the provisions of the Electricity Act, the Office of Utilities Regulation Act as well as the Electricity Licence. The Codes will supersede all existing codes pertaining to the electricity sector.

The Codes have been developed in extensive consultation with the Users of the Grid, and with the Ministry responsible for energy. The Codes repeal the existing Generation Code and replaces it with a Book of Codes with detailed provisions.

IC 2 LEGAL AUTHORITY FOR PROMULGATION OF CODES

IC 2.1 Electricity Act, 2015

Section 47 of the Electricity Act requires that OUR, with the approval of the Minister responsible for energy, prepare and promulgate the Codes listed therein within twelve months after the August 27, 2015. The Codes are defined in section 2 of the Electricity Act as the Generation Code, Transmission Code, Distribution Code, Supply Code and Dispatch Code. The Codes are to provide general direction to electricity sector licensees and the Dispatch Code, in particular, must contain a process for Office investigation of any significant power outage. Section 47 of the Electricity Act further provides that a breach of the Codes by a licensee constitutes a breach of the electricity licence held by the licensee (licensee that existed prior to August 27, 2015, the effective date of the Electricity Act are excluded). Also, any breach of the Codes by a licensee or a self generator who is not a licensee shall constitute an offence under the Electricity Act. The OUR through the consultative process with electricity sector stakeholders must review the Codes at least every three years and publish the same.

In discharging this responsibility, generally the OUR takes guidance from the objectives set forth in section 3 of the Electricity Act, and specifically the following objectives: (1) the provision of a modern system of regulation of the generation, transmission, distribution, supply , dispatch and use of electricity; (2) the promotion of clarity in relation to the respective roles and responsibilities of the stakeholders in the electricity sector; (3) facilitation of an efficient, effective, sustainable and orderly development and operation of the electricity supply infrastructure, supported by adequate levels of investment; (4) promotion of energy efficiency and the use of renewable and other energy sources; (5) prescription of the required standards in the electricity sector; (6) protection and safety of consumers of electricity and the public; and the ensuring transparent and predictable regulation of the electricity sector.

IC 2.2 The Office of Utilities Regulation Act

Section 4(1)(a) of the OUR Act charges OUR with the function of regulating the provision of prescribed utility services by licensees or specified organizations. In the absence of provisions in the Electricity Act and the Electricity Licence,

the OUR Act prescribes the manner in which the OUR must operate in carrying out its functions and the exercise of its powers. Section 4(3) of the OUR Act provides that in undertaking its functions, OUR shall undertake such measures as it considers necessary or desirable to:

I. encourage competition in provision of prescribed utility services;
II. protect the interests of consumers in relation to the supply of a prescribed utility service;
III. encourage the development and use of indigenous resources;
IV. promote and encourage the development of modern and efficient utility services; and
V. enquire into the nature and extent of the prescribed utility services provided by licensees or specified organizations.

IC 3 PREVIOUS CODES

The OUR, in the past, has promulgated codes, which provided guidance to licensees on the rules and procedures designed to assure a secure and reliable supply of electricity with the most recent being the Electric Utility Sector Generation Code, July 2013 (Document No. 2013/003/ELE/TEC/001).

In addition, JPS, working with a Code Review Panel of stakeholders, produced a proposed draft of a Transmission Grid Code and a Distribution Grid Code in 2011, pursuant to All-Island Electric Licence, 2001. These draft codes, combined with then existing Generation Code, provided the foundation for the development of these Codes. Appropriate revisions were made to the draft codes to reflect the requirement of Electricity Act to promulgate the Codes, and the input from electricity sector stakeholders was sought and provided during extensive consultations.

The Codes repeal the existing Electric Utility Sector Generation Code and the content of the Codes draws upon all prior development work of the draft codes to promulgate an integrated and comprehensive Book of Codes.

IC 4 OVERVIEW OF THE CODES

In brief, the Generation Code covers the Generator Connections to the Transmission or Distribution Systems. The responsibility boundary between the Generator and the System Operator will normally be the High Voltage side of the Generating Unit transformer. The Transmission Code covers the Transmission System including electric power lines operating at 690 kV and above (including 138kV and 69kV systems) and including the secondary circuit breakers and up to the outgoing Isolators at Transmission Substations transforming to 24kV, 13.8kV and 12kV. The Distribution Code covers the Distribution System from the point of the outgoing isolators on the Transmission Substations as described above, to the point of connection with the Customers system. The Supply Code covers the sale of electricity to

customers by the Supply licensee. The Dispatch Code controls the Dispatch licensee in activities involved in the central management and direction of generation plants and other sources of supply to the Grid. The diagram set forth in Figure 1 below illustrates the various boundaries.

In the Codes, JPS has responsibilities in two distinct capacities, they are as follows:

a. JPS is responsible for prudent and efficient management of the System by virtue of its holding of the Licence. This Code applies the term "Grid Operator" whenever referring to JPS in this capacity; and
b. As the owner of power stations, JPS is also subject to the rights and obligations in this regulation as it applies to Generators, and any reference to "Generators" in this regulation should be interpreted to include JPS in this capacity.

Given Jamaica's high dependence on petroleum-based fuels for electrical energy requirements and its susceptibility to fuel price volatility, it is important that the country achieves its energy diversifications objectives in the medium to long term, taking into account, economic cost, efficiency, environmental considerations and appropriate technologies. The Codes therefore introduce detailed provisions to assure the smooth integration of the renewable energy and energy efficiency initiatives envisioned by the National Energy Policy 2009-2030. The provisions are designed to enable achievement of the Policy goal of 20% renewable energy contribution to the country's energy sources by 2030, and the informal target of 30% renewable energy generation sources for the electricity sector by 2030 while maintaining a safe, secure, stable and reliable grid. These renewable energy and energy efficiency integration provisions address minimum technical conditions for the integration to the System of renewable energy generation sources in line with international best practices and standards, planning and operational responsibilities and requirements related to feasibility studies and system studies. These requirements will evolve with time, to respond to technological advances and to support increasingly higher levels of renewable energy penetration and innovative use of energy efficiency initiatives."

IC 4.1 Generation Code

The Generation Code governs Generation activities in the electricity sector. The Generation Code covers the guiding principles, operating procedures and technical standards governing all generating Ffacilities interconnected to the Grid. The Generation Code seeks to facilitate the economic, safe and reliable operation of the Grid. The Generation Code facilitates the System being made available to persons authorised to generate electricity and to interconnect with the System, and is conceived as a statement of what is optimal

(particularly from a technical point of view) for all Users and the System Operator itself in relation to the planning, operation and use of the System. It seeks to avoid any undue discrimination between Users and categories of Users.

The Generation Code is divided into the following sections:

SECTION 1 SCOPE

SECTION 2 INTERCONNECTION CONDITIONS

Specifies the normal method of connection and the minimum technical, design and operational criteria which must be complied with by all Generators and prospective Generators.

SECTION 3 OPERATIONAL METERING

Specifies the Technical Standards and procedures for metering applicable to Metering Systems installed by Generators.

SECTION 4 MERIT ORDER SYSTEM

Specifies the requirement of the System operator to establish a Merit Order system based on the real or contracted Variable Operating Cost component of each Generating Unit or Complex

SECTION 5 SCADA INTERFACING

This Section sets out the technical requirements for connections to the Operator's Supervisory Control and Data Acquisition (SCADA) system outstation in terms of electrical characteristics.

SECTION 6 COMMUNICATION AND REPORTING

Sets out the requirement of a Generator to provide information as requested, pertaining to the operation of their Generating Unit(s).

SECTION 7 Fuel Supply Agreement

Specifies the minimum requirement of the Generator Fuel Supply Agreement.

SECTION 8 GENERATIOR SCHEDULING AND DISPATCHING TOOLS

Specifies the procedures for Generating Unit scheduling, dispatch, System security and communications between Generators and The System Operator via the System Control Centre.

SECTION 9 NEW TECHNOLOGIES

Makes provision for new technologies that have parameters not covered by the Code which may be given consideration for inclusion to the System

SECTION 10 GENERATOR MAINTENANCE PLANNING

Specifies the criteria and procedures governing the planning and scheduling of maintenance requirements of generators' generating facilities.

SECTION 11 SCHEDULES OF RESPONSIBILITIES

Specifies the ownership and the responsibilities for Operation an Maintenance which shall be jointly agreed by the System Operator and the appropriate Generator for each location

SECTION 12 TESTING AND MONITORING

Specifies the list, timetable and procedures for all tests to be performed by the Generator and System Operator.

SECTION 13 MONITORING AND CONTROL

Specifies the method of monitoring and controlling of the system by the system operator, and the method by which the system operator and Users can communicate with each other as well as exchanging data signals for the monitoring and control of the system.

SECTION 14 UNFORESEEN CIRCUMSTANCES

Makes provisions for circumstances which may arise and which are not addressed by the Code.

SECTION 15 GENERATION INTERCONNECTION STUDIES

Specifies the type of studies required to be carried out by Users and potential Users of the system who require to connect generator to the system.

IC 5.1 Transmission Code

[1] The Transmission Code applies to the conveyance of electricity by means of the Transmission System, which includes electric power lines operating at 69kV and higher, including the secondary circuit breakers and up to the outgoing Isolators at Transmission Substations transforming to 24kV, 13.8kV and 12kV. The Transmission Code provides the guidelines controlling the development, maintenance and operation of an efficient, co-ordinated and economic Transmission System in Jamaica. The Transmission System being made available to persons authorised to supply or generate electricity and is conceived as a statement of what is optimal (particularly from a technical point of view) for all Users and the System Operator itself in relation to the planning, operation and use of the Transmission System. It seeks to avoid any undue discrimination between Users and categories of Users.

[2] The procedures and principles governing the System Operator's relationship with all Users of the Transmission System are set out in the Transmission Code. The Transmission Code specifies day-to-day procedures for both planning and operational purposes and covers both normal and exceptional circumstances.

[3] The Distribution Code will cover the System from the point of the outgoing isolators on the Transmission Substations as described above, to the point of connection with the Customer's system.

[4] The Generation Code covers the Generator Connections to the Transmission or Distribution Systems. The responsibility boundary between the Generator and the System Operator will normally be the High Voltage side of the Generating Unit transformer. The diagram set forth in Figure 1 describes the boundaries among the various Code jurisdictions.

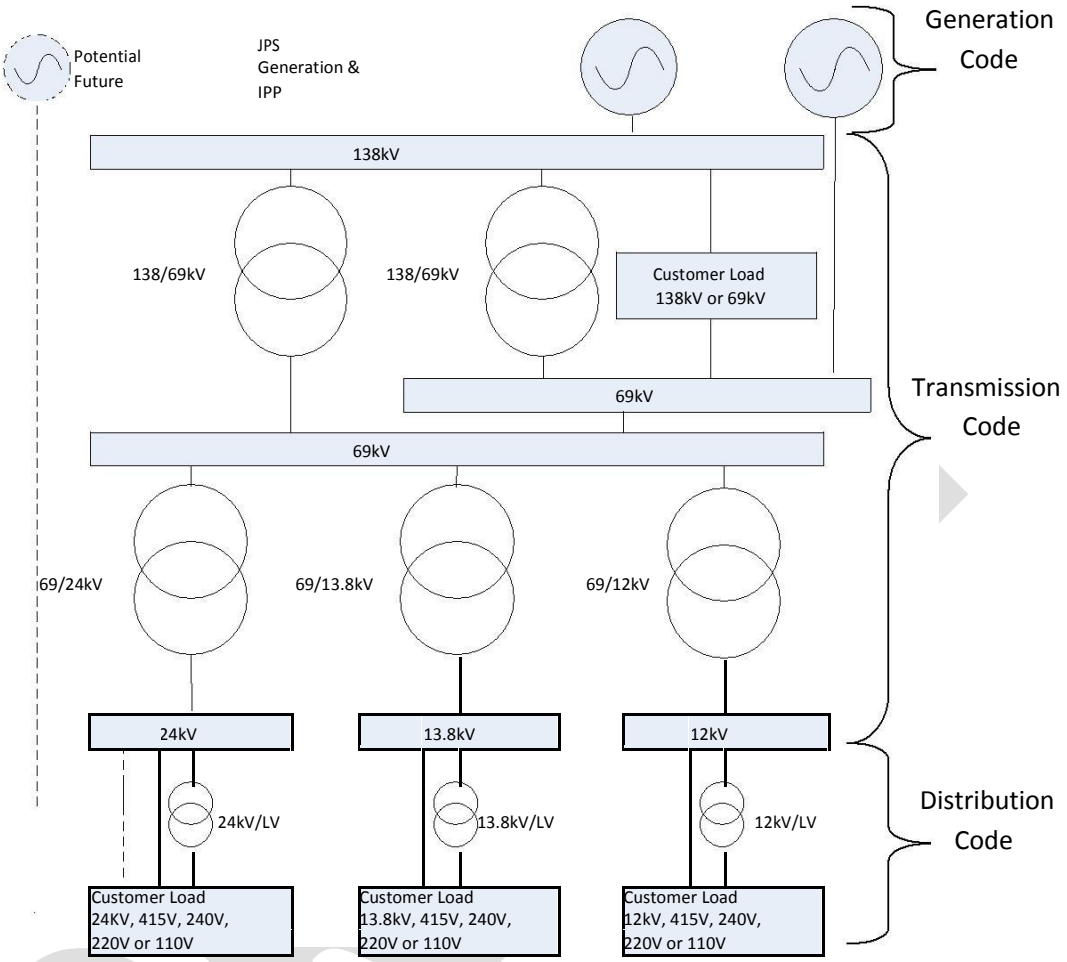

Figure 1. Boundaries between the Transmission, Distribution and Generation Codes

The Transmission Code is divided into the following sections:-

SECTION 1 SCOPE
SECTION 2 GENERAL REQUIREMENTS

This is intended to ensure, so far as possible, that the various sections of the Transmission Code work together and work in practice

SECTION 3 TRANSMISSION PLANNING

Sets out responsibility of the Minister for planning the development of the System, the planning process for transmission and distribution, consider the location of renewable and other generation sources, taking into account the potential for electrification of rural areas.

SECTION 4 MAINTENANCE STANDARDS

Specifies the maintenance standards that All Plant and Apparatus on the System shall be operated and maintained in accordance with Prudent Utility Practice and in a manner that shall not pose a threat to the safety of employees or the public.

SECTION 5 TRANSMISSION INTERCONNECTION

Specifies the normal method of Interconnection to the Transmission System and the minimum technical, design and operational criteria which must be complied with by any User or prospective User

SECTION 6 POWER QUALITY STANDARDS

Specifies the quality standards of the voltage, including its frequency and the resulting current, that are measured in the Transmission System during normal conditions and contingency conditions.

SECTION 7 PLANT AND APPARATUS RELATING TO INTERCONNECTION SITES

Specifies the conditions that all Plant and Apparatus relating to the User/System Operator at the Interconnection Point, shall be compliant with.

SECTION 8 SITE RELATED CONDITIONS

Specifies the responsibility for site safety, responsibility schedules, and operations related matter at owner site.

SECTION 9 OPERATIONAL COMMUNICATIONS

Sets out the requirements for the exchange of information in relation to Operations on the Transmission System which have had (or may have had) or will have (or may have) an Operational Effect.

SECTION 10 DEMAND CONTROL

Specifies the provisions made by the System Operator and procedures to be followed by the System Operator and 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 System

SECTION 11 SYSTEM CONTROL

Sets out the System Control responsibilities, control documentation, system diagram and communications.

SECTION 12 CONTINGENCY PLANNING

Specifies the requirement of the System Operator to develop a strategy to be implemented in Emergency Conditions of a Major System Failure.

SECTION 13 INCIDENT INFORMATION SUPPLY

Specifies the requirement of the System Operator and Generators to issue notices of all Incidents on their respective Systems that have or may have implications for the Transmission System or a User's System.

SECTION 14 COMMUNICATIONS AND CONTROL

Specifies the telecommunications requirements between Users and the System Operator which must be established if required by the System Operator.

SECTION 15 NUMBERING AND NOMENCLATURE

Sets out the requirement for numbering and nomenclature that must be used for Transmission Apparatus on Users' Sites and User Apparatus on Transmission Sites.

SECTION 16 TESTING, MONITORING AND INVESTIGATION

Sets out the authorization required and the procedures to be followed by the System Operator, and Users wishing to conduct Operational Tests or Site Investigations involving Plant and Apparatus connected to or part of the Transmission System.

SECTION 17 TRANSMISSION METERING

Sets out the way in which power and energy flows shall be measured at an Operational Interface.

SECTION 18 TRANSMISSION SYSTEM DATA REGISTRATION

Table provides details of the Schedules covering the data to exchanged between the System Operator and the Users of the Transmission System

IC 6.1 Distribution Code

[1] The Distribution Code governs the distribution system and activities related thereto. It is designed to (a) permit the development, maintenance and operation of an efficient, co-ordinated and economic Distribution System in Jamaica; and (b) facilitate the Distribution System being made available to persons authorised to supply or generate electricity. The Distribution Code is conceived as a statement of what is optimal (particularly from a technical point of view) for all Users and the System Operator itself in relation to the planning, operation and use of the Distribution System. It seeks to avoid any undue discrimination between Users and categories of Users.

[2] The procedures and principles governing the System Operator's relationship with all Users of the Distribution System are set out in the Distribution Code. The Distribution Code specifies day-to-day procedures for both planning and operational purposes and covers both normal and exceptional circumstances.

[3] The Distribution Code will cover the Distribution System from the point of the outgoing isolators on the Transmission Substations as described above, to the point of connection with the Customers system.

The Distribution Code is divided into the following sections:

SECTION 1 SCOPE

SECTION 2 GENERAL REQUIREMENTS

General Requirements which are intended to ensure, so far as possible, that the various sections of the Distribution Code work together with the other four Codes

SECTION 3 DISTRIBUTION PLANNING

Sets out the responsibility of Minister for planning the development of the system, which planning including further requirements that the planning process for distribution, considers the location of renewable and other generation sources, taking into account the potential for electrification of rural areas

SECTION 4 EMBEDDED GENERATION

Specifies the data requirements required from Embedded Generators to assess the impact that the Embedded Generator will have on the Distribution System.

SECTION 5 DISTRIBUTION INTERCONNECTION

Specifies the normal method of interconnection to the Distribution System and the minimum technical, design and operational criteria which must be complied with by any User or prospective User.

SECTION 6 POWER QUALITY STANDARDS

Specifies the quality of the voltage, including its frequency and the resulting current that is measured in the Distribution System during normal conditions and contingency conditions.

SECTION 7 PLANT AND APPARATUS RELATING TO INTERCONNECTION SITES

Specifies the requirements for all Plant and Apparatus relating to the Users/System Operator at the Interconnection Point to be compliant with the provisions of the Code.

SECTION 8 SITE RELATED CONDITIONS

Specifies the responsibilities of the Parties and requirements for safety, responsibility schedules, and operational requirements

SECTION 9 COMMUNICATIONS AND CONTROL

Sets out the telecommunication requirements between User(s) and the System Operator which must be established if required by the System Operator to ensure control of the Distribution System.

SECTION 10 TESTING AND MONITORING

Specifies the requirement to test and/or monitor the Distribution System to ensure that Users are not operating outside the technical parameters required by this Code.

SECTION 11 DEMAND CONTROL

Specifies the provisions to be made by the System Operator or a User with Systems connected to the Distribution System, in certain circumstances, to permit reductions in total Demand in the event of insufficient Generating Plant being available to meet total Demand

SECTION 12 OPERATIONAL COMMUNICATION

Sets out the requirements for the exchange of information in relation to Operations and/or Incidents on the Distribution System or any User System connected to the Distribution System which have had, may have had, will have or may have an Operational Effect on the Distribution System or any other User System.

SECTION 13 MAINTENANCE STANDARDS

Sets out the requirements for maintenance of all Plant and apparatus on the System including maintenance standards, maintenance policy and maintenance records.

SECTION 14 COMPETENCY OF STAFF

Sets out the requirement for the System Operator to have in place training polices that serve to ensure that persons operating, maintaining, testing and controlling the System Operator Transmission and Distribution Systems are competent for the tasks to be undertaken

SECTION 15 SWITCHING INSTRUCTIONS

Specifies the requirement for switching on the Distribution System.

SECTION 16 NUMBERING AND NOMENCLATURE

Sets out the responsibilities and procedures for notifying the relevant owners of the numbering and nomenclature of Apparatus at Interconnection Points.

SECTION 17 SPECIAL SYSTEM TESTS

Sets out the responsibilities and procedures for arranging and carrying out Special System Tests which have or may have an effect on the System Operators Distribution System or Users Systems

SECTION 18 DISTRIBUTION METERING

Specifies the requirements for metering the Active and Reactive Energy and Demand input to and/or output from the Distribution System;

SECTION 19 DISTRIBUTION DATA REGISTRATION

Sets out a unified listing of all data required by the System Operator from Users and by Users from the System Operator.

IC 7.1 Dispatch Code

[1] The Dispatch Code governs the Dispatch activities of the System Operator. The Dispatch Code is designed to (a) permit the development, maintenance and operation of an efficient, co-ordinated and economic Grid; and (b) facilitate the Transmission and Distribution Systems being made available to persons authorised to supply or generate electricity. The Dispatch Code is conceived as a statement of what is optimal (particularly from a technical point of view) for all Users and the System Operator itself in relation to the planning, operation and use of the System. It seeks to avoid any undue discrimination between Users and categories of Users.

[2] The purpose of the Dispatch Code is to:

1. set out the roles, responsibilities and process for the scheduling and dispatch of generation and demand-side resources in meeting the electricity demand.
2. enable the System Operator to coordinate maintenance outages as far as possible in advance to allow the System Operator to maintain system integrity and reliability.
3. ensure fair and equitable treatment of all generator operators connected to the Grid.

The Dispatch Code is divided into the following sections:

SECTION-1: INTRODUCTION TO THE CODE

SECTION-2: CONFIDENTIALITY

SECTION-3: SHORT TERM OPERATIONAL PLANNING

Sets out the requirements for system data, procedure and timing for the System Operator to carrying operational planning

SECTION-4: OPERATING MARGIN

Sets out the types of reserves making up the Operating Margin that the System Operator may use in the Control Phase

SECTION-5: MERIT ORDER SYSTEM

Specifies the requirements for the System Operator to establish a Merit Order based on the real or contracted Variable Operating Cost component of each Generating Unit or Complex.

SECTION 6 UNIT SCHEDULING and COMMITTMENT

Specifies the System Operator's obligation to prepare a Unit Commitment and Dispatch Schedule which reasonably reflects the likely System conditions.

SECTION-7: SCADA SYSTEM UPDATE

Specifies the requirement for the System Operator to update the daily projected Demand Forecast in real time.

SECTION-8: INSTRUCTION TO SYNCHRONIZE / DESYNCHRONIZE

Specifies the times at which a Generator shall be synchronized and desynchronized which shall be directed by the System Control Engineer.

SECTION-9: FREQUENCY AND VOLTAGE CONTROL

Specifies the adherence to the frequency and voltage standards to be the responsibility of the System Control Engineer.

SECTION-10: OPERATING RESERVE MONITORING AND MANAGEMENT

Specifies the System minimum Spinning Reserve margin, operating reserves.

SECTION-11: DISPATCH DEVIATION TRACKING AND REPORTING

Specifies the recording of all dispatch instructions and the compliance of each Generator with the instructions received.

SECTION-12: SAFETY CO-ORDINATION

Sets out the requirement to ensure that the safety procedures adopted on either side of a Interconnection Point work together to ensure the safety of personnel, and/or Plant.

SECTION-13: CONTINGENCY PLANNING

This sets out the detais of the System recovery procedures following a Major System Failure .

SECTION-14: INCIDENT INFORMATION SUPPLY

Sets out the requirements of the System Operator and Generators to issue notices of all Incidents on their respective Systems that have or may have implications for the Transmission System or a User's System.

SECTION 15: METERING AND DATA ACQUISITION

Refers to the contents of the System Operator's SCADA policy.

SECTION 16: DATA TO BE EXCHANGED BETWEEN THE SYSTEM OPERATOR AND GENERATORS

Provides details of Schedules covering the data to be exchanged between the System Operator and Generators.

SECTION 17: DATA SCHEDULES

IC 8.1 Supply Code

The Supply Code specifies the rules governing the obligations of the licensee and consumers vis-à-vis each other.

The purpose of the Supply Code is to specify the set of practices that shall be adopted by the licensee to provide efficient, cost effective and Consumer friendly service to the consumers.

This Supply Code shall be applicable to:

(1) the Licensee and all consumers in the Island of Jamaica as covered under the Electricity Act.

(2) unauthorised supply, unauthorised use, diversion and other means of unauthorised use/ abstraction/theft of electricity.

The Supply Code consists of the following sections:

The Supply Code consists of 13 Sections as follows;

SECTION-1: INTRODUCTION TO THE CODE

SECTION-2: SYSTEM OF SUPPLY AND CLASSIFICATION OF CONSUMERS

SECTION-3: NEW CONNECTIONS

SECTION-4: CUSTOMERS WITH EMBEDDED GENERATION

IC 9.0 CODES TERMINOLOGY

IC 9.1 Glossary, Definition and Acronyms

The Codes terminology and capitalized terms are set forth in the Appendix A, Table of Definitions and Acronyms.

IC 10.0 Modifications to the Codes

IC 10.1 Code Review Working Group

Modification of the Codes shall be executed by the OUR through a Code Review Working Group. The Office shall establish and maintain a Code Review Working Group, which will be a standing body charged with reviewing the Codes. The Working Group shall report to the OUR on its dealings and, as appropriate, recommend amendments to the codes for the OUR's approval.

IC 10.2 Duties of the Code Review Working Group.

The functions of the Working Group shall as follows:

a. to ensure that all operational procedures and requirements governed by the Codes remain up to date;
b. to ensure that the Codes are consistent in their approach and are developed in a consistent manner;
c. consider recommendations made by Subcommittees established to focus on specialized issues.
d. review all proposals for amendments to the Codes which the System Operator, the Generators, other Users, or the OUR ,from time to time may wish to submit to the Working Group for consideration;
e. consider unforeseen circumstances referred to it by the System Operator and determine whether the actions taken by the System Operator were justified and what changes, if any, are necessary to the Codes;
f. consider whether decisions of the Office require revision of the Codes; and
g. present recommendations to the OUR as to amendments to the Codes that it considers necessary and the reason for such changes.

IC 10.3 Composition of the Code Review Working Group

The Working Group shall consist of the following persons drawn from the following categories and appointed by the Office:

a. A representative of the Office
b. A representative of the System Operator’s System Control Centre;
c. A representative of the System Operator’s Transmission System;
d. A representative of the System Operator’s Distribution System;

e. A representative of JPS owned Generator;
f. Two representatives of the IPPs and Co-Generators;
g. A representative of Net Billing, Power Wheeling and Auxiliary Interconnection Users.

The Office shall appoint the chairperson of the Working Group.

IC 10.4 Operations of the Working Group

The Working Group shall establish rules for the conduct of its business, including terms of appointments and retirement of members, and submit same for the approval of the OUR.

The Working Group shall meet at least once per calendar year.

The Working Group shall take its decisions by means of consensus. If the Working Group is unable to reach unanimous agreement or consensus, the matter shall be referred to the OUR for determination. Any such referral to the OUR shall set out the cause of disagreement and the views held by the respective members.

The Working Group may establish subcommittees from its members and co-opt other persons and experts as the Working Group considers appropriate to develop technical standards as may be required from time to time.

Codes Technical Standards

The Technical Standards are the sections of the Codes that imposes obligations such as those relating to Engineering Standards, System Operation Policy and Procedures and JPS Policies. Changes to these standards shall be in line with IC 10.5

IC 10.7 REVISIONS OF THE CODES

The Office shall publish on its website or in any other manner that it considers appropriate the revised versions of the Codes as recommended by the Working Group and approved by the OUR and the Code Change Register.

All changes made to each of the Codes shall be logged in the Code Change Register which shall indicate the section which was amended and the reason for the change. The Code Change Register will be restarted if the OUR determines that the Codes are to be revised in entirety.

The Working Group and the System Operator shall retain a list of all Users that have made a written request to be informed of changes to the Codes and shall inform such Users in writing of any changes.

The System Operator shall also publish the revised Codes its website along with the Code Change Register.

IC 11 NON-COMPLIANCE

IC 11.1 Granting of Derogation from Obligation

The OUR may, after consultation with the System Operator, issue a Derogation from Obligation suspending the System Operator's or a User's or a Generator's obligations to implement or comply with the Codes to the extent specified in the Derogation from Obligation; provided that the exercise of the power to issue such Derogation from Obligation is consistent with the provisions of applicable legislation.

IC 11.2 Request for Derogation from Obligation

A request for Derogation from Obligation from any provision in the Codes shall contain the following information:

a. The clause against which the present or predicted non-compliance is identified;
b. The reason for non-compliance with the provision;
c. Identification of the Apparatus in respect of which a Derogation from Obligation is being sought;
d. Whether the Derogation from Obligation sought is permanent or temporarily for the purposes of achieving compliance. If temporarily for the purpose of achieving compliance, the date by which the non-compliance will be remedied.

IC 11.3 Derogation from Obligation for Existing Apparatus not in Compliance

Where at the effective date of the Codes, not all Apparatus in the System in use are able to meet the Technical Standards defined therein and where it is not reasonably economical or technically necessary to upgrade the existing Apparatus to meet the required standard, consideration should be given to a time bound Derogation from Obligation for all or part of the existing User's System or System.

IC 12 DISPUTE RESOLUTION

IC.12.1 Mutual Discussion

If a Dispute between the System Operator and a User or a Generator in connection with, or arising out of, any clause in the Codes, either party may issue to the other party a Dispute Notice outlining the matter in Dispute. Following issuance of a Dispute Notice both parties shall discuss in good faith and attempt to settle the Dispute between them.

Where the parties fail to settle the Dispute amicably, either party to the Dispute may submit the Dispute to the Working Group, which shall consider the Dispute

and shall, at its sole discretion and subject to the approval of the OUR, revise any aspect of the Codes. Any such revision of the Codes shall determine the outcome of the Dispute.

IC 12.2 Determination by the OUR

Subject to IC12.1.2 and any legally binding agreement between the parties, if the Dispute cannot be settled within thirty (30) days after issue of the Dispute Notice, either party shall have the right to refer the Dispute to the OUR for resolution. In this case the procedure shall be as follows:

The request for referral to the OUR shall be made in writing to the OUR with the copy of the original Dispute Notice between the Parties attached.

Upon receipt of a request for referral, the OUR shall write to both parties acknowledging that the Dispute has been referred to the OUR for resolution.

Following receipt of OUR acknowledgment, each party shall have five (5) working days to submit their reason(s) as to the cause of the Dispute in writing to the OUR.

No later than ten (10) working days after the OUR has received each party's reason(s) in writing, the OUR shall write to each Party setting out how the OUR intends to resolve the Dispute and indicate a date by which its determination of the Dispute may be expected which in any case shall not exceed three months from the date of the request for referral.

The determination by the OUR shall be legally binding on both parties, subject to the right of either party to appeal such determination which shall be exercised in accordance with the provisions of the Electricity Act or the Electricity Licence.

Upon receipt of a revision of the Codes from the Working Group, the OUR shall submit comments to the Working Group within thirty (30) days of receipt thereof and the final ratification process of the Code should take no more than 3 months.

APPENDIX A

TABLE OF DEFINITIONS AND ACRONYMS

AC		Alternating Current
~~Act~~		~~The Electricity Lighting Act (ELA)~~
Active Power (W)		The time average of the instantaneous power over one period of the electrical wave, measured in Watts (W) or multiples thereof. For AC circuits or Systems, it is the product of the root-mean-square (RMS) or effective value of the voltage and the RMS value of the in-phase component of the current. In a three phase system, it is the sum of the Active Power of the individual phases.
Advanced Metering Infrastructure (AMI)		Metering Systems that measure, collect and analyse energy usage, from advanced electricity meters using various communication channels either on request or on a pre-defined schedule. The infrastructure includes hardware, software and communications.
Apparatus		Equipment in which electrical conductors are used supported or of which they may form part
Apparent Power, (VA)		A unit of electric measurement, measured in Volt-Ampere (VA), or multiples thereof, equal to the product of a volt and an ampere that for the DC constitutes a measure of power equivalent to a Watt (W).
Authority for Access		Authority granted to a person(s) by the System Operator to enter its site without supervision.
Average Conditions		That combination of observed values of weather conditions averaged over a long period of time.
Black Start		The procedure necessary to recover from a Total or Partial System Shutdown.
Breaking Capacity		A value of prospective current that a switching device is capable of breaking at a stated voltage under prescribed conditions of use and behaviour.
BSJ		Bureau of Standards, Jamaica.
Circuit Breaker		A mechanical switching device, which is capable of making, carrying, and breaking current under normal circuit conditions and also capable of making, carrying for a specified time, and

		breaking current under specified abnormal circuit conditions, such as a short circuit.
Codes		Refers to the Generation, Transmission, Distribution, Dispatch and Supply Codes collectively or any combination of more than Code.
Code Change Register		Register of all changes to the Transmission and Distribution Codes
Code Review Working Group		The Working Group established by the OUR to review the Codes and make recommendations to the OUR, with the functions and duties
Co-Generator		A facility which simultaneously provides electrical and thermal energy from a singular fuel source for its process requirements as well as electrical output to the System.
Completion Date		The date of energisation of the Connection Point.
Connection Agreement		An agreement made between the System Operator and a User or Generator setting out the terms and conditions relating to the use of the Connection Point.
Connection Point		The point on the Transmission System at which a User or Generator is connected.
Connection Related Planning Studies		Power flow simulations, short circuit and stability studies performed as necessary to determine the requirements for the connection of loads to the System to ensure the security and reliability of the System.
Connection Site		The physical site belonging to the System Operator, Generator or User where a Connection Point is located.
Contingency Reserve		The margin of generation over forecast Demand which is required in the period from 24 hours ahead down to real time to cover against uncertainties in Generating Unit(s)' availability and against both weather forecast and Demand forecast errors.
Control Person		A person who has been nominated by an appropriate officer of the System Operator or a User to be responsible for controlling and co-ordinating safety activities necessary to achieve safety on the System.
Critical Fault Clearing Time (CFCT)		The maximum fault duration (time) for which the System remains transiently stable.

Current Transformer (CT)		A device which has its primary winding connected in series with the current to be measured and a secondary winding which provides a current proportional to the primary current at a range suitable for measurement or control.
Customer(s)		Any person or entity supplied with electricity service under a contract with the Supply Licensee.
Customer Demand Management		The reduction in the supply of electricity to a Customer or the disconnection of a Customer in a manner agreed between a Customer and JPS.
DC		Direct Current
Demand		The Demand of MW or MVAR of electric power (i.e. both Active and Reactive Power respectively) unless otherwise stated
Derogation of Obligation		A waiver issued by the OUR after consultation with the System Operator, suspending the System Operator's or a User's obligations to implement or comply with the requirements of the Transmission Code.
Discount Rate		The percentage by which the value of a cash flow in a Discounted Cash Flow (DCF) valuation is reduced for each time period by which it is removed from the present
Discounted Cash Flow		A method of evaluating an investment by estimating future cash flows and taking into consideration the time value of money.
Dispatch		The activities involved in the central management and direction of generating plants and other sources of supply to the System in order to achieve the optimal safety, reliability and economic supply of electricity.
Dispatch Code		The rules governing dispatch activities.
Dispute		Any controversy or difference between the System Operator and a User or a Generator in connection with, or arising out of, any clause in the Transmission Code.
Dispute Notice		A written notice issued by either Party to a Dispute outlining the matter in Dispute.
Distribution		The conveyance of electricity by means of distribution lines., which are electric power lines operating below 69 kV.
Distribution Code		The rules governing the distribution system and activities related thereto.

Distribution Code Technical Standards		The Technical Specifications applicable/implemented to govern the technical development and operation of the Distribution System as listed in section DGC 10.6
Distribution Licensee		The Person having an electricity license to establish, maintain and operate the Distribution. For the avoidance of doubt, the Transmission Licensee includes [does not include]a User who owns and operates a User System
Distribution System		That part of the electric System that operates below 69kV from the point of the outgoing isolators of a Feeder - Circuit Breaker (recloser) at transmission substations transforming to 24kV, 13.8kV and 12kV, consisting of Apparatus and meters owned and operated by the System Operator used in connection with the distribution of electricity.
Earth Fault Factor		At a selected location of a three-phase system (generally the point of installation of equipment) and for a given system configuration, the ratio of the highest root mean square phase-to earth power frequency voltage on a sound phase during a fault to earth (affecting one or more phases at any point) to the root mean square phase-to-earth power frequency voltage which would be obtained at the selected location without the fault.
Electricity Act		Refers to the Electricity Act, 2015 promulgated 2015 August 27
Electricity Licence		Refers to the Electricity Licence, 2016 promulgated 2016 January 27 issued to JPS by the Government of Jamaica authorizing JPS to generate and exclusively transmit, distribute and supply electricity in the island of Jamaica for public and private purposes.
Embedded Generating Facility		Any facility whether privately or JPS owned containing one or more Embedded Generating Units and associated infrastructure producing and delivering electrical energy to the Distribution System and has no connection to the Transmission System.
Embedded Generating Unit		An individual generator which is part of an Embedded Generating Plant.
Embedded Generator		A person or entity that generates electricity using an Embedded Generating Plant.
Emergency Operation Centre		The main control centre for the operation of the System during emergency conditions (post hurricane restoration).

Entry Point		The point at which Users connect to the Transmission System where power flows into the Transmission System.
Equipment		Plant and/or Apparatus
Exit Point		The point at which Users connect to the Transmission System where power flows out of the Transmission System.
Fault Level		The expected current, expressed in kA or Fault MVA, which will flow into a short circuit at a specified point on the Distribution System or any Users System.
Feeder		Means an MV electric line(s) and associated MV Equipment which the System Operator uses to distribute electricity from a power source.
Force Majeure		Causes beyond the reasonable control of and without the fault or negligence of the Party claiming Force Majeure. It shall include failure or interruption of the delivery of electric power due to causes beyond that Party's control, including acts of God, wars, sabotage, riots, hurricanes and other actions of the elements, civil disturbances and strikes.
Generating Unit		Any electric power generating Plant or Apparatus, whether privately or JPS owned, delivering electrical energy to the Transmission or Distribution System.
Generating Plant		Any facility whether privately or JPS owned containing one or more Generating Units and associate infrastructure producing and delivering electrical energy to the Transmission or Distribution System.
Generation		The production of electricity by means of a Plant or Apparatus
Generation Code		The rules governing Generation activities in the electricity sector.
~~Grid Code Review Panel~~		~~A panel responsible for keeping the Generation, Transmission, Distribution, Supply, and Dispatch Codes and its working under review and shall report to the OUR on its dealings and recommend amendments to the Generation Code for the OUR's approval~~
Generator		Owner and/or operator of an electricity Generating Plant, supplying power to the System Operator
Grid		Used interchangeably with the term "System"
Guaranteed Standards		As required by Condition 17 of the Electricity Licence

High Voltage (HV)		The parts of the System operating at 69kV and above
Incident		An unscheduled or unplanned (although it may have been anticipated) occurrence on the Transmission or Distribution System or Users' System, including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.
Incident Centre		A centre established as determined by the System Operator following a Significant Incident to provide a focal point for communication and the dissemination of information between System Operator and representatives of relevant Users.
Interconnection Agreement		An agreement between the System Operator and a Generator or User providing for the connection of the Generating Unit or User plant to the Transmission System
Interconnection Point		The physical point(s) where the Generator and the System Grid are connected as specified in Sub-section 1.1
IPP		Independent Power Producer
Joint System Incident		An Incident which, in the opinion of the System Operator or a User, has or may have a serious and/or widespread effect on the Transmission System, Distribution System or on a User System.
JPS		Jamaica Public Service Company Limited.
JPS Guide To The Interconnection Of Distributed Generation		The document prepared by JPS that establishes the criteria and requirements for the interconnection of Embedded Generators, as revised from time to time
Large Customer		Customers who by virtue of the magnitude or characteristics of their Demand are connected directly to the Transmission System.
~~Licence~~		~~The Electricity Licence 2016, effective January 27, 2016, issued to JPS by the Ministry of Science,Energy, and Technology pursuant to the 2015 Electricity Act, authorizing JPS to generate, transmit, distribute and supply electricity in the island of Jamaica for public and private purposes.~~
Local Safety Procedures		Procedures at each Connection Point approved by the System Operator or the relevant User setting out the methods to achieve

		safety for those working on Plant and Apparatus to which their Safety Rules apply.
Low Voltage (LV)		The parts of the System operating at 415V and less
Making Capacity (of a switching device or a fuse)		A value of prospective fault current that a switching device is capable of making at a stated voltage under prescribed conditions of use and behaviour
Maximum Demand (MD)		The maximum measured value of Demand that occurs within a specified time period (e.g. month, year)
Metering Point		The point of connection of the terminals of a whole current meter or the point of the Current Transformers for CT metering.
Minimum Plant		The theoretical condition with minimum fault infeed from connected generation.
Medium Voltage (MV)		The parts of the System operating at voltages above 415V and below 69kV
N-1		The loss of any single element (such as an electric line, transformer etc) from the Transmission System or Distribution System
Office		The Office of Utilities Regulation established pursuant to the Office of Utilities Regulation Act.
Operating Reserve		Generating capability in MW above firm System Demand available to provide for regulation, load forecasting error, equipment forced and scheduled outage. It consists of Spinning and Non Spinning Reserve (Generation Code).
Net Billing		Mechanism for Self-Generators to sell or be otherwise credited with the value for the excess power generated under standard offer contracts with the Single Buyer that have been approved by the Office
Operation		A scheduled or planned action relating to the operation of the System or a User System.
Operation Diagram		Diagrams which are a schematic representation of the HV and MV Apparatus and the connections to all external circuits at a Connection Site (Point), incorporating its numbering, nomenclature and labelling.
Operational Effect		Any effect on the operation of the Transmission System which will or may cause the Transmission System or the User's system,

		as the case may be, to operate adversely from the way in which they would or may have operated in the absence of that effect.
Operational Interface		The common boundaries of the User and System Operator Connection Sites
Operating Margin		The amount of reserve, provided by Generating Units or by Demand control, available over and above that required to meet the expected Demand. It is required to limit and then correct frequency deviations that may occur due to an imbalance between total generation capacity output and Demand.
OUR		Office of Utilities Regulation established pursuant to the Office of Utilities Regulation Act
Overall Standards		As required by Condition 17 of the Electricity Licence
Party		The System Operator System Operator and all Users of the System
Plant		Fixed and moveable items used in the generation, transmission or distribution of electricity other than Apparatus
Point of Common Coupling (PPC)		The closest point on the System Operators side of the User's Connection Point where another User is or could be connected.
Power Island		A group of Generating Units together with complementary local Demand, disconnected from any other power source or the Total System.
Power Purchase Agreement (PPA)		The contract that governs the commercial relationship between an IPP and the Single Buyer which is approved by the OUR and that requires the Single Buyer to buy electricity from the IPP and the IPP to sell electricity to the Single Buyer in accordance with the terms and conditions thereof
Power Quality Policy		The System Operator's policy document that outlines the parameters, standards and normal operating limits relevant to power quality, to be developed by the System Operator, approved by the OUR and as amended from time to time.
Power Wheeling		An arrangement whereby a Self Generator provides electricity to the system on terms pursuant to which an equivalent amount of electricity may be used from the system at one or more locations, in accordance with the Electricity Act and any regulations thereunder.

Prudent Utility Practice		The practices generally followed by the electric utility industry in respect to the design, construction, operation, and maintenance of electric generating, transmission, and distribution facilities, including, but not limited to, the engineering, operating, and safety practices generally followed by such utility industries.
Reactive Power (VAR)		The component of electrical power representing the alternating exchange of stored energy (inductive or capacitive) between sources and loads or between two systems, measured in VAR, or multiples thereof. For AC circuits or systems, it is the product of the RMS voltage and the RMS value of the quadrature component of alternating current. In a three phase system, it the sum of the Reactive Power of the Individual phases.
Registered Capacity		The normal full load capacity of a Generating Unit or Embedded Generating Unit as declared by the Generator or Embedded Generator respectively, less the MW consumed by the Generating Unit or Embedded Generating Unit through auxiliary/unit transformers when producing at full load. It is expressed in MW or kW.
Renewable Energy Source		Energy sources that are not depleted when exploited and includes sources prescribed by the Minister by order published in the Gazette
Rural Electrification Project		Works undertaken by the Rural Electrification Programme Limited (REP) under Condition 26 of the Electricity Licence.
Safety Co-ordinator		A person nominated by the System Operator and each User in relation to a Connection Point to be responsible for the coordination of safety precautions when work is to be carried out which requires the provision of safety precautions on Apparatus.
Safety Management System		The procedure adopted by the System Operator or User to ensure the safe Operation of the System and the safety of personnel required to work on the System.
Safety Rules		The rules or procedures of the System Operator or User to ensure safety of persons working on or testing Apparatus from the dangers inherent in working on or testing Apparatus that forms part or is connected to the Transmission or Distribution Systems.
SCADA		Supervisory Control And Data Acquisition.
Service Area		A section of the Distribution System supplied by one or more substation busbars and/or Feeders of the same MV level.

Self Generator		A person who generates electricity for that person's own exclusive use, and shall include a person who has entered into a Net Billing or Power Wheeling arrangement
SF6		Sulphur Hexaflouride Gas used for the insulation of HV and MV Equipment
Short Circuit Ratio (SCR)		The ratio of the field current required for the rated voltage at open circuit to the field current required for the rated armature current at short circuit for synchronous Generating Units
Significant Incident		An Incident which in the opinion of the System Operator has had a significant effect on the Transmission or Distribution System or the User System .
Single Buyer		The licensee (currently JPS) whose license obligates it to purchase electricity generated by independent power producers and persons having net billing, power wheeling, or auxiliary interconnection arrangements
Site Common Drawings		Drawings prepared for each Connection Site (Point) which incorporate Connection Site layout drawings, electrical layout drawings, common protection/control drawings and common services drawings.
Site Investigation Tests		Tests conducted in relation to Plant, Apparatus and Operational Procedures at Generation Facilities and User Sites or to monitor and assess the characteristics of Plant.
Spinning Reserve		Unloaded generating capacity in MW which is synchronized and ready to serve additional Demand as set forth in the Generation Code.
Standard Offer Contract		A contract developed and approved by the Office for use in promoting renewable energy with capacity limits established by the Minister under a Net Billing arrangement.
Subdivision		An area of real estate composed of subdivided lots.
Supply		Activities involved in the sale of electricity to consumers
Supply Code		The rules governing the Supply of electricity
Supply Licensee		A person holding the electricity licence to Supply electricity
System		The interconnection facilities and any other Transmission System or Distribution System transmission or distribution facilities on the System Operator side of the Connection Point(s) through which the electrical energy output from the Generating Unit(s)

		will be distributed by the System Operator to Users of electricity. (See Generation Code). The terms "Grid" and System" have identical meanings and are used interchangeably.
System Control		The administrative and other arrangements established to maintain as far as possible the proper safety and security of the System.
System Control Centre		The main control centre of the System Operator located in Kingston, Jamaica, or such other control centre designated by the System Operator from time to time (but not more than one at any time) from which the System Operator shall issue dispatch instructions to the Generators.
System Incident		An event on a part of the System or a User System that has an adverse effect on the rest of the System or other User System
System Incident Communications Procedures		Procedures agreed between the System Operator and Users to ensure secure communications during System Incidents.
System Operator		The person responsible for prudent and efficient management of the System and in that capacity, for dealing with all Generators, Embedded Generators and Users in a consistent and non-discriminatory manner, currently JPS, the holder of the License.
System Restoration Strategy		The strategy setting out the procedures for the restoration of the System following a major Incident.
System Test		A test or series of tests involving the simulation of conditions or the controlled application of unusual or extreme conditions which may have an impact on the Transmission, Distribution or User Systems.
Ten Minute Reserve		An additional amount of Operating Reserve sufficient to reduce generation deficiency within ten minutes following the loss of generating capacity (See Generation Code).
Test Document		The document prepared by the Test Panel setting out all aspects for the management and implementation of a test.
Test Panel		A panel established to prepare a detailed programme for the conduct of an operational test or Site Investigation and to prepare a formal Test Document.
Test Request		A document setting out the detailed proposal for an operational test or Site Investigation Test

Total System		The Transmission and Distribution Systems together with all User Systems.
Total System Shutdown		The situation when all generation connected to the Total System has ceased and the Total System has ceased to function.
Transient Stability		The inherent ability of a power system to remain stable and maintain network synchronism when subjected to severe disturbances
Transmission		The conveyance of electricity by means of transmission lines which are electric power lines operating at 69 kV or higher
Transmission Code		Rules governing the Transmission System and activities relating thereto.
Transmission Code Technical Standards		Technical specifications applicable/implemented to govern the technical development and operation of the Transmission System
Transmission Constraint		A limitation on the use of the System due to lack of transmission capacity or other System conditions.
Transmission Licensee		The Person having an electricity license to establish, maintain and operate the Transmission System. For the avoidance of doubt, the Transmission Licensee includes [does not include]a User who owns and operates a User System
Transmission Security Standards		The standards set out in this Transmission Code by which the System Operator shall plan and operate the Transmission System to ensure a reliable and secure supply of electricity to Customers.
Transmission Site		A site owned (or occupied pursuant to a lease, licence or other agreement) by the System Operator in which there is a Connection Point. For the avoidance of doubt, where a site is owned by a User but occupied by the System Operator, the site is a Transmission Site .
Transmission System		That part of the electric System from the HV side of the Generating Unit Step Up (GSU) transformer that operates at 69kV or higher, and includes the Equipment on the secondary side of transformers at transmission substations transforming to 24kV, 13.8kV and 12kV up to the outgoing Isolators of the Feeder - Circuit Breaker (recloser), and consists of electric lines, Equipment and meters owned and operated by the Transmission Licensee in connection with transmission of electricity. [This does not include a User System

Under Frequency Relay		An electrical measuring relay intended to operate when its characteristic quantity (frequency) reaches the relay settings by a decrease in frequency.
Under Voltage Relay		An electrical measuring relay intended to operate when its characteristic quantity (voltage) reaches the relay settings by a decrease in voltage.
User(s)		Term used to refer to any person using the Transmission System or Distribution System, as more particularly identified in each section of the respective Code. In the Introduction and General Conditions the term means any person (other than JPS) to whom the Codes applies.
User Site		A site owned (or occupied pursuant to a lease, Licence or other agreement) by a User in which there is a Connection Point . For the avoidance of doubt, where a site is owned by the Transmission System or Distribution System owner but occupied by a User the site is a User Site
User(s)' System		The Transmission System or Distribution System owned and operated by a User, as opposed to a Transmission Licensee.
VAR-hour (VARh)		A unit of electric measurement, measured in reactive volt-ampere hour (VARh), or multiples thereof, of Reactive Power of one VAR integrated over one hour.
Variable Renewable Power Plant (VRPP)		Renewable Energy Power Plant with continuously varying power output following the availability of primary energy without any storage (wind and solar PV).
Voltage Flicker		Voltage Flicker is the rapid change in voltage that distorts or interferes with the normal sinusoidal voltage waveform of the Transmission and Distribution Systems
VoltageTransformer (metering)		A device which has its primary winding connected in shunt with the power circuit to be measured and a secondary winding which provides a voltage proportional to the primary voltage at a range suitable for measurement or control.
Watt-hour (Wh)		A measure of the electrical energy equivalent to a power consumption of one watt of Real Power for one hour, measured in watt-hour (Wh) or multiples thereof.

Working Group		Refers to the Code Review Working Group established by the Office
X/R Ratio		The amount of reactance X divided by the amount of resistance R which is the same as the tangent of an angle created by reactance and resistance in an AC circuit.