Registration No: KOD/ST/No.8/2025

Suruhanjaya Tenaga
Energy Commission

GRID CODE FOR PENINSULAR MALAYSIA

MAIN CODE

MAIN CODE

Registration Record

REGISTRATION NO.	REVISION DATE	REMARKS

ELECTRICITY SUPPLY ACT 1990
[*Act 447*]

GRID CODE FOR PENINSULAR MALAYSIA – MAIN CODE

KOD/ST/No.8/2025

IN exercise of the powers conferred by section 50A of the Electricity Supply Act 1990 [*Act 447*], the Commission issues the following code:

Citation and commencement

1. This Code may be cited as the **Grid Code for Peninsular Malaysia – Main Code.**

2. This Code comes into operation on 01 January 2026.

Purpose

3. The purpose of the Main Code is to describe the procedures, requirements, responsibilities and obligations of the Grid System Operator, Single Buyer, Grid Owner and all Users of the Grid System to ensure its efficient development and secure operation without unduly discriminating any user or category of users.

Interpretation

4. In this Code, unless the context otherwise requires, the definitions of terms used in the Main Code are as provided in the Additional Code: Glossary and Definitions.

Date: 28 March 2025

PN. SITI SAFINAH BINTI SALLEH
Chief Executive Officer
Energy Commission

Approved

DATO' SRI HAJI FADILLAH BIN HAJI YUSOF
Minister of Energy Transition
and Water Transformation

Preface

P.1 Introduction

P.1.1 The purpose of the Preface is to provide the rationale for the development of the Grid Code for Peninsular Malaysia (GCPM) and to give an overview of the general content of the Grid Code.

P.1.2 This Preface is for information only and does not constitute a part of the GCPM.

P.2 The Grid Code

P.2.1 The term “Grid Code” is widely used to refer to a document or set of documents that legally establish technical and other requirements for the connection to and use of an electrical system in a manner that will ensure reliable, efficient and safe operation.

P.2.2 The Grid Code is an essential document to provide the procedures, requirements, responsibilities and obligations of the GSO, Single Buyer, Grid Owner and all Users of the Grid System to ensure its efficient development and secure operation without unduly discriminating any user or category of users.

P.2.3 The Grid Code is designed to permit the development, maintenance and operation of the Grid System in an efficient, coordinated and economical manner, providing a defined level of power quality and avoiding any undue discrimination between Users and categories of Users connected to the Grid System. In coordinating design, system development, operational planning including generation scheduling, and real time operation of the system, the GSO, Single Buyer, Grid Owner and all Users connected to the system are required to comply with the Grid Code to ensure secure and safe operation of the system.

P.2.4 Compliance with the Grid Code is mandatory to each User in accordance with section 50A of the Electricity Supply Act 1990 [*Act 447*] and the terms and conditions of the license applicable to each User.

P.3 Development of the Grid Code

P.3.1 According to section 50A of the Electricity Supply Act 1990 [*Act 447*], the Commission may, with the approval of the Minister, develop and issue codes relating to the generation, transmission, distribution, supply and use of electricity and for electrical safety. Moreover, the Commission may develop and issue such additional codes as it deems fit and expedient or as the Minister may from time to time direct, as the case may be.

P.3.2 The Commission may vary, review or revoke the Main Code with the approval of the Minister for the time being charged with the responsibility for matters relating to the supply of electricity, and the Commission may vary, review or revoke the Additional Codes itself.

P.3.3 The development and administration of the Grid Code is governed by specific rules which are set out in Part II of the Main Code entitled “General Conditions”. Any amendment to the Grid Code are subject to a transparent procedure led by the Grid Code Committee.

<END OF PREFACE>

Part I: Introduction and Purpose

IP.1 Objectives

IP.1.1 The objectives of this Part are to describe the following:

(a) the scope of the Grid Code;

(b) the purpose of the Grid Code;

(c) the general requirements for the GSO to ensure the security and reliability of the system at all times;

(d) the detailed structure of the Grid Code.

IP.2 Scope of the Grid Code

IP.2.1 The Grid Code is applicable to the GSO, Single Buyer, Grid Owner and all Users of the Grid System.

IP.2.2 Other parties associated with the Grid System are collectively named in the Grid Code as the Users. The Users could consist of the Grid Owner who owns, operates and maintains the Grid System assets, Generators, Distributors, Grid Connected Customers, Network Operators, Aggregators, Energy Storage Operators and Retailers.

IP.2.3 The requirements necessary for interconnection management in relation to planning, connection, operation, scheduling and dispatch, metering and cybersecurity are set out in Interconnection Agreements. Externally Interconnected Parties are not subject to the Grid Code.

IP.3 Purpose of the Grid Code

IP.3.1 The Grid Code is designed to permit the development, maintenance and operation of an efficient, coordinated and economical Grid System. It is devised as a statement of what is optimal, particularly from a technical point of view, for all Users in relation to the planning, operation and use of the Grid System.

IP.3.2 The Grid Code is an inseparable integral part of a set of legal and technical documents defining the governance of the Malaysian Electricity Supply Industry.

IP.3.3 The purpose of the Grid Code is to describe the rights and responsibilities of all relevant parties towards ensuring the security and reliability of the Grid System. This Grid Code sets out the operating procedures and principles governing the relationship between the GSO, the Single Buyer, the Grid Owner and all Users of the Grid System. The Grid Code also specifies day-to-day procedures for both planning and operational purposes and covers a wide range of operational conditions likely to be encountered under both normal and exceptional circumstances.

IP.4 General

IP.4.1 It is recognised that prior to the establishment of this Grid Code, Generation Licensees had concluded Power Purchase Agreements (PPAs) which may be at variance to the provisions of this Grid Code. For the purpose of the Power Purchase Agreements that has been concluded prior to the establishment of this Grid Code, nothing contained in this Grid Code is intended to modify the parties' rights and obligations under the Power Purchase Agreements. In the event of any conflict, the Power Purchase Agreements take precedence only to the extent that it does not affect the security and safety of the Grid System, or seeks to impose any liability on the GSO in the discharge of the GSO's obligations under the Grid Code in accordance with the terms thereof.

IP.4.2 For the purpose of this Grid Code, which corresponds to the current industry structure, the GSO is responsible for:

(a) operational planning;

(b) real-time re-scheduling;

(c) dispatch and control of the Grid System;

(d) coordination of all parties connected to the Grid System;

(e) operation of the Interconnections.

IP.5 General Requirements

IP.5.1 While the Grid Code contains procedures for equitable management of the technical and economic aspects of the Grid System, taking into account a wide range of operational conditions likely to be encountered under both normal and exceptional circumstances, it is also necessary to recognise that it cannot predict and address all

possible operational situations. It also relies on all Users complying with the procedures in their entirety. The Users must therefore understand and accept that the GSO, in unforeseen circumstances, will act decisively, to reasonably and prudently discharge its responsibilities towards ensuring system security at all times in pursuance of any one or combination of the following General Requirements:

(a) the preservation or restoration of the Grid System integrity;

(b) the compliance of the Users with obligations imposed by their Licences or the Grid Code;

(c) the avoidance of the breakdown, separation, islanding, collapse or blackout of the whole or parts of the Grid System;

(d) the fulfilment of safety requirements under all circumstances and at all times; or

(e) the prevention of damage to the Plant and Apparatus or the environment.

IP.5.2 In the absence of an applicable provision of the Grid Code or any of these General Requirements, reference shall be made to the following:

(a) the application of a policy by the GSO aimed at equitable distribution among Users of any temporary restriction that might be necessary in exceptional circumstances; and

(b) the application of Prudent Industry Practice.

IP.5.3 The GSO shall brief the Grid Code Committee from time to time in relation to the operational actions taken and the implementation of the provisions in the Grid Code.

IP.5.4 Users shall provide such reasonable co-operation and assistance as the Grid Owner, Single Buyer and GSO may request in pursuance of the above General Requirements, including compliance with the terms and conditions of the Licence, the Grid Code and the instructions issued by the GSO.

IP.5.5 All Users have a duty to provide such information and resources as are necessary to facilitate compliance with and the implementation of the Grid Code.

IP.5.6 The Grid Owner, Single Buyer and GSO, in planning and operating the Grid System and in contributing to the planning and operation of the Grid System, has to rely on the accuracy of information which the Users supply regarding their plant parameters, requirements and intentions. The Grid Owner, Single Buyer and GSO shall not be held

responsible for any consequence arising from its reasonable and prudent actions on the basis of such information supplied by any User.

IP.5.7 In case of submission of erroneous information by the Users which causes detrimental consequences on the real time operation of the Grid System, the GSO cannot be held responsible for the quality of this data and the directly attributable consequences.

IP.6 Constituent Parts of the Grid Code

IP.6.1 The Grid Code consists of a Main Code, containing the main provisions which structure the purpose, the scope, the governance and some general requirements, and of Additional Codes which contain the specific technical rules for various subjects related to the operation of the Grid system.

IP.6.2 The Main Code is divided into the following Parts:

(a) Part I: Introduction and Purpose;

(b) Part II: General Conditions;

(c) Part III: Main Planning Code;

(d) Part IV: Main Connection Code;

(e) Part V: Main Operating Codes;

(f) Part VI: Main Scheduling and Dispatch Codes;

(g) Part VIII: Main Data Registration Code

(h) Part VIII: Main Metering Code; and

(i) Part IX: Main Cybersecurity Code.

The Additional codes are as follows:

(a) Glossary and Definitions;

(b) Planning Code;

(c) Connection Code;

(d) Operating Codes;

(e) Scheduling and Dispatch Codes;

(f) Data Registration Code;

(g) Metering Code; and

(h) Cybersecurity Code.

IP.6.3 The Glossary and Definitions document (GD) of the Grid Code contains definitions of some terms used in the Grid Code to ensure clarity of the meaning and intention of those terms.

IP.6.4 The Part on Introduction and Purpose (IP) provides a general overview to the Grid Code, its objectives and some general requirements.

IP.6.5 The General Conditions (GC) Part deals with all administrative aspects of the Grid Code, provisions for the revision of the Grid Code as well as resolution of disputes and procedures associated with Derogations and Exemptions.

IP.6.6 The Planning Code (PC) Part describes the process by which the Grid Owner undertakes the planning and development of the Grid System within the planning timescales and the provision and supply of certain information by Users and the Grid Owner to enable this process.

IP.6.7 The Connection Code (CC) Part specifies the minimum technical, design and operational criteria which must be complied with by Users connected, seeking connection or seeking to modify their connection to the Grid System.

IP.6.8 The Operating Codes (OCs) Part, which are split into several individual Codes, deals with all processes associated with Operational Planning and Control Operation of the system in real time and the obligations of the Users to provide and supply information to the Grid Owner, Single Buyer and GSO to enable those processes. The Operating Codes consist of:

(a) the sequence in Operational Planning and Control Operation of the system beginning with forecasting the Demand in the operational timescales in accordance with Operating Code No 1 - Demand Forecast (OC1) with demand data received from Users. The Single Buyer aggregates this data and prepares the appropriate Demand forecasts for use in operational timescales;

(b) the GSO also receives planned outage data from the Users and co-ordinates the outage requests in respect of the Grid System and User Systems for commissioning, repair and maintenance in accordance with Operating Code No. 2 – Outage and Other Related Planning (OC2);

(c) the Single Buyer prepares annual and weekly generation plans taking into account the planned generation, transmission and other User outages, availability of demand control and specifying the different types of reserve and response required for frequency and voltage control, based upon the provision of certain types of User data in accordance with Operating Code No 3 - Operating Reserves and Response (OC3);

(d) the procedures to be applied in relation to the various forms of Demand Control methods available to the GSO in operating the system and their implementation in Operational Planning and Control Operation in real time are in accordance with Operating Code No 4 - Demand Control (OC4);

(e) the procedures and their implementation for communication and liaison between the GSO and the Users for coordinating the operation of the system are in accordance with Operating Code No 5 - Operational Liaison (OC5);

(f) the reporting of scheduled and planned actions and significant unscheduled occurrences such as faults and investigation of the impact of such occurrences are in accordance with Operating Code No 6 – Significant Incident Reporting (OC6);

(g) the actions to be taken by the GSO in preparing operational strategies towards maintaining the integrity of the system under severe system contingencies beyond the security criteria, and implementation of those strategies are in accordance with Operating Code No 7 – Emergency Operations (OC7);

(h) the co-ordination between GSO and User, in the establishment and maintenance of Isolation and Earthing in order that work and/or testing can be carried out safely at a Connection Point in accordance with Operating Code No 8 - Safety Coordination (OC8);

(i) the procedures for numbering and nomenclature of HV Apparatus at certain sites where new construction is to be integrated or changes are to be made to an existing Connection Point in accordance with Operating Code No 9 - Numbering and Nomenclature (OC9);

(j) the procedures for periodic testing and supervising of the effects of a User's System on the Grid System and vice versa are in accordance with Operating Code No 10 – Periodic Testing and Supervising (OC10); and

(k) the procedures for the establishment of system tests where commissioning and testing of equipment and its capability may require application of unusual or

irregular operating conditions in accordance with Operating Code No 11 - System Tests (OC11).

IP.6.9 The Grid Code also contains a Scheduling and Dispatch Code, which is split into three (3) Codes as follows:

(a) based upon the prices quoted in Power Purchase Agreements (PPAs) and certain other technical performance and outage information, the preparation of an indicative Least Cost Unit Schedule indicating which Users may be instructed or dispatched the following day in accordance with Scheduling and Dispatch Code No 1 – Unit Scheduling (SDC1). This is carried out by the Single Buyer;

(b) the issue of Control, Scheduling and Dispatch instructions to Users, and the receipt and issue of certain other information in accordance with Scheduling and Dispatch Code No. 2 - Control, Scheduling and Dispatch (SDC2). This is carried out by the GSO; and

(c) the procedures and requirements in relation to control of system frequency control and Interconnection power transfers in accordance with Scheduling and Dispatch Code No. 3 - Frequency and Interconnection Transfer Control (SDC3). This is carried out by the GSO.

IP.6.10 The Grid Code also contains a Data Registration Code, which sets out a unified listing of all data required by the Grid Owner and the GSO from Users, and vice-versa, under all of the constituent Parts of the Grid Code.

IP.6.11 The Metering Code included in the Grid Code deals with transmission metering at the Connection Points and at the interface with the Generation, Distribution and User Systems. The Metering Code includes the basic requirements for both Revenue Metering and Operational Metering when using Metering Installations.

IP.6.12 The Cybersecurity Code included in the Grid Code establishes specific rules for Cybersecurity aspects of the Grid System, including governance and management rules, general requirements, reporting and training.

<END OF PART I: INTRODUCTION AND PURPOSE>

Part II: General Conditions

GC.1 Introduction

GC.1.1 The General Conditions contain provisions which are of general application to all provisions of the Grid Code. The General Conditions are provided to ensure that the various Parts of the Main Code and the Additional Codes work together.

GC.1.2 The General Conditions also specify the arrangements for the Grid Code Committee, which requires representation from Users and therefore provides transparency to the development of the Grid Code.

GC.2 Scope of Application

GC.2.1 The General Conditions apply to the GSO, Grid Owner, Single Buyer and all Users.

GC.3 Objectives

GC.3.1 The objectives of the General Conditions are as follows:

(a) to ensure, to the extent possible, that various Parts of the Main Code and the Additional Codes work together for the benefit of all the relevant parties and the GSO;

(b) to provide a set of principles governing the status and the development of the Grid Code; and

(c) to provide a set of rules on the Grid Code governance.

GC.4 Interpretation

GC.4.1 In this Grid Code, unless the context otherwise specifies, references to Grid Code are with reference to the whole of the Grid Code, including the Additional Codes, any schedules or other documents attached to any part of the Grid Code.

GC.4.2 In this Grid Code, references to parts, codes, paragraphs, clauses or schedules are specifically to those codes, paragraphs, clauses or schedules of this Grid Code. In this Grid Code:

(a) the headings are for convenience and reference only and do not form part of the Grid Code;

(b) reference to any law, regulation made under any law, terms and conditions of the Licence, subsidiary legislation, contract, agreement or other legal document shall be to that law, regulation or document as amended, modified or replaced from time to time. Any reference to any Licence shall be to that Licence as amended, modified or replaced from time to time and to any rule, document, decision or arrangement promulgated or established under that Licence;

(c) references to the consent or approval of the Commission shall mean the approval or consent of the Commission in writing, which may be given subject to such conditions as may be determined by the Commission, as that consent or approval may be amended, modified, supplemented or replaced from time to time and to any order, instruction or requirement or decision of the Commission given, made or issued under it;

(d) all references to specific dates or periods of time shall be calculated according to the Gregorian calendar and all references to specific dates shall be on the day commencing on such date at 00:00 hours;

(e) where words or expressions are defined in this Grid Code, cognate words and expressions shall be construed accordingly;

(f) references to “person” or “persons” include individuals, firms, companies, state government agencies, federal government agencies, committees, departments, ministries and other incorporated or unincorporated bodies as well as to individuals with a separate legal personality or not; and

(g) the words “such as”, “include”, “including”, “for example” and “in particular” shall be construed as being by way of illustration or emphasis and shall not limit or prejudice the generality of any foregoing words.

GC.5 Grid Code Committee (GCC)

GC.5.1 Establishment and objectives of the GCC

GC.5.1.1 The Commission shall establish and maintain the Grid Code Committee which shall be a standing committee empowered by the Commission to oversee the implementation of the Grid Code.

GC.5.1.2 In particular, the Grid Code Committee shall:

(a) ensure the relevancy of the Grid Code;

(b) review all suggestions for amendments to the Grid Code which the Commission, the GSO, the Grid Owner, the Single Buyer or any User may wish to submit for consideration by the Grid Code Committee from time to time;

(c) publish recommendations on the amendments to the Grid Code that the GSO or the Grid Code Committee feels necessary or desirable and the reasons for the recommendations;

(d) issue its guidance in relation to the Grid Code and to ensure implementation, performance and interpretation when asked to do so by any User;

(e) consider what amendments are necessary to the Grid Code arising out of any unforeseen circumstances referred to by the GSO under GC.9;

(f) appoint an independent External Auditor to conduct an external audit on the operations of the GSO and Single Buyer;

(g) review and forward reports received from the External Auditor under GC.7, and

(h) appoint subcommittees and working groups as necessary.

GC.5.1.3 The Grid Code Committee shall establish the Terms of Reference of the Grid Code Committee which is a document containing the main rules and procedures relating to the conduct of its business. This document shall be approved by the Commission.

GC.5.1.4 The Grid Code Committee shall comply at all times with its own rules and procedures relating to the conduct of its business.

GC.5.2 Membership

GC.5.2.1 The Grid Code Committee shall consist of at least:

(a) two (2) representatives from the GSO;

(b) one (1) representative from the Single Buyer;

(c) two (2) representatives from the Commission (as observers);

(d) one (1) representative from the Grid Owner representing engineering, protection, maintenance and project activities;

(e) one (1) representative from the Grid Owner, representing the System Planning activities;

(f) eight (8) representatives from the Generators;

(g) three (3) representatives from the Distributors;

(h) one (1) representative from the Grid Connected Customers; and

(i) one (1) independent technical expert nominated by the Commission

(j) one (1) representative from Retailer.

GC.5.2.2 Additional members may occasionally be added to the list presented in Article GC.5.2.1. upon decision of the Grid Code Committee. A written decision must establish the reasons why the integration of additional members is necessary.

GC.5.2.3 The full list of the Grid Code Committee members should be published by the Commission.

GC.5.2.4 The members of the Grid Code Committee are appointed by each of the Users they are representing. They shall have sufficient technical background and experience to fully understand and evaluate the technical aspects of grid operation/planning and development.

GC.5.2.5 The salaries or honorarium of all members of the Grid Code Committee and the subcommittee(s) shall be the responsibility of their respective employers or sponsoring organization.

GC.5.3 The Chairperson

GC.5.3.1 A Chairperson shall be appointed to preside over the Grid Code Committee. The Chairperson of the Grid Code Committee shall be a representative of the Commission.

GC.5.3.2 The detailed functions of the Chairperson may be specified in the Terms of Reference of the Grid Code Committee.

GC.5.4 The Secretary

GC.5.4.1 A Secretary should be appointed within the Grid Code Committee to manage the secretariat of the Grid Code Committee. The Secretary of the Grid Code Committee shall be a representative of the GSO.

GC.5.4.2 The GSO shall fund the operations of the Grid Code Committee and its subcommittees, including permanent support staff exclusively provided for the functioning of the committee and subcommittee(s), and shall recover the costs through an appropriate provision in the annual revenue requirements.

GC.5.4.3 The detailed functions of the Secretary may be specified in the Terms of Reference of the Grid Code Committee.

GC.5.5 GC Change Administrator

GC.5.5.1 A GC Change Administrator shall be appointed to manage the Grid Code revisions. The GC Change Administrator of the Grid Code Committee shall be a representative of the GSO. The GC Change Administrator is under the supervision of the Secretary.

GC.5.5.2 The detailed functions of the GC Change Administrator may be specified in the Terms of Reference of the Grid Code Committee.

GC.5.6 Sub-committees and working groups

GC.5.6.1 The Grid Code Committee may establish such sub-committees from time to time consisting of such persons, as it considers desirable. Each sub-committee shall be subject to such written terms of reference and shall be subject to such procedures as the Grid Code Committee may determine.

GC.5.6.2 The Grid Code Committee may further establish working groups to advise it on any matter from time to time. Such working groups may consist of members and/or such other persons as the Grid Code Committee may determine for the purpose.

GC.5.6.3 The views of sub-committees and working groups shall not be the view of the Grid Code Committee unless discussed and agreed by the Grid Code Committee.

GC.6 General principles for the amendment of the GCPM

GC.6.1 Proposals

GC.6.1.1 Any member of the Grid Code Committee can submit a proposal for an amendment to the Grid Code.

GC.6.1.2 Each proposal shall:

(a) be in writing;

(b) be set out in reasonable but not excessive detail the nature and purpose of the proposal;

(c) be submitted to the Secretary of the Grid Code Committee no less than twenty-five (25) Business Days prior to the next meeting; and

(d) be placed on the agenda for discussion by the members at the next meeting.

GC.6.1.3 The proposal shall be presented at a duly convened meeting of the Grid Code Committee, to the Grid Code Committee members by the proposer member, who shall endeavour to answer any initial questions which the other members may have in respect of the proposal or the presentation.

GC.6.1.4 The Chairperson and the Secretary will notify the Grid Code Committee members of the proposed amendment no less than fifteen (15) Business Days in advance of the next scheduled Grid Code Committee meeting.

GC.6.1.5 The Grid Code Committee shall discuss the proposal.

GC.6.1.6 The GC Change Administrator shall record the views of the Grid Code Committee through a round table statement of each member's position.

GC.6.1.7 Having:

(a) heard the presentation of the proposing member;

(b) discussed the proposal;

(c) had an opportunity to ask questions of the proposing member in respect of the proposal; and

(d) had their position recorded by the GC Change Administrator,

the Chairperson taking into account the views of the Grid Code Committee may determine that the proposal:

(a) does not merit any further consideration; or

(b) merits further consideration.

GC.6.1.8 If the Chairperson considers that the proposal merits further consideration, the Grid Code Committee may request or appoint a working group to prepare a proposal for the amendment detailing the specific clauses of the Grid Code that should be amended and the text of the proposed amendment within a set timescale.

GC.6.1.9 The working group shall report to the Grid Code Committee at each meeting of the Grid Code Committee as to the progress of the working group.

GC.6.1.10 Any final amendments proposed by the working group to the Grid Code Committee shall include changes to a specific clause and all other affected clauses, the original proposal and the views and considerations of the Grid Code Committee members.

GC.6.1.11 Throughout the amendment procedure, the GC Change Administrator shall:

(a) follow up and provide support to the working group;

(b) monitor the progress of the proposal and in respect of the time frame;

(c) regularly inform the Chairperson and the Secretary of the progress of the proposal.

GC.6.2 The decision of the Grid Code Committee and the recommendations of the working group with regard to the proposed amendments will be circulated in writing by the GSO to all parties holding a Licence issued by Commission which are liable to be materially affected in relation to any proposed amendments to the Grid Code for comment within four (4) weeks. On completion of consultation, the GSO shall submit all proposed amendments to the Grid Code to the Grid Code Committee for final agreement and submission for approval by the Commission.

GC.6.3 All presentations and views associated with a proposed amendment will be made at the Grid Code Committee meeting or through written comments during the consultation process. It is the duty of the User providing such written comments to circulate such comments made during the consultation process to the members of the Grid Code Committee.

GC.6.4 Following the agreement on any proposed amendment, it will be submitted to the Commission for approval and an effective date for the implementation of the revision to the Grid Code will be set by the Commission. It is recognised that in rare cases it may be necessary to establish interim arrangements until the new amended version of the Grid Code becomes effective. It is the duty of the Chairperson of the Grid Code Committee to notify each User of the effective date.

GC.6.5 Urgent amendment

GC.6.5.1 The Commission may decide that an amendment to the Grid Code is urgent.

GC.6.5.2 An urgent amendment should be linked to an issue that if not urgently addressed may cause:

(a) a significant commercial impact on the GSO, the Users or other stakeholder(s);

(b) a significant impact on the safety and security of the Grid system; or

(c) a User to be in breach of any relevant legal requirements.

GC.6.5.3 In case of an urgent amendment proposal declared by the Commission, the procedure described in the section GC 6.4 applies, but the deadlines could be shortened. The Chairperson, in coordination with the Secretary and the GC Change Administrator, ensures that the shortest possible deadlines are met while maintaining a satisfactory level of consultation with the Grid Code Committee members. The urgent amendment proposal has priority on the agenda of the Grid Code Committee meetings.

GC.6.6 Records and implementation

GC.6.6.1 The Secretary of the Grid Code Committee has a duty to hold appropriate records of the amendments to the Grid Code through an auditable version control process. Appropriate versions and controlled copy markings will be included and any uncontrolled copies without these markings will be regarded as invalid.

GC.6.6.2 The latest version of the Grid Code will be published by the GSO on the GSO's website and by the Commission on the Commission's website. A hardcopy version of the Grid Code is available on request from the GSO. Controlled copies of the Grid Code are maintained at both the offices of the GSO and the Commission.

GC.7 External Audit on GSO and Single Buyer Operations

GC.7.1 The Grid Code Committee shall appoint an independent External Auditor to perform the following functions:

(a) to review the GSO and Single Buyer operations,

(b) to review the performance of the GSO and the Single Buyer in complying with the provisions of the Grid Code (especially relating to scheduling);

(c) to prepare and submit operational reviews to the Grid Code Committee and Commission;

(d) to evaluate and make recommendations on significant grid events; and

(e) to identify difficulties observed in implementing the Grid Code and make necessary recommendations to the Grid Code Committee.

GC.7.2 The rules and procedures for the functions of the External Auditor shall be formulated by the Grid Code Committee and approved by the Commission.

GC.7.3 The External Auditor shall have sufficient technical background and experience in Grid operations. The appointment of the External Auditor shall be as and when required.

GC.7.4 The GSO shall provide secretarial support to the External Auditor.

GC.8 Non-Compliance

GC.8.1 If the User fails to fulfill the provisions established in the Grid Code, it shall be considered a non-compliance situation in accordance with section 50E of the Act 447.

GC.9 Unforeseen Circumstances

GC.9.1 The Grid Code contains procedures under which the GSO, in pursuance of its obligations will receive information from Users relating to the intentions of such Users in the course of planning and operating the Grid System.

GC.9.2 If circumstances arise which the provisions of the Grid Code have not foreseen, the GSO shall, to the extent reasonably practicable in the circumstances, consult promptly and in good faith all affected Users in an effort to reach an agreement as to what should be done. If an agreement between the GSO and those Users cannot be reached in the time available, the GSO shall determine what actions, if any, should be taken and shall notify the Commission of this determination as soon as practicable thereafter.

GC.9.3 Wherever the GSO makes a determination, it shall do so having regarded, in any event, what is reasonable in all the circumstances with Grid System security and safety taking precedence at all times.

GC.9.4 Each User shall comply with all instructions given to it by the GSO following such a determination, provided that the instructions are consistent with the current technical parameters of the particular User's System registered under the Grid Code. The GSO shall promptly refer all such unforeseen circumstances and any such determination to the Commission for consideration and thereafter to the Grid Code Committee in accordance with GC.5.1.2 (5).

GC.10 Remedy

GC.10.1 It is the sole responsibility of a User to verify its continual compliance with any provision of the Grid Code. In cases where a User finds it will be unable to comply with or that it is predicted or developing non-compliance of any provision of the Grid Code ("non-compliance"), then it shall, without delay, report such non-compliance to the Commission and the GSO who will in turn inform the Grid owner and the Single Buyer. It is extremely important for the GSO to be made aware of any non-compliance as this may cause the GSO to make operational decisions which may jeopardise the integrity and safety of parts or the whole of the Grid System.

GC.10.2 The User will promptly discuss with the GSO the proposed remedy to restore compliance and the GSO will identify the interim operational measures required to ensure secure operation of the Grid System. Additonally, for cases involving remediation more than 6 months to restore compliance the User and the GSO will then submit the agreed solution and timescales to complete the remedy to the Commission for approval. The Commission may request the User and the GSO to report the progress of the remedy.

GC.10.3 This process should be completed on an urgent basis so that all measures to the remedy are in place and the additional costs to the Grid System are minimized.

GC.10.4 The affected parties shall act, in the interest of safety of the Grid System and try to follow the instructions of the GSO in this regard due to technical constraints on part of the affected parties.

GC.10.5 The non-compliance may be with reference to Plant and Apparatus:

(a) which is already connected to the Grid System and is caused by solely or mainly as a result of a revision to the Grid Code;which is already connected to the Grid System and is caused by a developed or developing partial defect and where the Plant and Apparatus may remain operable albeit with some operational constraints or at reduced capability; and

(b) which is seeking approval for connection to the Grid System.

GC.10.6 In cases where a User believes that remedying such non-compliance is unreasonable for technical or financial reasons or requires an extended period to remedy such non-compliance, it shall promptly submit a request to the Commission with a copy to the GSO to varify certain provisions in the or an extension to the period for implementing the remedy.

GC.10.7 If the GSO finds that it is or will be unable to comply with any provision of the Grid Code at any time, then it shall notify the Commission promptly with a proposal and a timescale for remedy.

GC.11 Request to vary and Issue Process

GC.11.1 A request to vary any provision of the Grid Code ("vary") from the Grid Owner or a User shall contain:

(a) the reference to the particular Grid Code provision against which the particular non-compliance or the predicted or developing non-compliance was identified;

(b) the particulars of the Plant and/or Apparatus in respect of which a request to vary is being sought;

(c) the reason, nature, extent and impact of the non-compliance;

(d) the predicted period of non-compliance and the timescale by which full compliance could be achieved; and

(e) the reason for and impact of extended periods of non-compliance if full compliance cannot be achieved for technical or financial reasons.

GC.11.2 On receipt of any request to vary, the Commission shall promptly consider and discuss the request with the Grid Owner, the User, the GSO and the Grid Code Committee. In considering the request to vary, the Commission would fully take into account the views of the GSO and the Grid Code Committee on whether the provisions to be varied would, or is likely to:

(a) have material and adverse impact on the security and/or stable operation of the Grid System; or

(b) impose high or unreasonable costs on the operation of the Grid System.

GC.11.3 Dependent upon the nature of the request to vary being sought, provisions may be varied with a time limit or for a long-term by the Commission subject to full agreement of the GSO being able to continue to fulfil its duties for the secure and economic operation of the Grid System.

GC.11.4 In consideration of a request to vary by the Grid Owner or a User, the Commission may seek all necessary clarification and external expert assistance in making its determination.

GC.11.5 To the extent of any provision is varied in accordance with this GC.10, the party or parties shall be relieved from any obligation to comply with the applicable provision of the Grid Code and shall not be liable for failure to comply but shall comply with the provisions varied.

GC.11.6 It is the duty of both the GSO and the Commission to keep comprehensive respective registers of all provisions varied with respect to the Grid Owner and/or Users. These registers shall contain fully detailed account of the nature of the provisions varied and its effective period. The GSO shall also provide copies of the registers to the Single Buyer.

GC.11.7 It is the duty of both the GSO and the Commission to annually review the provisions varied and take into account of any material changes in the circumstances if such a change has occurred.

GC.11.8 The Grid Owner and/or Users may request a review of any provision that has been varied.

GC.12 Request to vary for Existing Contracts or Agreements

GC.12.1 If any contract, agreement or arrangement exists at the date this Grid Code comes into force, the Commission shall make a determination whether the technical conditions of the specific contract, agreement or arrangement are in line with the provisions of the Grid Code in consultation with the GSO and the Single Buyer.

GC.12.2 If the technical conditions of the specific contract, agreement or arrangement are not in line with the provisions of the Grid Code, then the Grid Code shall prevail.

GC.12.3 If the technical conditions of the specific contract, agreement or arrangement preclude compliance with certain provisions of the Grid Code, then an appropriate request to vary provisions shall be requested by the User from the Commission. After consultation with the GSO and the Single Buyer, the Commission may accept or refuse to vary provisions requested by the User.

GC.12.4 Provisions that has been varied does not release the Derogated Party from compliance with all other provisions of the Grid Code and the provisions of any

commercial agreement or from any commercial liability arising from such technical varied provisions.

GC.13 Illegality and Partial Invalidity

GC.13.1 If any provision of the Grid Code is found to be wholly or partially unlawful or invalid for any reason, the validity of the remaining provisions of the Grid Code shall remain unaffected.

GC.13.2 If part of a provision of the Grid Code is found to be unlawful or invalid for any reason but the rest of such a provision would remain valid if part of the wordings were deleted, the provision shall apply with such minimum modification as may be:

(a) necessary to make it valid and effective; and

(b) most closely achieves the result of the original wording but without affecting the meaning or validity of any other provision of the Grid Code.

GC.13.3 In cases mentioned in GC.13.2, the GSO shall prepare a proposal for correcting the default for consideration by the Grid Code Committee.

GC.14 Notices Under the Grid Code and Communication

GC.14.1 Instructions by the GSO

GC.14.1.1 Unless otherwise specified in the Grid Code, all instructions, other than SCADA instructions, given by the GSO and communications (other than relating to the submission of data and notices) between the GSO and Users (other than Generators) shall take place between the Control Engineer based at the GSO Control Centre notified by the GSO to each User prior to connection, and the relevant Users' Responsible Engineer/Operator, who will be based at the Control Centre or Location notified by the User to the GSO prior to connection, subject to the agreement of the GSO.

GC.14.1.2 Unless otherwise specified in the Grid Code, all instructions, other than SCADA instructions, given by the GSO and communications (other than relating to the submission of data and notices) between the GSO and the Generators shall take place between the Control Engineer based at the GSO Control Centre notified by

the GSO to each Generator prior to connection, and the relevant Generator's Control Point notified to the GSO by the Generator, subject to agreement of the GSO. In the absence of notification to the contrary, the Control Point of a Generator's Power Station will be deemed to be the Power Station at which the Generating Units or Power Park Modules are situated.

GC.14.1.3 In the case of SCADA instructions, these will be sent directly to the Generating Unit or Power Park Module or Equipment or Plant or Apparatus as the case may be to which the instruction relates.

GC.14.1.4 Unless otherwise specified in the Grid Code, all instructions, other than SCADA instructions, given by the GSO and communications (other than relating to the submission of data and notices) between the GSO and the Users will be given by means of the Control Telephony or by Facsimile transmission or agreed electronic means referred to in Connection Code CC6.6.

GC.14.1.5 If the GSO Control Centre or the User's Control Center or the Generator's Control Room is moved to another location, whether due to an emergency or for any other reason, the GSO shall notify the relevant User or the User shall notify the GSO, as the case may be, of the new location and any changes to the Control Telephony necessitated by such move, as soon as practicable following the move.

GC.14.1.6 The recording (by whatever means) of instructions or communications given by means of Control Telephony will be accepted by the GSO and Users as evidence of those instructions or communications.

GC.14.2 Data and Notices

GC.14.2.1 Any data and notices to be submitted or given under the Grid Code (other than data which is the subject of a specific requirement of the Grid Code as to the manner of its delivery) shall be in writing duly signed by or on behalf of a person duly authorised to do so by the party submitting or giving the data or notice and delivered by hand, sent by post, or by e-mail to the relevant person in accordance with a pre-determined protocol.

GC.14.2.2 The GSO shall maintain a master list of all contact details for itself and all Users containing the telephone, e-mail and postal addresses enabling unfettered communication at all times both under normal, exceptional and emergency operational conditions. It is the duty of all parties to ensure prompt notification of any changes in their contact details to all other parties. The GSO has the duty of

keeping this master list up to date and promptly circulating any changes to all parties.

GC.14.2.3 Any data or notice (other than data which is the subject of a specific requirement of the Grid Code as to the manner of its delivery) sent under this Grid Code shall be deemed to have been given or received—

(a) at the time of delivery, if sent by hand;
(b) unless otherwise proven, within four (4) Business Days after posting if sent by recorded delivery;
(c) subject to confirmation by transmission report, if sent by email; or
(d) subject to receipt of confirmation report from the receiving party, or otherwise the Business Day after the e-mail has been sent.

The GSO shall establish a Communication Protocol with auditable acknowledgement of receipt of communication by all parties who are the recipients of the data or notice.

GC.14.2.4 All data items, where applicable, will be referenced to nominal parameters such as nominal Voltage and Frequency unless otherwise stated.

GC.15 Ownership of Plant and Apparatus

GC.15.1 References in the Grid Code to Plant and/or Apparatus of a User include Plant and/or Apparatus used by a User under any agreement with a third party.

GC.16 Grid Code Disputes

GC.16.1 If any dispute arises between the Grid Owner, Users, Single Buyer and/or the GSO in relation to this Grid Code, either party may by following the procedures under GC.13 give notice to the other seeking to resolve the dispute by negotiation in good faith and without prejudice. If the parties fail to resolve any dispute, then either party may refer the matter to the Commission for determination. In this case the Commission shall determine the dispute itself unless it feels there are cogent reasons to refer the dispute to arbitration.

GC.16.2 In cases where the Commission decides to determine a dispute itself, the practice and procedure to be followed in the determination of any dispute shall be in accordance with the relevant provisions provided under the Electricity Supply Act 1990 [*Act 447*]. Any order in resolution of a dispute made by the Commission may

include a provision requiring either party to pay costs or expenses incurred by the Commission in determining the dispute.

GC.16.3 If the Commission refers the dispute for arbitration, the Commission shall serve a written notice to the parties on the dispute to that effect and the rules of arbitration of the Regional Centre of Arbitration Kuala Lumpur (RCAKL) shall apply.

GC.16.4 Any arbitration conducted in accordance with GC.16.3 shall be conducted in Kuala Lumpur, in English, by a single arbitrator in accordance with the laws of Malaysia.

GC.16.5 Where the Grid Code provides that any dispute or difference between parties in relation to a particular matter should be referred to an expert for resolution, such dispute or difference may not be referred to arbitration unless and until such expert determination has been sought and obtained.

GC.17 Grid Code Confidentiality

GC.17.1 Parts of this Grid Code specify the extent of confidentiality which applies to data supplied by Users to the Grid Owner and the GSO and by the Grid Owner and the GSO to Users. Unless otherwise specifically stated in the Grid Code, the Grid Owner and the GSO shall be obliged to share defined data with Users and the Single Buyer likely to be affected by the matters concerned and with the Commission.

GC.18 Applicable Law

GC.18.1 The law applicable to this Grid Code shall be the Laws of Malaysia.

<END OF PART II: GENERAL CONDITIONS>

Part III: Main Planning Code

MPC.1 Introduction

MPC.1.1 The Planning Code (PC) specifies the technical and design criteria and procedures to be applied by the Grid Owner, the Single Buyer and the GSO in the planning and development of the Grid System and to be taken into account by Users in the planning and development of their own User Systems and their connections to the Grid System. It provides information to be supplied by Users to the Single Buyer and to the Grid Owner and certain information to be supplied by the Grid Owner and the Single Buyer to Users. It shall be the responsibility of the Grid Owner and Single Buyer to provide to the GSO with the relevant information required for operational planning.

MPC.1.2 The Planning Code also specifies the procedures to be applied by the Single Buyer and the Grid Owner in preparing the generation adequacy and capacity requirements for the next ten (10) succeeding years and to notify the Commission of these requirements, as specified in PC.5.3.

MPC.1.3 The Users referred to above are defined, for the purpose of the PC, in MPC.3.1.

MPC.1.4 The development of the Grid System involving its reinforcement or extension, may arise for a number of reasons which can include, but not limited to –

(a) a development of a User System already connected to the Grid System;

(b) the introduction of a new Connection Site or the Modification of an existing Connection Site between a User System and the Grid System;

(c) the cumulative effect of a number of such developments referred to above in (1) and (2) by one or more Users.

MPC.1.5 Accordingly, the reinforcement or extension of the Grid System may involve work at the following locations:

(a) at a substation at a Connection Site where User's Plant and/or Apparatus is connected to the Grid System;

(b) on transmission lines or other facilities that connect the said Connection Site to the remainder of the Grid System; and

(c) on transmission lines or other facilities at or between points remote from that Connection Site.

MPC.1.6 The time required for the planning and development of the Grid System will depend on the type and extent of the necessary reinforcement and/or extension work, the need or otherwise for statutory planning consent, wayleave (rentice) acquisition, the associated possibility of the need for a public inquiry and the degree of complexity in undertaking the new work while maintaining satisfactory security and quality of supply on the existing Grid System.

MPC.1.7 Since the planning and development of the Grid System requires sufficient lead time to allow for any necessary consent to be obtained and detailed engineering design/construction work to be completed, this Planning Code imposes an appropriate timescale on the exchange of information between the Grid Owner and Users, subject to all parties having regard, where appropriate, to the confidentiality of such information as specified in this PC.

MPC.2 Objectives

MPC.2.1 The objectives of the Planning Code are:

(a) to promote interaction between the Grid Owner, Single Buyer, GSO and Users regarding any proposed development on the User Systems which may impact the performance of the Grid System or the direct connection with the Grid System;

(b) to provide for the supply of information required by the Single Buyer and the Grid Owner from Users in order for the Grid Owner and the Single Buyer to undertake the planning and development of the Grid System in accordance with the relevant License Standards, to facilitate existing and proposed connections, and also to provide for the supply of certain information from the Grid Owner to Users and from Users to the Grid Owner in relation to short circuit current contributions and other relevant information;

(c) to specify the Licence Standards, which will be used by the Grid Owner and the Single Buyer in the planning and development of the Grid System;

(d) to provide for the supply of information by the Single Buyer required by the Commission of the future generation adequacy and capacity

(including energy storage) requirements and the notification of the Commission on an annual basis or as required by the Commission; and

(e) to provide sufficient information to the Commission on the optimal points for connection to the Grid System.

MPC.3 Scope

MPC.3.1 The PC applies to the Grid Owner, GSO, Single Buyer and following Users:

(a) the Generators;

(b) the Distributors;

(c) the Network Operators;

(d) the Grid Connected Customers;

(e) the Parties seeking connection to the Grid System or on to a User System;

(f) the Energy Storage Operators;

(g) the Aggregators; and

(h) the Retailers.

MPC.3.2 The above categories of User will become bound by the PC prior to them generating, supplying, or consuming, as the case may be, and references to the various categories (or to the general category) of User should, therefore, be taken as referring to them in that prospective role as well as to Users actually connected to the Grid System.

MPC.3.3 It is the responsibility of each User to keep the Grid Owner, and the Single Buyer informed of all changes, and supply all required information in accordance with the requirements of the PC.

MPC.3.4 In the case of Embedded Power Stations, unless otherwise provided, the following provisions apply with regard to the provision of data under this PC:

(a) each Generator shall provide the data directly to the Grid Owner;

(b) although data is not normally required specifically on Embedded type A (as defined in MCC.3.3) Generating Power Stations under this PC, each Distributor and Network Operators in whose System it is Embedded should provide the data contained in DRC.7 to the Grid Owner if:

(i) it is required by the Grid Owner to be supplied pursuant to the application for a connection or modification of a connection with the Distributor or Network Operator as the case may be; or

(ii) it is specifically requested by the Grid Owner in the circumstances provided for under this PC.

MPC.3.5 Certain data does not normally need to be provided for certain Embedded Power Stations, as provided in DRC.7.5.

MPC.3.6 The Single Buyer is responsible for the preparation of the future generation adequacy and capacity requirements and the notification to the Commission on an annual basis or as required by the Commission, as in PC5.3. All Users and appropriate Government Agencies shall provide all the information required by the Single Buyer to enable the preparation of the calculation as required by the Commission to the timescales specified by the Commission to the Single Buyer.

MPC.3.7 Any information relating to the changes on an existing Interconnection and the potential establishment of a new Interconnection will be between the Grid Owner, the Single Buyer and the Commission. The Grid Owner and the Single Buyer shall take appropriate account of these changes and new connections in planning the development of the system. The Single Buyer shall also take appropriate account of these changes in the preparation of generation adequacy and capacity requirements.

<END OF PART III : MAIN PLANNING CODE>

Part IV: Main Connection Code

MCC.1 Introduction

MCC.1.1 The Connection Code (CC) specifies both the minimum technical, design and operational criteria which must be complied with by any User connected to or seeking connection with the Grid System or Generators (other than type A Generating Module, as defined in the MCC.3.3) connected to or seeking connection to a User's System which is located in Peninsular Malaysia. The CC also lays out the minimum technical, design and operational criteria with which the Grid Owner and GSO as well as the Users will ensure compliance in relation to the part of the Grid System at the Connection Site with Users.

MCC.2 Objectives

MCC.2.1 The objective of this CC is to ensure that by specifying minimum technical, design and operational criteria the basic rules for connection to the Grid System and/or to a User's System are similar for all Users of an equivalent category and will enable the Grid Owner and GSO as well as the Users to comply with their statutory and Licence obligations.

MCC.2.2 No connection, existing, new, modified or to be modified shall impose unacceptable effects upon the Grid System or on any User System nor will it be the cause of unacceptable effects by its connection to the Grid System. In this respect unacceptable effects are all effects that cause the Grid Owner and GSO as well as any User to violate the Licence Standards and to become non-compliant with the Grid Code Statutory and Licence obligations.

MCC.3 Scope

MCC.3.1 The CC applies to the Grid Owner and GSO, the Single Buyer and to Users, which in this CC means:

(a) the Grid Owner;

(b) the Distributors;

(c) the Network Operators;

(d) the Grid Connected Customers;

(e) the Parties seeking connection to the Grid System or on to a User System;

(f) the Generators

(g) the Energy Storage Units Operators, which are connected to the Grid through power electronic devices. They generate or consume electricity; and

(h) the Retailers.

MCC.3.2 The above categories of User will become bound by the CC prior to them generating, supplying or consuming, as the case may be, and references to the various categories should, therefore, be taken as referring to them in that prospective role as well as to the connected Users.

MCC.3.3 A Generating Module is categorized as a Type A or a Type B Generating Module as follows:

Category Type A:

For a Generating Module connected to the grid through inverters, the threshold is less than 10 MW.

For a Generating Module with conventional thermal or hydro Generating unit/s, the threshold for each unit is less than 30 MW.

For the Generating Module with more than one Generating Unit, the aggregated MW Capacity threshold is 50 MW, without any Generating Unit greater than or equal to 30 MW.

Category Type B:

Any Generating Module or Energy Storage Unit greater than or equal to the above thresholds is considered as Type B.

< END OF PART IV : MAIN CONNECTION CODE>

Part V: Main Operating Codes

MOC.1 The Operating Codes comprise of the following:

(a) Operating Code No. 1 (OC1): Demand Forecast;

(b) Operating Code No. 2 (OC2): Outage and Other Related Planning;

(c) Operating Code No. 3 (OC3): Operating Reserves and Response;

(d) Operating Code No. 4 (OC4): Demand Control;

(e) Operating Code No. 5 (OC5): Operational Liaison;

(f) Operating Code No. 6 (OC6): Significant Incident Reporting;

(g) Operating Code No. 7 (OC7): Emergency Operations;

(h) Operating Code No. 8 (OC8): Safety Coordination;

(i) Operating Code No. 9 (OC9): Numbering and Nomenclature;

(j) Operating Code No. 10 (OC10): Periodic Testing and Supervising; and

(k) Operating Code No. 11 (OC11): System Tests.

Main Operating Code No.1 (MOC1): Demand Forecast

MOC1.1 Introduction

MOC1.1.1 Operating Code No.1 (OC1) is concerned with the Demand forecasting for operation purposes. In order to match generation output with Demand for electricity it is necessary to undertake Demand forecasting of Active Energy, Active Power and Reactive Power for operational purposes.

MOC1.1.2 This OC1 outlines the obligations on the GSO, Single Buyer and Users regarding the preparation of Demand forecasts of Active Energy, Active Power and Reactive Power on the Grid System. This OC1 sets out the time scales within the Operational Planning, Programming, and Operational Control phases in which Users shall provide demand forecasts to the GSO and Single Buyer so that the relevant operational plans can be prepared.

MOC1.1.3 In this OC1, Year 0 means the current year at any time, Year 1 means the next year at any time, Year 2 means the year after Year 1. For operational purposes, each year will be considered to start on the 1st of January.

MOC1.1.4 The Demand forecasting periods and timeframes are defined by the Single Buyer in specific guidelines.

MOC1.1.5 In the Operational Planning Phase and Programming Phase, Demand forecasting shall be conducted by the Single Buyer taking account of Demand forecasts furnished by Users who shall provide the Single Buyer with Demand forecasts and other information as outlined in OC1.4.

MOC1.1.6 In the Operational Control Phase, the GSO shall refine the Demand forecasting taking into account any revised information provided by Users and the other factors referred to in OC1.4.

MOC1.1.7 The GSO and Single Buyer shall share between each other the Demand forecasts performed under their own responsibility.

MOC1.2 Objectives

MOC1.2.1 The objectives of this Code are to:

(a) ensure the provision of data to the GSO and Single Buyer by Users for operation purposes; and

(b) provide for the factors to be taken into account by the GSO and Single Buyer when Demand forecasting is conducted in operation.

MOC1.3 Scope

MOC1.3.1 This Code applies to the GSO, Single Buyer and the following Users:

(a) the Generators connected to the Grid System;

(b) the Grid Connected Customers;

(c) the Network Operators;

(d) the Distributors;

(e) the Energy Storage Operators;

(f) the Aggregators;

(g) the Retailers; and

(h) the Interconnected Parties.

<END OF THE MAIN OPERATING CODE NO 1: DEMAND FORECAST>

Main Operating Code No.2 (MOC2): Outage and Other Related Planning

MOC2.1 Introduction

MOC2.1.1 Operating Code No. 2 (OC2) is concerned with the coordination between the GSO and Users through the various time scales of planned outages of Plant and Apparatus on User's Systems which may affect the operation of the Grid System and/or require the commitment of (alternative) resources by the GSO.

MOC2.1.2 In this OC2, Year 0 means the current year at any time, Year 1 means the next year at any time, Year 2 means the year after Year 1, Year 3 means the year after Year 2, Year 4 means the year after Year 3, Year 5 means the year after Year 4. For operational purposes, each year will be considered to start on the 1st of January.

MOC2.1.3 The time scales involved in OC2 are from Year 5 down to the one–day ahead which cover Operational Planning down to the start of the Operational Control Phase.

MOC2.2 Objectives

MOC2.2.1 The objectives of OC2 are:

(a) to enable the GSO to coordinate generation and transmission outages to achieve economic operation and minimise constraints;

(b) to set out procedure including information required and a typical timetable for the coordination of planned outage requirements for Generators;

(c) to set out procedure including information required and a typical timetable for the coordination of planned outage requirements for other Users that will have an effect on the operation of the Grid System; and

(d) to establish the responsibility of the GSO to produce an Outage Plan for the Grid System.

MOC2.3 Scope

MOC2.3.1 This Code applies to the GSO and the following Users:

(a) the Generators connected to the Grid System;

(b) the Grid Owner;

(c) the Distributors;

(d) the Grid Connected Customers;

(e) the Network Operators;

(f) the Energy Storage Operators;

(g) the Aggregators; and

(h) the Interconnected Parties.

<END OF THE MAIN OPERATING CODE NO 2: OUTAGE AND OTHER RELATED PLANNING>

Main Operating Code No.3 (MOC3): Operating Reserves and Response

MOC3.1 Introduction

MOC3.1.1 The Grid System is required to be operated by the GSO with sufficient Operating Reserve to account for such factors as planned and unplanned outages on the Grid System, inaccuracies in Demand forecasting, or sudden loss of generation or load.

MOC3.1.2 Operating Code No. 3 (OC3) describes the different types of reserves that make up the Operating Reserve the GSO might use in real-time operation of the Grid System in order to maintain the required levels of System Security.

MOC3.2 Objectives

MOC3.2.1 The objectives of this Code are:

(a) to describe the types of reserves which shall be utilised by the GSO pursuant to the Scheduling and Dispatch Codes (SDC); and

(b) to identify parameters associated with operating reserves typically required by the GSO.

MOC3.3 Scope

MOC3.3.1 This Code applies to the GSO and the following Users:

(a) the Single Buyer;

(b) the Generators;

(c) the Energy Storage Operators;

(d) the Aggregators; and

(e) the Interconnected Parties;

<END OF THE MAIN OPERATING CODE NO 3: OPERATING RESERVE AND RESPONSE>

Main Operating Code No.4 (MOC4): Demand Control

MOC4.1 Introduction

MOC4.1.1 Operating Code No. 4 (OC4) is concerned with the procedures to be followed by the GSO and Users to facilitate Demand Control in the event that insufficient generating capacity is available to meet forecast or real-time Demand.

MOC4.1.2 Demand Control shall include, but not limited to, the following actions on load or demand:

(a) Automatic Load Shedding;

(b) Manual Load Shedding; and

(c) Reduction of load through voltage reduction.

MOC4.1.3 In addition, these provisions may be used by the GSO to prevent System thermal overloads or to prevent System voltage collapse on any part of the Grid System.

MOC4.1.4 For the avoidance of doubt, Demand Control concerns automatic and manual actions implemented for emergency purpose only and does not include Demand Response services provided by Users according to a specific agreement.

MOC4.2 Objectives

MOC4.2.1 The objectives of this OC4 are to:

(a) enable the provision of facilities to allow the GSO to achieve Demand Control on the Grid System, in whole or in part;

(b) enable the GSO to instruct Demand Control in a manner that does not unduly discriminate against, or unduly prefer, anyone or any group of Users; and

(c) ensure that the GSO is notified of any Demand Control utilised by Users other than following an instruction from the GSO.

MOC4.3 Scope

MOC4.3.1 This OC4 applies to the GSO, and the following Users:

(a) the Network Operators;
(b) the Grid Owner;
(c) the Distributors;
(d) the Grid Connected Customers;
(e) the Energy Storage Operators;
(f) the Aggregators and
(g) the Single Buyer.

<END OF THE MAIN OPERATING CODE NO 4: DEMAND CONTROL>

Main Operating Code No.5 (MOC5): Operational Liaison

MOC5.1 Introduction

MOC5.1.1 Operating Code No. 5 (OC5) sets out the requirements for maintaining communication and for the exchange of information in relation to the operations and/or Events on the Grid System or a User System which have had or may have an Operational Effect on the Grid System or other User Systems.

MOC5.2 Objectives

MOC5.2.1 The objectives of this OC5 are:

(a) to provide for the exchange of information that is needed in order that possible risks arising from the Operations and/or Events on the Grid System and/or User Systems can be assessed and appropriate action taken;

(b) to detail the communication facilities required between the GSO and each category of User;

(c) to provide a framework for information flow and discussion for Commissioning Tests and Compliance tests; and

(d) to detail the general procedures that will be established to authorise personnel who will initiate or carry out operations on the User System.

MOC5.3 Scope

MOC5.3.1 This OC5 applies to the GSO and the following Users:

(a) the Generators;

(b) the Grid Owner;

(c) the Network Operators;

(d) the Distributors;

(e) the Grid Connected Customers where the GSO considers it necessary;

(f) the Energy Storage Operators;

(g) the Aggregators;

(h) the Retailers;

(i) the Interconnected Parties; and

(j) the Single Buyer.

MOC5.3.2 This OC5 does not seek to deal with any actions arising from the exchange of information but rather only with that exchange.

<END OF THE MAIN OPERATING CODE NO 5: OPERATIONAL LIAISON>

Main Operating Code No.6 (MOC6): Significant Incident Reporting

MOC6.1 Introduction

MOC6.1.1 Operating Code No. 6 (OC6) sets out the requirements for reporting of Significant Incidents.

MOC6.2 Objectives

MOC6.2.1 The objective of OC6 is to facilitate the provision of detailed information in reporting Significant Incidents.

MOC6.3 Scope

MOC6.3.1 This OC6 applies to the GSO and the following Users:

(a) the Generators connected to the Grid System;

(b) the Grid Owner;

(c) the Distributors;

(d) the Network Operators;

(e) the Grid Connected Customers where the GSO considers it necessary;

(f) the Energy Storage Operators;

(g) the Aggregators;

(h) the Retailers;

(i) the Interconnected Parties; and

(j) the Single Buyer.

<END OF THE MAIN OPERATING CODE NO 6: SIGNIFICANT INCIDENT REPORTING>

Main Operating Code No.7 (MOC7): Emergency Operations

MOC7.1 Introduction

MOC7.1.1 Operating Code No. 7 (OC7) is concerned with the operation of the Grid System by the GSO under Grid System Emergency conditions.

MOC7.1.2 Grid System Emergencies are applicable in any of the following situations:

(a) a Total Blackout or Partial Blackout of the Grid System;
(b) imminent occurrence of disruption of supply;
(c) the separation of the Grid System into one or more Power Islands;
(d) voltage collapse of part of the Grid System;
(e) the loss of a strategic Generating Module;
(f) fuel supply emergency; or
(g) loss of the GSO Control Centre.

MOC7.2 Objectives

MOC7.2.1 The objectives of this OC7 are:

(a) to ensure that in the event of Grid System Emergencies normal supplies are restored to all Consumers as quickly and as safely as practicable in accordance with Prudent Industry Practice;

(b) to outline the general contingency and restoration strategies which shall be adopted by the GSO in this event; and

(c) to initiate the communication procedures, specified in OC5, between the GSO and relevant Users when Grid System Emergency is anticipated to occur or has occurred.

MOC7.3 Scope

MOC7.3.1 OC7 applies to GSO and the following Users:

(a) the Generators connected to the Grid System;
(b) the Network Operators;
(c) the Distributors;

(d) the Grid Owner;
(e) the Grid Connected Customers where the GSO considers it necessary;
(f) the Energy Storage Operators;
(g) the Aggregators;
(h) the Retailers;
(i) the Interconnected Parties; and
(j) the Single Buyer.

<END OF THE MAIN OPERATING CODE NO 7: EMERGENCY OPERATIONS>

Main Operating Code No.8 (MOC8): Safety Coordination

MOC8.1 Introduction

MOC8.1.1 Operating Code No.8 (OC8) specifies the standard procedures to be used by the GSO and Users for the co-ordination, establishment and maintenance of necessary Safety Precautions when work is to be carried out on the Grid System or a User System and when there is a need for Safety Precautions on HV Apparatus on the other User's System for this work to be carried out safely.

MOC8.1.2 In this OC8, the term "work" includes testing, other than System Tests which are covered by OC11.

MOC8.2 Objectives

MOC8.2.1 The objectives of OC8 are to:

(a) establish the requirement on the GSO and Users (or their contractors) to carry out work on the Grid System or User System respectively in accordance with approved safety regulations; and

(b) ensure safe working conditions for personnel working on or in close proximity to Plant and Apparatus on the Grid System or personnel who may have to work at or use the equipment at the interface between the Grid System and a User System.

MOC8.3 Scope

MOC8.3.1 OC8 applies to the GSO and the following Users:

(a) the Generators connected to the Grid System;

(b) the Network Operators;

(c) the Grid Owner;

(d) the Distributors;

(e) the Grid Connected Customers where the GSO considers it necessary;

(f) the Energy Storage Operators;

(g) the Interconnected Parties; and

(h) any other party or responsible person employed by a User and accepted by the GSO.

MOC8.3.2 The work carried out will normally involve making Apparatus dead, securing associated Plant, including disabling and suitably securing any prime movers, isolating and Earthing that Plant and Apparatus such that it cannot be made live again from the Grid System or subject to mechanical power and the establishing of a safe working area. It also includes the testing of Plant and Apparatus.

MOC8.3.3 Work may also be carried out without making the Apparatus dead and this is termed as Live Apparatus Work usually performed on Transmission lines. For Live Apparatus Work safety precautions and coordination are also required and must be subject to permit to work procedures.

MOC8.3.4 In the case where a User employs another party or a responsible person, the responsibility for safety and all other matters pursuant to this OC8 shall remain the responsibility of the User.

<END OF THE MAIN OPERATING CODE NO 8: SAFETY COORDINATION>

Main Operating Code No.9 (MOC9): Numbering and Nomenclature

MOC9.1 Introduction

MOC9.1.1 Numbering and nomenclature of Apparatus in the Grid System facilitates safe operation and control of the Grid System by the GSO. Operating Code No.9 (OC9) sets out the requirement for numbering and nomenclature of HV Apparatus located in Grid System and User's Systems.

MOC9.1.2 All Apparatus in the Grid System that are and will be under the control of the GSO shall have numbering and nomenclature in accordance with the system specified in this OC9 or as determined by the GSO.

MOC9.1.3 The numbering and nomenclature of each item of HV Apparatus shall be included in the Single Line Diagram prepared for each Site of the Grid Owner or User Site. The numbering and names are also used in the labelling of equipment including towers, apparatus, control panels and diagrams.

MOC9.2 Objectives

MOC9.2.1 The objectives of this OC9 are:

(a) to provide consistent numbering and nomenclature for apparatus in the Grid System; and

(b) to ensure, as much as possible, the safe and effective operation of the Grid System and to reduce the risk of human error faults by requiring, that the numbering and nomenclature of User's HV Apparatus at Grid Supply Points shall be in accordance with the system used by the GSO as specified in this OC9.

MOC9.3 Scope

MOC9.3.1 OC9 applies to the GSO and the following Users:

(a) the Generators;
(b) the Grid Owner;
(c) the Distributors;
(d) the Network Operators;

(e) the Grid Connected Customers; and

(f) the Energy Storage Operators.

<END OF THE MAIN OPERATING CODE NO 9: NUMBERING AND NOMENCLATURE>

Main Operating Code No.10 (MOC10): Periodic Testing and Supervising

MOC10.1 Introduction

MOC10.1.1 Operating Code No. 10 (OC10) specifies the procedures to be followed by the GSO, Single Buyer and Users in coordinating and carrying out tests and supervising to ensure compliance by Users covering all parts of the Connection Code as well as Ancillary Service Duties which include but not limited to, response to frequency, reactive capability, fast start capability, House Load and Black Start capability during the operational phase.

MOC10.1.2 The GSO and the Single Buyer are responsible for facilitating and coordinating the required testing and supervising. The User is responsible for carrying out the test and/or supervising in accordance with the relevant Agreement and/or specifications issued by the GSO and the Single Buyer.

MOC10.1.3 Any User or the Single Buyer may propose any of the tests set out in this OC10 or any relevant Agreements to be carried out and such request shall be made to the GSO. The GSO shall consider such request and may approve and facilitate the test with due regard to the safety, security and integrity of the Grid System.

MOC10.2 Objectives

MOC10.2.1 The objectives of OC10 are:

(a) to enable the GSO and the Single Buyer to carry out, facilitate and coordinate testing and/or supervising the Grid System or User's System at the Grid Supply Point to ensure compliance;

(b) to enable the Grid Owner to carry out, facilitate and coordinate investigation User’s System at the Grid Supply Point to ensure compliance;

(c) to establish whether Users comply with the Connection Code; and

(d) to establish whether Generators and Energy Storage Operators can provide those Ancillary Services which they are either required or have agreed to provide under the relevant Agreement.

MOC10.3 Scope

MOC10.3.1 OC10 applies to the GSO, Single Buyer and the following Users:

(a) the Generators;

(b) the Network Operators;

(c) the Grid Owner;

(d) the Distributors;

(e) the Grid Connected Customers;

(f) the Energy Storage Operators;

(g) the Aggregators; and

(h) the Ancillary Services providers.

<END OF THE MAIN OPERATING CODE NO 10: PERIODIC TESTING AND SUPERVISING>

Main Operating Code No.11 (MOC11): System Tests

MOC11.1 Introduction

MOC11.1.1 System Tests are tests which involve either a simulated or a controlled application of irregular, unusual or extreme conditions on the Grid System or User Systems. In addition, the tests could include certain commissioning and/or acceptance tests on Plant and Apparatus to be carried out by the Users which may have a significant impact upon the Grid System, other User Systems or the wider System.

MOC11.1.2 To minimise disruption to the operation of the Grid System and to other User Systems, these tests shall be subjected to central coordination and control by the GSO.

MOC11.1.3 This part does not cover the testing of a minor nature carried out on isolated Systems or those facilitated by the GSO and carried out by Users to assess performance and/or compliance of Users with their design, operating and connection requirements as specified in this Grid Code and in their relevant Agreements. Such items are covered in OC10 on Periodic Testing and Supervising of the Main Grid Code.

MOC11.2 Objectives

MOC11.2.1 The objectives of OC11 are to:

(a) ensure that the procedures for arranging, facilitating and carrying out System Tests do not, so far as is practicable, threaten the safety of personnel or members of the public and minimise the possibility of damage to Plant and/or Apparatus and/or the security of the Grid System;

(b) set out the procedures for preparing and carrying outs System Tests; and

(c) set out the procedures for reporting of System Tests.

MOC11.3 Scope

MOC11.3.1 OC11 applies to the GSO and the following Users:

(a) the Generators with CDGUs;

(b) the Generators with Generating Modules not subject to Dispatch by the GSO, with total on-site generation capacity not less than 30MW where the GSO considers it necessary;

(c) the Energy Storage Operators;

(d) the Grid Owner;

(e) the Distributors;

(f) the Grid Connected Customers where GSO considers it necessary; and

(g) the Interconnected Parties.

<END OF THE MAIN OPERATING CODE NO 11: SYSTEM TESTS>

<END OF PART V: MAIN OPERATING CODE>

Part VI: Main Scheduling and Dispatch Codes

MSDC.1 These Scheduling and Dispatch Codes comprise of the following:

(a) Scheduling and Dispatch Code SDC1 – Unit Scheduling;

(b) Scheduling and Dispatch Code SDC2 – Control, Scheduling and Dispatch; and

(c) Scheduling and Dispatch Code SDC3 – Frequency and Interconnection Transfer Control.

MSDC1: Main SDC1: Unit Scheduling

MSDC1.1 Introduction

MSDC1.1.1 Scheduling the operations of units is a major component of operations plans. Scheduling of the units depends upon the pattern of demand by the system, the Least Cost operation of Grid System, the availability, parameters and costs of Generating Units and Energy Storage Units and Aggregators, the flexibility of operation of Generating Units, constraints on the Grid System, security requirements, and System losses.

MSDC1.1.2 Scheduling and Dispatch Code No.1 (SDC1) sets out the procedure for:

(a) the daily notification by the Generators of the Availability of any of their CDGU in an Availability Declaration;

(b) the daily notification of whether there is any CDGU which differs from the last Generating Unit Scheduling and Dispatch Parameters (SDP), in respect of the following Schedule Day by each Generator in a SDP Notice;

(c) the daily notification by the Energy Storage Operators of the availability of their power import and export capacity;

(d) the daily notification by Aggregators of the availability of their aggregated Demand Response units;

(e) the monthly, weekly and daily notification of Power export availability or import requests and price information by Interconnected Parties to the GSO and Single Buyer;

(f) the submission of certain Network data by each User with a Network directly connected to the Grid System to which Generating Units are connected (to allow consideration of Network constraints);

(g) the submission of certain Network data by Users with a Network directly connected to the Distribution Network to which Generating Units are connected (to allow consideration of distribution restrictions);

(h) the Agreement on Power and Energy flows between Interconnected Parties by the Single Buyer following discussions with the GSO; and

(i) the production of a Least Cost Unit Schedule which schedule, for the avoidance of doubt, in this SDC1 means unit commitment and generation Dispatch level.

MSDC1.2 Objectives

MSDC1.2.1 The objectives of SDC1 are to enable the Single Buyer to prepare a schedule based on a Least Cost Dispatch model (or models) which, amongst other things, models variable costs, price data, fuel price data, heat rate data, gas volume and pressure constraints, other fuel constraints, reservoir lake level, and ripairian requirement, and allows hydro/thermal optimisation and is used in the Scheduling and Dispatch process and thereby:

(a) ensures the integrity of the interconnected Grid System;
(b) ensures the security of supply;
(c) ensures that there is sufficient available generating Capacity to meet Grid System Demand as often as is practicable with an appropriate margin of reserve;
(d) enables the preparation and issue of a Least Cost Unit Schedule;
(e) enables optimisation of the total cost of Grid System operation over a specific period taking into account scheduled and forced outages, and factors (6), (7), and (8) of this SDC1.2;
(f) enables optimisation of the use of generating and transmission capacities;
(g) enables use of Energy from hydro-power stations to optimise system marginal costs taking due account of reservoir levels, ripairian requirements and seasonal variations, which are based upon long term water inflow records; and
(h) maintains sufficient solid and liquid fuel stocks, optimises hydro reservoir depletion and to meet fuel-contract requirement. In cases where fuel prices are subsidized, the price to be used for scheduling shall be the price decided by the government.

MSDC1.3 Scope

MSDC1.3.1 SDC1 applies to the GSO, Single Buyer and the following Users:

(a) the Generators with a CDGU;
(b) the Grid Owner;
(c) the Interconnected Parties;
(d) the Distributors;
(e) the Network Operators;
(f) the Grid Connected Customers who can provide Demand Response in real time;

(g) the Energy Storage Operators; and

(h) the Aggregators.

<END OF THE MAIN SCHEDULING AND DISPATCH CODE 1>

Main SDC2: Control, Scheduling and Dispatch

MSDC2.1 Introduction

MSDC2.1.1 The Scheduling and Dispatch Code No 2 (SDC2) sets out the procedure for the GSO:

(a) to issue Dispatch instructions to Generators in respect of their CDGUs;

(b) to issue Dispatch instructions to Energy Storage Operators;

(c) to issue Dispatch instructions to Aggregator;

(d) to optimise overall Grid System operations for the Scheduled Day; and

(e) to issue instructions in relation to Ancillary Services.

(f) To issue instruction to parties involved in TPA

MSDC2.2 Objective

MSDC2.2.1 This procedure is for the issue of Dispatch instructions to Generators, Energy Storage Operators, Aggregators, confirmation, approval and execution of transfers with Interconnected Parties, by the GSO, with an appropriate margin of reserve, whilst maintaining the integrity of the Grid System together with the necessary security of supply.

MSDC2.2.2 It also provides the procedure to implement the Least Cost Schedule as may be required in the reasonable opinion of the GSO in real time.

MSDC2.3 Scope

MSDC2.3.1 SDC2 applies to the GSO, Single Buyer and to Users which in SDC2 are:

(a) the Generators with a CDGU;

(b) the Energy Storage Operators;

(c) the Aggregators;

(d) the Grid Owner;

(e) the Interconnected Parties;

(f) the Distributors;

(g) the Network Operators; and

(h) the Grid Connected Customers who can provide Demand Response in real time.

<END OF THE MAIN SCHEDULING AND DISPATCH CODE 2>

Main SDC3: Frequency and Interconnection Transfer Control

MSDC3.1 Introduction

MSDC3.1.1 SDC3 sets out the procedure for the GSO to use in relation to Users to undertake the direction of System Frequency control. System Frequency will normally be controlled by AGC signals sent from the GSO Control Centre.

MSDC3.1.2 Frequency may also be controlled by Demand Response.

MSDC3.1.3 The requirements for Frequency control are determined by the consequences and effectiveness of generation Scheduling and Dispatch. Accordingly, SDC3 is complementary to SDC1 and SDC2.

MSDC3.2 Objective

MSDC3.2.1 The procedure for the GSO to direct System Frequency Control and is intended to enable (as far as possible) the GSO to meet the statutory requirements of System Frequency Control, and to manage tie line control in accordance with relevant Agreements with Interconnected Parties.

MSDC3.3 Scope

MSDC3.3.1 SDC3 applies to the GSO and to Users which in SDC3 are:

(a) the Generators with a Generating Module;

(b) the Energy Storage Operators;

(c) the Aggregators;

(d) the Grid Owner;

(e) the Interconnected Parties;

(f) the Distributors;

(g) the Network Operators; and

(h) the Grid Connected Customers who can provide Demand Response in real time.

<END OF MAIN SCHEDULING AND DISPATCH CODE 3>

<END OF PART VI: MAIN SCHEDULING AND DISPATCH CODES>

Part VII: Main Data Registration Code

MDRC.1 Introduction

MDRC.1.1 The Data Registration Code (DRC) presents a unified listing of all data required by the Grid Owner, Single Buyer and GSO from Users and by Users from the Grid Owner, Single Buyer and GSO. When requirement of data is mentioned in a section of the Grid Code, it refers to the DRC to detail the list of required data. Where there is any inconsistency in the data requirements under any particular section of the Grid Code and the Data Registration Code, the provisions of the Data Registration Code shall prevail.

MDRC.1.2 The DRC identifies the section of the Grid Code under which each item of data is required.

MDRC.1.3 The DRC specifies procedures and timings for the supply of that data, for routine updating and for recording temporary or permanent changes to that data.

MDRC.2 Objective

MDRC.2.1 The objective of the DRC is to list and collate all the data to be provided by each category of User to Single Buyer, Grid Owner and GSO under the Grid Code.

MDRC.3 Scope

MDRC.3.1 The DRC applies to the GSO, Grid Owner, Single Buyer and the following Users, which in this DRC means:

(a) the Generators (other than those which only have Embedded type A Power Station);

(b) the Distributors;

(c) the Network Operators;

(d) the Energy Storage Operators;

(e) the Aggregators;

(f) the Grid Connected Customers; and

(g) the Parties seeking connection to the Grid System or on to a User's System.

<END OF PART VII : MAIN DATA REGISTRATION CODE>

Part VIII: Main Metering Code

MMC.1 Introduction

MMC.1.1 The Metering Code sets out the metering requirements relating to Active Power, Reactive Power and Active Energy and Reactive Energy for all Users connected to or seeking connection to the Grid System.

MMC.2 Objectives

MMC.2.1 The objective of the Metering Code (MC) is to ensure that all the technical requirements relating to metering Active and Reactive Power and Active Energy and Reactive Energy for all Users enabling the Single Buyer in respect of revenue metering , and the Users to comply with statutory and Licence obligations. The Code includes the installation and maintenance of metering equipment, collection of Metering Data for Billing, testing requirements for Meters and Metering Installations, security of and access to Metering Data, and requirements of the Metering Register.

MMC.2.2 As part of its objectives, the Metering Code includes:

(a) the details of the minimum requirements for the measurement and recording of electrical quantities required by Revenue Metering that will be used for settling electricity contracts;

(b) the provisions relating to the procurement, installation, testing, maintenance, and operation of Metering Installations including the associated Plant and Apparatus and communication links, for the measurement of electrical Active and Reactive Power and Active Energy and Reactive Energy and the provision of data for the commercial operation of the Grid System;

(c) the accuracy requirements and the parameters to be measured.

MMC.2.3 The Metering Code recognises the evolving metering technologies and processes as they become available and does not preclude application of such technologies provided that such applications are effected in consultation between the GSO, the Single Buyer and the User, in accordance with the

provisions of the Metering Code and without causing unacceptable effects by its connection to the Grid System. In this respect unacceptable effects are all effects which cause the Single Buyer and GSO as well as any User to violate the Licence Standards and to become non-compliant with this Grid Code, statutory and Licence obligations.

MMC.3 Scope

MMC.3.1 The MC applies to the GSO, Single Buyer and to Users, which in this MC refers to:

(a) the Generators;

(b) the Energy Storage Operators;

(c) the Distributors;

(d) the Network Operators;

(e) the Grid Connected Customers;

(f) the Users seeking connection to Grid System or to a User System;

(g) the Externally Interconnected Parties; and

(h) the Grid Owner.

<END OF PART VIII : MAIN METERING CODE>

Part IX: Main Cybersecurity Code

MCSC.1 Introduction

MCSC.1.1 Cybersecurity risk management is crucial for maintaining the continuity and security of electricity supply. The purpose of establishing common rules is to ensure that continuous compliance are being applied and practiced uniformly across relevant systems by Users. Industry governance, planning and collaboration are central to dealing with the aftermath of a cyber-attack, especially in an interconnected system.

MCSC.1.2 This Cybersecurity Code (CSC) establishes specific rules for Cybersecurity aspects of the Grid System in accordance with the Electricity Supply Act 1990 [*Act 447*].

MCSC.2 Objectives

MCSC.2.1 The Cybersecurity rules defined in the CSC have the following objectives:

(a) to contribute to protect the Critical National Information Infrastructure (CNII) and to reduce the Vulnerability of the Grid System;

(b) to elevate Cybersecurity awareness for the Grid Owner, the GSO, the Single Buyer and the Users of the Grid System, by providing basic rules for continuous improvement processes and training against Cyber Threats;

(c) to develop a governance framework for Cybersecurity within the Grid Code;

(d) to help build Cyber Resilience of the Grid System; and

(e) to strengthen the Cybersecurity regulatory framework.

MCSC.3 Scope

MCSC.3.1 The CSC applies to the Grid Owner, GSO, Single Buyer and the following Users:

(a) the Generators connected to the Grid System;

(b) the Distributors;

(c) the Network Operators;

(d) the Grid Connected Customers;

(e) the Energy Storage Operators; and

(f) the Aggregators.

<END OF PART IX: MAIN CYBERSECURITY CODE>


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