SULTANATE OF OMAN

The Distribution Code

Version 1.1

April, 2020

Muscat Electricity Distribution Company SAOC

Mazoon Electricity Company SAOC

Majan Electricity Company SAOC

Dhofar Power Company SAOC

The Distribution Code

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The Distribution Code

Preface

This document is the Distribution Code referred to in the Sector Law and the licences dated [ ] granted by the Regulatory Authority to [Muscat Distribution Company SAOC, Mazoon Distribution Company SAOC, Majan Distribution Company SAOC and Dhofar Power Company SAOC] (collectively, Licensed Distributors) under that Law. It contains rules in relation to the Connection to, Operation and maintenance of and changes to the Distribution Systems of Licensed Distributors.

The Distribution Code applies to all Persons who are Connected to and/or use or may use the Distribution Systems of Licensed Distributors. Each constituent part of the Distribution Code specifies which Persons it applies to. This Distribution Code is uniform in respect of all relevant Distribution Systems, except to the extent specifically provided for in the Distribution Code.

Terms and expressions used in the Distribution Code are defined in the relevant sections of the Distribution Code entitled "Glossary and Abbreviations" or “Definitions”.

The Distribution Code contains the following constituent parts;

- General Conditions;
- Distribution Data Transfer Code;
- Distribution Connection Conditions Code;
- Distribution Planning Code;
- Distribution Operating Codes;
  - DOC1 Demand Forecasting;
  - DOC2 Operational Planning;
  - DOC3 Demand Control;
  - DOC4 Notice of Operations and Incidents, and Significant Incident Reporting;
  - DOC5 Safety Coordination;
  - DOC6 Contingency Planning;
  - DOC7 Numbering and Nomenclature;
  - DOC8 System Tests;
- Glossary and Abbreviations;
- Definitions.

This Distribution Code shall not constitute a contract between any of the parties to it. Some of these parties may have contractual obligations, created by separate documents (including Connection Agreements), to each other to comply with the code.

Nothing in this code shall entitle any party to it or any other Person to any contractual or other general Law right or remedy of whatsoever kind and howsoever arising in respect of this Distribution Code. Each party's liability to each other party shall be limited to one (1) Omani Rial.

However, nothing in this Distribution Code (including this paragraph) shall affect any legal right or remedy that may exist between any two parties to this Distribution Code under any such separate agreement between or any duty arising under the terms of any Licence granted pursuant to the [title of Sector Law] or pursuant to that Law. In particular, nothing in this Distribution Code shall preclude the Regulatory Authority from taking such enforcement action in relation to it, the [insert title of Sector Law] or any Licence granted thereunder as it sees fit.

Each party to this Distribution Code shall at all times deal with all other parties in good faith. All parties to the Distribution Code shall at all times perform all of their obligations in accordance with Good Industry Practice.

Where the Distribution System User is a Power Producer subject to Central Dispatch, the Distribution System User shall accede to and comply with the Grid Code, in so far as the Grid Code is applicable to it.

General Conditions

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General Conditions

DGC.1 Introduction

The individual sections of the Distribution Code contain rules and provisions relating specifically to that individual section of the Distribution Code. There are also provisions of a more general application, which need to be included in the Distribution Code to allow the individual sections of the Distribution Code to work together. Such provisions are included in these General Conditions.

DGC.2 Objective

The objectives of the General Conditions are;

- to ensure, insofar as it is possible, that the various sections of the Distribution Code work together for the benefit of the Licensed Distributors and all Distribution System Users; and
- to provide a set of principles governing the status and development of the Distribution Code and related issues as approved by the Regulatory Authority.

DGC.3 Scope of Distribution Code and General Conditions

The General Conditions apply to Licensed Distributors and to all Parties to the Distribution Code.

DGC.4 Distribution Code Review Panel

The Chairman shall establish and maintain the Distribution Code Review Panel which shall be a standing body constituted to;

- generally review, discuss and develop the Distribution Code and its implementation;
- ensure that the Distribution Code at all times and in all respects meets the requirements of the Licenses of each Licensed Distributor;
- review and discuss suggestions for amendments to the Distribution Code which Licensed Distributors, the Regulatory Authority, or any User may wish to submit to Licensed Distributors for consideration by the Distribution Code Review Panel from time to time;
- discuss what changes are necessary to the Distribution Code arising out of any unforeseen circumstances referred to it by Licensed Distributors;
- to review existing Oman Electrical Standards relevant to the Distribution Systems of Licensed Distributors and make recommendations to the Regulatory Authority concerning modifications to existing Oman Electrical Standards or proposals for new Oman Electrical Standards relevant to the Distribution Systems of Licensed Distributors;
- to determine which contractors should be approved to work on the Distribution Systems of Licensed Distributors;

- to approve equipment that may be used on or form part of the Distribution Systems of Licensed Distributors;
- publish recommendations and ensure that Distribution System User consultation upon such recommendations has occurred through Distribution Code Review Panel Members; and
- issue guidance in relation to the Distribution Code and its implementation, performance and interpretation when asked to by a Distribution System User.

The Distribution Code Review Panel shall be governed by a constitution, (given as Appendix A) which defines its scope, Membership, duties, and rules of conduct and operation as approved by the Regulatory Authority.

The Panel shall consist of;

- 1 Person appointed by each Licensed Distributor;
- 1 Person appointed by the Regulatory Authority;
- 1 Person appointed by PWP;
- 1 Person representing those Power Producers having Embedded Production Facilities;
- 1 Person representing OETC;
- 1 Person representing Internally Interconnected Parties Connected to Licensed Distributor Distribution Systems; and
- 1 Person representing Consumer interests.

The Chairman will be appointed by the Members appointed to the Panel by the Licensed Distributors and shall also be one of the Licensed Distributor Members of the Panel.

DGC.5 Distribution Code Revisions

The Distribution Code Review Panel must review all revisions to the Distribution Code prior to application to the Regulatory Authority. All proposed revisions from Users, the Regulatory Authority or Licensed Distributors will be brought before the Distribution Code Review Panel by the Chairman for consideration. The Chairman will advise the Distribution Code Review Panel, all Distribution System Users, Licensed Distributors and the Regulatory Authority of all proposed revisions to the Distribution Code with notice of no less than 20 Business Days in advance of the next scheduled meeting of the Distribution Code Review Panel.

Following review of a proposed revision by the Distribution Code Review Panel, the Chairman will apply to the Regulatory Authority for revision of the Distribution Code based on the Distribution Code Review Panel recommendation. The Chairman in applying to the Regulatory Authority shall also notify each Licensed Distributor and Distribution System User of the proposed revision and other views expressed by the Distribution Code Review Panel and Distribution System Users so that each party may consider making representations directly to the Regulatory Authority regarding the proposed revision.

The Regulatory Authority shall consider the proposed revision, other views, and any further representations and shall determine whether the proposed revision should be made and, if so, whether in the form proposed or in an amended form.

Having been so directed by the Regulatory Authority that the revision shall be made, the Chairman shall notify each Distribution System User of the revision at least 10 Business Days prior to the revision taking effect, and the revision shall take effect (and this Distribution Code shall be deemed to be amended accordingly) from (and including) the date specified in such notification or other such date as directed by the Regulatory Authority.

DGC.6 Derogations

If a Distribution System User finds that it is, or will be, unable to comply with any provision of the Distribution Code, then it shall, without delay, report such non-compliance to the Licensed Distributor and shall make such reasonable efforts as are required to remedy such non-compliance as soon as reasonably practicable.

When a Distribution System User believes either that it would be unreasonable (including on the grounds of cost and technical considerations) to require it to remedy such non-compliance or that it should be granted an extended period to remedy such non-compliance, it shall promptly submit to the Regulatory Authority a request for derogation from such provision and shall provide the relevant Licensed Distributor with a copy of such application.

If a Licensed Distributor finds that it is, or will be, unable to comply with any provision of the Distribution Code at any time, then it shall make such reasonable efforts as are required to remedy such non-compliance as soon as reasonably practicable.

In the case where Licensed Distributors request derogation, they shall submit the information set out in DGC.6.1 to the Regulatory Authority.

DGC.6.1 A Request for Derogation

A request for derogation from any provision of the Distribution Code shall include;

- the issue reference and the date of the Distribution Code provision to which the non-compliance or predicted non-compliance was identified;
- detail of the Plant in respect of which derogation is sought and, if relevant, the nature and extent of non-compliance;
- the provision of the Distribution Code with which the Distribution System User is, or will be, unable to comply;
- the reason for the non-compliance; and
- the date by which compliance could be achieved (if remedy of the non-compliance is possible).

On receipt of any request for derogation, the Regulatory Authority shall promptly consider such request and provided that the Regulatory Authority considers that the grounds for derogation are reasonable, then the Regulatory Authority shall grant such derogation unless derogation would, or is likely to have a material adverse impact on the security and stability of the Distribution System or impose unreasonable costs on the Operation of the Distribution System or on other Distribution System Users. In its consideration of a derogation request by a Distribution System User, the Regulatory Authority may contact the relevant Distribution

System User and/or Licensed Distributors to obtain clarification of the request or to discuss changes to the request.

Derogations from any provision of the Distribution Code shall contain;

- the issue reference and the date of the Distribution Code provision to which the derogation applies;
- detail of the Plant in respect of which a derogation applies and, if relevant, the nature and extent to which the derogation applies including alternative compliance provisions;
- identification of the provision of the Distribution Code with which the derogation applies;
- the reason for the non-compliance requiring derogation; and
- the date by which the derogation shall expire.

To the extent of any derogation granted in accordance with this DGC.6, Licensed Distributors and/or the Distribution System User (as the case may be) shall be relieved from any obligation to comply with the applicable provision of the Distribution Code and shall not be liable for failure to so comply with the applicable provision but shall comply with any alternative provisions identified in the derogation.

Each Licensed Distributor shall;

- keep a register of all derogations which have been granted, identifying the name of the Person in respect of whom the derogation has been granted, the relevant provision of the Distribution Code and the period of the derogation; and
- on request from any Distribution System User, provide a copy of such register of derogations to such Distribution System User.

The Regulatory Authority may initiate at the request of a Licensed Distributor or Distribution System User a review of any existing derogations, and any derogations under consideration where a relevant and material change in circumstance has occurred.

DGC.7 Unforeseen Circumstances

If circumstances arise which the provisions of the Distribution Code have not foreseen, the Chairman shall to the extent reasonably practicable in the circumstances, consult all affected Distribution System Users in an effort to reach agreement as to what should be done and submit a proposal to the Distribution Code Review Panel for consideration.

If a Licensed Distributor and affected Distribution System Users are not able to agree, the Licensed Distributor will take any action necessary to ensure that it meets its License conditions wherever practical taking into account the views expressed by the Distribution System Users.

Thereafter, the Licensed Distributor shall refer the matter relating to the unforeseen circumstances and any such determinations to the Distribution Code Review Panel with a proposal for consideration.

DGC.8 Hierarchy

In the event of any irreconcilable conflict between the provisions of the Distribution Code and any contract, agreement, or arrangement between Licensed Distributors and a Distribution System User;

- if the contract agreement or arrangement exists at the date this code first comes into force, it shall, unless and to the extent (1) specifically provided for in the Distribution Code or in the contract agreement or arrangement or (2) that the User has agreed to comply with the Distribution Code prevail over this Distribution Code for two years from the date upon which this Code is first in effect;
- the Grid Code shall prevail over this Distribution Code; and
- in all other cases, the provisions of the Distribution Code shall prevail unless the Distribution Code expressly provides otherwise.

Without prejudice to the rules in DGC.6 entitling it to propose changes to this Distribution Code, the PWP shall ensure that all agreements entered into by it in respect of new Capacity from Embedded Gensets and the output from that new Capacity;

- require the provider of the new Capacity to accede and adhere to the Distribution Code; and
- are consistent with the Distribution Code in all material respects.

DGC.9 Illegality and Partial Invalidity

If any provision of the Distribution Code should be found to be unlawful or wholly or partially invalid for any reason, the validity of all remaining provisions of the Distribution Code shall not be affected.

If part of a provision of the Distribution Code is found to be unlawful or invalid but the rest of such provision would remain valid if part of the wording were deleted, the provision shall apply with such minimum modification as;

- may be necessary to make it valid and effective; and
- most closely achieves the result of the original wording

but without affecting the meaning or validity of any other provision of the Distribution Code.

DGC.10 Time of Effectiveness

This Distribution Code shall have effect, as regards a new Distribution System User;

- at the time specified in its Connection Agreement; or
- if no such time is specified in its Connection Agreement, at the time at which its Connection Agreement comes into effect.

DGC.11 Code Notices

Any notice to be given under the Distribution Code shall be in writing and shall be duly given if signed by or on behalf of a Person duly authorised to do so by the party giving the notice and delivered by hand at, or sent by post, or facsimile transmission or e-mail to the relevant address, facsimile number or e-mail address last established pursuant to these General Conditions.

Each Licensed Distributor shall maintain a list of contact details for itself and all Distribution System Users Connecting to its Network containing the telephone, facsimile, e-mail and postal addresses for all Distribution System Users. These details shall be provided by the Licensed Distributor to any Distribution System User in respect of any other Distribution System User as soon as practicable after receiving a request.

Licensed Distributors and all Distribution System Users shall be entitled to amend in any respect their contact details previously supplied and the Licensed Distributor shall keep the list up to date accordingly.

Any notice required to be given by this Distribution Code shall be deemed to have been given or received;

- if sent by hand, at the time of delivery;
- if sent by post, from and to any address within Oman, 4 Business Days after posting unless otherwise proven; or
- if sent by facsimile, subject to confirmation of uninterrupted transmission report, or by e-mail, one hour after being sent, provided that any transmission sent after 14:00 hours on any day shall be deemed to have been received at 8:00 hours on the following Business Day unless the contrary is shown to be the case.

DGC.12 Code Disputes

If any dispute arises between Distribution System Users or a Licensed Distributor and any Distribution System User in relation to this Distribution Code, either party may by notice to the other seek to resolve the dispute by negotiation in good faith.

If the parties fail to resolve any dispute by such negotiations within 14 days of the giving of a notice under the previous paragraph then;

(a) either party shall be entitled by written notice to the other to require the dispute to be referred to a meeting of Members of the boards of directors of the parties or, if no such directors are present in Oman, the most senior executive of each party present in Oman;

(b) if either party exercises its right under the sub-clause 12(a),each party shall procure that the relevant senior executives consider the matter in dispute and meet with senior executives of the other party within 14 days of receipt of the written notice of referral to attempt to reach agreement on the matter in question; and

(c) if the parties fail to resolve any dispute which has been referred to directors/senior executives under sub-clause 12(a), either party may refer the matter to the Regulatory Authority for determination as the Regulatory Authority sees fit. All parties shall be bound by any decision of the Regulatory Authority. If it sees fit the Regulatory Authority may;

i) determine the dispute itself; or

ii) refer the dispute for determination by arbitration.

If the dispute is referred by the Regulatory Authority to arbitration, the Regulatory Authority shall serve a written notice on the other party to that effect and the Rules of Conciliation and Arbitration of the International Chamber of Commerce (the “ICC Rules”) shall govern such arbitration save to the extent that the same are inconsistent with the express provisions of this Distribution Code.

Any arbitration conducted in accordance with this clause DGC.12 shall be conducted;

- in the city of Muscat in Oman;
- in English; and
- by a panel comprising an odd number of arbitrators provided that (i) there shall be not fewer than three arbitrators (ii) each of the parties to the dispute shall appoint an arbitrator and (iii) the Regulatory Authority shall appoint one arbitrator if there is an even number of parties to the dispute (in which case, the Regulatory Authority's appointee shall act as chairman of the panel) or two arbitrators if there is an uneven number of parties to the dispute (in which case the Regulatory Authority shall nominate one of its appointees to act as chairman of the panel).

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

The Regulatory Authority shall have the right to require that all disputes which are referred to it in accordance with paragraph 12(c) above and are related, whether between the same parties or not, shall be consolidated and determined together either by the Regulatory Authority or by any arbitrator to which the Regulatory Authority has referred any dispute.

Any arbitral award made shall be final and binding on the parties.

DGC.13 Code Confidentiality

Several parts of the code specify the extent of confidentiality, which applies to data supplied by Distribution System Users to the Licensed Distributors. Unless otherwise specifically stated in the code, Licensed Distributors shall be at liberty to share all data with Distribution System Users likely to be affected by the matters concerned and with the PWP. In all cases, Licensed Distributors are at liberty, and may be required, to share the data with the Regulatory Authority.

DGC.14 Interpretation

In this Distribution Code, unless the context otherwise requires;

- references to "this Distribution Code" or "the Distribution Code" are references to the whole of the Distribution Code, including any schedules or other documents attached to any part of the Distribution Code;
- the singular includes the plural and vice versa;
- any one gender includes the others;
- references to code sections, paragraphs, clauses or schedules are to code sections, paragraphs, clauses or schedules of this Distribution Code unless specifically referenced otherwise;
- code, paragraph and schedule headings are for convenience of reference only and do not form part of and shall neither affect nor be used in the construction of this Distribution Code;
- reference to any Law, regulation made under any Law, standard, secondary legislation, contract, agreement or other legal document shall be to that item as amended, modified or replaced from time to time. In particular, 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;
- references to the consent or approval of the Regulatory Authority shall be references to the approval or consent of the Regulatory Authority in writing, which may be given subject to such conditions as may be determined by the Regulatory Authority, as that consent or approval may be amended, modified, supplemented or replaced from time to time and to any proper order, instruction or requirement or decision of the Regulatory Authority given, made or issued under it;
- 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 to the day commencing on such date;
- where a word or expression is defined in this Distribution Code, cognate words and expressions shall be construed accordingly;
- references to "Person" or "Persons" include individuals, firms, companies, government agencies, committees, departments, Ministries and other incorporate and unincorporated bodies as well as to individuals, with an a separate legal personality or not;
- the words "include", "including" 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;
- terms and expressions defined in the Sector Law shall have the same meanings in this Distribution Code;

Appendix A Constitution of the Distribution Code Review Panel

1. Definitions and Interpretation

1.1 The following words and expressions shall have the following meanings in this Constitution:-

"**Chairman**" means the Person appointed under Clause 6 of this Constitution to act as the chairperson of the Panel.

"**Constitution**" means the constitution and rules of the Panel as set out herein and as may be amended from time to time with the approval of the Regulatory Authority.

"**Distribution Licence**" means a Licence to distribute electricity granted pursuant to the Sector Law.

"**Distribution Code**" means the Distribution Code drawn up pursuant to Condition [ ] of the Distribution License.

"Licence" has the meaning given it in the Sector Law.

"**Member**" means a Person appointed to act as a representative of the Persons or groups referred to in Clause 3 on the Panel.

"**Panel**" means the Distribution Code Review Panel established by the Licensed Distributors in accordance with the Distribution Code (section GC.4) and governed by this Constitution.

"**Secretary**" means the Person appointed by the Chairman pursuant to Clause 7, and named as such.

"**Sector Law**" means Sultani Decree No. [/2003] promulgating the law governing the privatization and regulation of the electricity sector in Oman.

"**OETC**" means the Oman Electricity Transmission Company in its capacity as holder of a Transmission Licence.

1.2 Except as otherwise provided herein and unless the context otherwise admits, words and expressions used herein shall have the meanings given to them in the Distribution Code.

1.3 Words importing the singular only also include the plural and vice versa where the context requires. Words importing the masculine only also include the feminine.

1.4 Headings and titles shall not be taken into consideration in the interpretation or construction of the words and expressions used herein.

1.5 Unless otherwise stated, any reference to a Clause is a reference to a Clause of this Constitution.

2. Principal objects

2.1 The Panel has been established by the Licensed Distributors to further the objectives set out below and such other objectives as the Regulatory Authority may stipulate from time to time;

- generally review, discuss and develop the Distribution Code and its implementation;
- ensure that the Distribution Code at all times and in all respects meets the requirements of the Licenses of each Licensed Distributor;
- review and discuss suggestions for amendments to the Distribution Code which Licensed Distributors, the Regulatory Authority, or any User may wish to submit to Licensed Distributors for consideration by the Distribution Code Review Panel from time to time;
- discuss what changes are necessary to the Distribution Code arising out of any unforeseen circumstances referred to it by Licensed Distributors; to review existing Oman Electrical Standards relevant to the Distribution Systems of Licensed Distributors and make recommendations to the Regulatory Authority concerning modifications to existing Oman Electrical Standards or proposals for new Oman Electrical Standards relevant to the Distribution Systems of Licensed Distributors;
- to determine which contractors should be approved to work on the Distribution Systems of Licensed Distributors;
- to approve equipment that may be used on or form part of the Distribution Systems of Licensed Distributors;
- publish recommendations and ensure that Distribution System User consultation upon such recommendations has occurred through Distribution Code Review Panel Members; and
- issue guidance in relation to the Distribution Code and its implementation, performance and interpretation when asked to by a Distribution System User.

3. Membership and Appointment

3.1 The Panel shall comprise;

(a) the Chairman, who shall be one of the Members appointed by the Licensed Distributors;

(b) 1 Person appointed by each Licensed Distributor;

(c) 1 Person appointed by the Regulatory Authority;

(d) 1 Person appointed by PWP;

(e) 1 Person representing those Power Producers having Embedded Production Facilities;

(f) 1 Person representing OETC;

(g) 1 Person representing Internally Interconnected Parties Connected to Distribution Systems; and

(h) 1 Person representing Consumer interests.

3.2 Each Person appointed as specified at Clause 3.1 shall be a Member of the Panel. If at any time any of the Persons or groups identified at Clauses 3.1(a) to (h) are unable to agree on a representative to act as their Member, the Chairman shall contact (insofar as he is reasonably able) the Person(s) or group(s) unable to agree and seek to encourage appointment or, as appropriate, unanimous agreement between relevant Persons as to their prospective Member. If no such agreement is reached at least 21 Business Days prior to the next meeting of the Panel (or the first meeting of the Panel, as the case may be) the Chairman shall request the Regulatory Authority to make such appointment and the Regulatory Authority shall have the right, until the relevant Person or group of Persons has decided upon an appointment and notified the Regulatory Authority and the Chairman accordingly, to appoint a Member or Members on behalf of that Person or group of Persons, and to remove (if appropriate) any Person so appointed by it.

3.3 No Person other than an individual shall be appointed a Member or his alternate.

3.4 After the Panel has been established for one year;

- Each Member shall retire automatically at the beginning of the meeting of the Panel held on the first Business Day in the month of February each year (or if no meeting is held on such day, at the meeting which is held on the date falling closest after that day) but shall be eligible for re-appointment;
- Each Person or group of Persons entitled to appoint a Member (or a Person within such group of Persons) may, by notice in writing to the Chairman, indicate its wish to re-appoint the retiring Member or to appoint a new Person as a Member in his place;
- Such notifications for re-appointment or appointment must be delivered to the Chairman at least 21 Business Days in advance of the relevant meeting of the Panel by the relevant Person(s) or group(s) entitled to appoint a Member. A notification for re-appointment in respect of an existing Member shall be deemed to be given if no notification is delivered to the Chairman at least 21 Business Days in advance of the relevant meeting of the Panel;
- If only one notification is received for the re-appointment of a Member or appointment of a new Person as a Member (or if all notifications received are unanimous), the Person named in the notifications(s) will become the Member with effect from the beginning of the relevant meeting of the Panel. If the notifications are not unanimous, the provisions of Clause 3.2 of this Appendix shall govern the appointment of the Member; and
- These provisions shall apply equally to Persons or groups of Persons entitled to appoint more than one Member, with any necessary changes to reflect that more than one Member is involved.

4. **Alternates**

4.1 Each Member (and the Chairman) shall have the power to appoint any individual to act as his alternate and remove (at his discretion) any alternate Member or Chairman (as the case may be) so appointed. Any appointment or removal of an alternate Member or Chairman shall be effected by notice in writing executed by the appointor and delivered to the Secretary or tendered at a meeting of the Panel.

4.2 If his appointor so requests, an alternate Member or Chairman (as the case may be) shall be entitled to receive notice of all meetings of the Panel or of sub-committees or working groups of which his appointor is a Member. He shall also be entitled to attend and vote as a Member or Chairman (as the case may be) at any such meeting at which the Member or Chairman (as the case may be) appointing him is not personally present and at any such meeting to exercise and discharge all the functions, powers and duties of his appointor as a Member or Chairman (as the case may be) and for the purpose of the proceedings at the meeting the provisions of this Constitution shall apply as if he were a Member or Chairman (as the case may be).

4.3 Every Person acting as an alternate Member or Chairman (as the case may be) shall have one vote for each Member or Chairman (as the case may be) for whom he acts as alternate, in addition to his own vote if he is also a Member or Chairman (as the case may be). Execution by an alternate Member or Chairman (as the case may be) of any resolution in writing of the Panel shall, unless the notice of his appointment provides to the contrary, be as effective as execution by his appointor.

4.4 An alternate Member or Chairman (as the case may be) shall cease to be an alternate Member or Chairman (as the case may be) if his appointor ceases for any reason to be a Member or Chairman (as the case may be).

4.5 References in this Constitution to a Member or Chairman (as the case may be) shall, unless the context otherwise requires, include his duly appointed alternate.

5. Representation and voting

5.1 The Chairman and each other Member shall be entitled to attend and be heard at every meeting of the Panel. One adviser (or such greater number as the Chairman shall permit) shall be entitled to attend any meeting of the Panel with each Member and shall be entitled to speak at any meeting but shall not be entitled to vote on any issue.

5.2 Each Member (including the Chairman) shall be entitled to cast one vote. In the event of an equality of votes, the Chairman shall have a second or casting vote.

6. The Chairman

6.1 The Chairman shall be one of the Members appointed by a Licensed Distributor and shall be elected by the Members representing the Licensed Distributors.

6.2 The representatives of Licensed Distributors may at any time by majority vote remove the Chairman from office.

6.3 The Chairman shall preside at every meeting of the Panel at which he is present. If the Chairman is unable to be present at a meeting, he may appoint an alternate pursuant to Clause 4.1 of this Appendix to act as Chairman. If neither the Chairman nor any other Person appointed to act as Chairman is present within half an hour after the time appointed for holding the meeting, the Members present appointed by the

Licensed Distributors, may appoint one of their number to be Chairman of the meeting.

6.4 The Chairman, or the Person appointed to act as Chairman by the Chairman shall be entitled to cast one vote. Where a Member is acting in the capacity of both Member and Chairman, he shall be entitled to cast one vote as Chairman, in addition to his one vote as Member.

6.5 The Chairman shall resign after one year and the post shall be rotated between the Members appointed by the Licensed Distributors.

7. **The Secretary**

7.1 The Chairman shall have power to appoint and dismiss a Secretary and such other staff for the Panel, as it may deem necessary. The Secretary may, but need not be, a Member, but shall not be a Member by virtue only of being Secretary. The Secretary shall have the right to speak at, but, unless a Member, no right to cast a vote at any meeting.

7.2 The Secretary's duties shall be to attend to the day-to-day operation of the Panel and, in particular, to;

i) attend to the requisition of meetings and to serve all requisite notices;

ii) maintain a register of names and addresses of Members and the Chairman and such alternates as may be appointed from time to time;

iii) maintain a register of names and addresses of Persons in each of the groups of Persons described in sub-clauses 3.1(a) to (h); and

iv) keep minutes of all meetings.

7.3 The Secretary shall make available the register of names and addresses referred to in sub-clauses 7.2(ii) and (iii) above, to Licensed Distributors, Distribution System Users and/or the Regulatory Authority for inspection within a reasonable period of being requested to do so.

7.4 If the office of a Member is vacated the Secretary shall notify (insofar as he is reasonably able) the group or Person whom the Member represented and they shall appoint a new Member as provided in Clause 3 of this Appendix.

8. Meetings

8.1 Subject always to the direction of the Licensed Distributors, acting by majority vote, and the Regulatory Authority, the Panel meetings shall operate as follows;

(a) the Panel shall meet on the first Business Day in the months of May, August, November and February and as necessary for the transaction of business whenever convened by the Chairman at such times as may be determined by the Regulatory Authority, and in any event shall meet not less than 4 times each year;

(b) notwithstanding the right of the Chairman to call a meeting of the Panel whenever appropriate, the Chairman shall call a meeting when requested by a notice in writing to so do by two or more Members;

(c) unless agreed by all Members, not less than 14 Business Days prior written notice shall be given to all Members of all meetings of the Panel;

(d) The quorum of Members required for the Panel meetings shall not be less than 5 of the Members;

(e) if within an hour of the time appointed for a meeting of the Panel a quorum is not present, the meeting shall stand adjourned for at least 2 Business Days. The re-adjourned meeting shall be deemed quorate and its proceedings valid notwithstanding there being fewer than seven Members present; and

(f) subject to sub-paragraphs (d) and (e) above the following circumstances shall not (of themselves) invalidate proceedings of the Panel;

i) vacancies amongst the Panel;

ii) any defects in the appointment of Members; or

iii) the accidental omission to give notice of a Meeting to, or the non-receipt of notice of a meeting by a Person entitled to receive notice.

9. Distribution Code Revisions

9.1 All proposed revisions to the Distribution Code must be reviewed by the Panel prior to their implementation. All revisions proposed by Distribution System Users, the Regulatory Authority or Licensed Distributors shall be brought before the Panel by the Chairman for consideration. The Chairman will advise the Panel, and the Regulatory Authority of all proposed revisions to the Distribution Code with notice of no less than 20 Business Days in advance of the next scheduled meeting of the Panel.

9.2 Following review of a proposed revision by the Panel, the Chairman will, if appropriate, apply to the Regulatory Authority to approve the revision of the Distribution Code based on the Panel's recommendation. The Chairman, in applying to the Regulatory Authority, shall also notify each Distribution System User of the proposed revision and other views expressed by the Panel and Distribution System Users so that each Distribution System User may consider making representations directly to the Regulatory Authority regarding the proposed revision.

9.3 The Regulatory Authority shall consider the proposed revision, other views, and any further representations and shall determine whether the proposed revision should be made and, if so, whether in the form proposed or in an amended form.

9.4 If the Panel is directed by the Regulatory Authority that the revision shall be made, the Chairman shall notify each Distribution System User of the revision at least 10 Business Days prior to the revision taking effect, and the revision shall take effect (and the Distribution Code shall be deemed to be amended accordingly) from (and including) the date specified in such notification or other such date as directed by the Regulatory Authority.

10. Resolutions

10.1 A resolution of the Panel shall be passed by a simple majority of votes cast.

10.2 A resolution in writing signed by all Members shall be as valid and effective as if it had been passed at a meeting of the Panel duly convened and held. Written resolutions

may be produced in one or more counterparts.

10.3 A meeting of the Panel may consist of a conference between Members who are not all in one place but who are able (directly or by telephonic communication) to speak to each of the others and to be heard by each of the others simultaneously. The word "meeting" shall be construed accordingly.

11. Minutes

11.1 The Secretary shall circulate copies of the minutes of each meeting of the Panel to each Member as soon as practicable (and in any event within 15 Business Days) after the relevant meeting has been held.

11.2 Each Member shall notify the Secretary of his approval or disapproval of the minutes of each meeting within 15 Business Days of receipt of the minutes. A Member who fails to do so will be deemed to have approved the minutes. The approval or disapproval of the minutes aforesaid will not affect the validity of decisions taken by the Panel at the meeting to which the minutes relate.

11.3 If the Secretary receives any comments on the minutes, the Secretary shall circulate revised minutes as soon as practicable following the expiry of the period referred to in Clause 11.2 of this Appendix, incorporating those comments which are of a typographical nature and indicating, where necessary, that Members disagree with certain aspects of the minutes. The Secretary shall then incorporate those aspects of the minutes upon which there is disagreement, into the agenda for the next following meeting of the Panel, as the first item for discussion, and, if possible, resolution.

12. Guidance from the Panel

12.1 The Panel may at any time, and from time to time, issue guidance in relation to the Distribution Code and its implementation, performance and interpretation, and it may establish sub-committees and working groups to carry out such work.

13. Sub-committees and working groups

13.1 The Panel 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 Panel may determine. The meetings of sub-committees shall so far as possible be arranged so that the minutes of such meetings can be presented to the Members in sufficient time for consideration before the next following meeting of the Panel.

13.2 The Panel may further establish working groups to advise it on any matter from time to time. Such working groups may consist of Members and/or others as the Panel may determine for the purpose.

13.3 Resolutions of sub-committees and working groups shall not have binding effect unless approved by resolution of the Panel.

14. Removal of Members and Chairman and vacation of office

14.1 The office of a Member shall be vacated if;

(a) he resigns his office by notice delivered to the Secretary;

(b) he becomes bankrupt or compounds with his creditors generally;

(c) he becomes of unsound mind or a patient for any purpose of any statute relating to mental health; or

(d) he or his alternate fails to attend more than three consecutive meetings of the Panel without submitting an explanation to the Chairman which is reasonably acceptable to the Chairman.

14.2 Further, any Person or Persons entitled to appoint a Member or the Chairman, as the case may be, pursuant to Clause 3 may at any time remove that Member or the Chairman, as the case may be, from office and appoint another Person to be a Member or the Chairman, as the case may be, in its place. A Person or Persons will only have the right to remove from office the Member or the Chairman, as the case may be, that it or they have appointed, and will have no right to remove from office any Member or the Chairman, as the case may be, appointed by another Person. Whenever any individual Member or the Chairman changes, the Person or group of Persons entitled to appoint that Member or the Chairman shall notify the Secretary in writing within seven days of the change taking effect.

15. Panel Members: responsibilities and protections

15.1 In the exercise of its powers and the performance of its duties and responsibilities, the Panel shall have due regard for the need to promote the attainment of the principal objects of the Panel set out in Clause 2 of this Appendix.

15.2 In the exercise of its powers and the performance of its duties and responsibilities as a Member, a Member shall represent the interests of that Person or Persons by whom he is for the time being appointed pursuant to Clause 3 of this Appendix, provided that such obligation of representation shall at all times be subordinate to the obligations of the Member as a Member of the Panel set out in Clause 15.1 of this Appendix.

15.3 The Panel, each Member and the Secretary;

i) shall be entitled to rely upon any communication or document reasonably believed by it or him to be genuine and correct and to have been communicated or signed by the Person by whom it purports to be communicated or signed; and

ii) may in relation to any act, matter or thing contemplated by this Constitution act on the opinion or advice of, or any information from, any chartered engineer, lawyer, or Expert in any other field, and shall not be liable for the consequences of so acting.

15.4 The Panel shall enjoy no status, immunity or privilege of the Sultanate of Oman.

However, Members shall not be personally liable in respect of the performance of the functions of the Distribution Code Review Panel.

16. Group representatives' addresses

16.1 Each Member shall from time to time communicate his address to the Secretary and all notices sent to such address shall be considered as having been duly given to such Member.

17. Confidentiality

17.1 Each Member shall keep confidential all information that that Member might reasonably be expected to understand to be confidential.

18. Grid Code Harmony

18.1 OETC shall promptly from time to time propose such amendments to the Distribution Code as may be necessary to ensure that it is and all times remains consistent with the Grid Code.

18.2 Whilst the Panel may recommend the drafting or other matters associated with a change proposed by OETC under 18.1 above, may be improved or might better be addressed in some other manner, it shall ensure that the Distribution Code is and remains consistent with the Grid Code.

19. Interpretation

19.1 References in this Distribution Code to “Licensed Distributors, Licensed Suppliers and Distribution System Users” (whether in the singular or in the plural in each case) shall be construed so that each relevant Person shall have rights or obligations created by this Distribution Code;

(a) in the case of Licensed Distributors, in relation to the Distribution System Users whose Systems are Connected to that Licensed Distributor’s Distribution System and the Licensed Suppliers who use that System; and

(b) as regards Distribution System Users and Licensed Suppliers, in relation to the Licensed Distributor to whose Distribution System their Systems are Connected or whose Distribution System they use.

Distribution Data Transfer Code

CONTENTS

Distribution Data Transfer Code

DDTC.1. Introduction

The Distribution Data Transfer Code (DDTC) provides a unified listing of all data that Distribution System Users are required by the Distribution Code to provide to the Licensed Distributors and that the Licensed Distributors are required to provide to Distribution System Users.

In the event of inconsistencies between this DDTC and other sections of the Distribution Code the provisions in individual sections of the Distribution Code shall prevail.

The relevant code, under which any item of data is required, specifies the procedures, timing, and routing for the supply of that data and the updating and recording of temporary or permanent changes to that data.

DDTC.2. Objective

The objectives of the DDTC are as follows:

- to list and collate all the data to be provided by each category of Distribution System User to the Licensed Distributors under the Distribution Code;
- to list all the data to be provided by the Licensed Distributors to each category of Distribution System User under the Distribution Code; and
- to provide an overview of the data requirements of certain sections of the Distribution Code.

DDTC.3. Scope

In addition to the Licensed Distributors, the DDTC applies to:

- OETC;
- PWP;
- Power Producers with Embedded CDGensets;
- Licensed Suppliers;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- International Interconnected Parties Connected to the Distribution System;
- Internally Interconnected Parties Connected to the Distribution System;
- RAEC if Connected to a Distribution System.

DDTC.4. Data Categories

The DDTC allocates data to a number of categories:

- **Planning Data**: is that data listed in the Planning Code and the Connection Conditions Code required for the purpose of determining any requirements to reinforce the Distribution System;
- **Operational Data**: is data related to Operating Codes (OC) of the Distribution Code. Within the DDTC, Operational Data is sub-categorised according to the relevant Operating Code, namely OC1or OC2;
- **Metering and Data Exchange Code data**: is that data listed in Appendix E Meter Registration data of the Metering and Data Registration Code contained within the Grid Code.

DDTC.5. Procedures And Responsibilities

DTC.5.1. Responsibility for Submission and Updating of Data

In order to assess the implications for making a Connection, the Licensed Distributor will require Planning Data and Operational Data, the precise requirements being decided by the Licensed Distributor and dependant upon the circumstances. Following an agreement to Connect in a Connection Agreement and not less than 6 weeks before the proposed date of Connection, the Distribution System User must supply data as requested by the Licensed Distributor.

Distribution System Users shall submit data listed in the DDTC in accordance with the provisions of relevant sections of the Distribution Code.

DTC.5.2. Methods of Submitting Data

The data schedules to the DDTC are structured to serve as standard formats for submission of data to the Licensed Distributor where possible. Unless the Licensed Distributor has approved otherwise, all data provided by Distribution System Users to the Licensed Distributor and by the Licensed Distributor to Distribution System Users shall be provided in accordance with the DDTC schedule formats.

Data submitted to the Licensed Distributor must include the name of the Distribution System User representative submitting each schedule of data. The data is preferred in electronic format and may be submitted via a computer link if such a data link exists between a Distribution System User and the Licensed Distributor or utilising a data transfer media, such as floppy diskette, magnetic tape, CD ROM etc after obtaining the prior written consent from the Licensed Distributor. If electronic means are not available, subject to the Licensed Distributor’s prior agreement, data to be provided to the Licensed Distributor on a daily basis may be submitted by fax.

DTC.5.3. Changes to Distribution System Users' Data

All Distribution System Users must notify the Licensed Distributor promptly of any change to an item of data that is registered with the Licensed Distributor in accordance with the relevant section of the Distribution Code.

DTC.5.4. Data not Supplied

Distribution System Users and the Licensed Distributor are obliged to provide data as set out in and in accordance with the individual sections of the Distribution Code. If a Distribution System User fails to supply the Licensed Distributor with data required by a section of the Distribution Code, the Licensed Distributor shall use its best estimate of the required data. The Licensed Distributor will advise a Distribution System User in writing of any estimated data it intends to use concerning a Distribution System User's Plant or apparatus in the event that a Distribution System User has not provided the required data.

If the Licensed Distributor fails to provide data required by a section of the Distribution Code, the Distribution System User to whom that data ought to have been supplied will use an estimate of the data not provided by the Licensed Distributor when, in that Distribution System User's view, it is necessary to do so. A Distribution System User will advise the Licensed Distributor in writing of any estimated data it intends to use in the event of data not supplied.

The Licensed Distributor and Distribution System User estimates of data not supplied will, in each case, be based upon data supplied previously for the same Plant or apparatus or upon corresponding data for similar Plant or apparatus or upon such other information as the Licensed Distributor or a Distribution System User, as the case may be, deems appropriate.

DDTC.6. Distribution Code Data Exchanged between the Licensed Distributor and Distribution System Users

Table 6.1 provides details of Schedules A to G of the DDTC. The Licensed Distributor is a party to each Schedule.

Table 6.1: Summary of schedules

Schedule	Data Type	Comprising	User	Distribution Code Section
A	Genset technical data.	General data - All Embedded Gensets;	EPP	DCC DPC
B	Genset technical data.	Technical data. - All Embedded Gensets Connected at 11kV or higher voltage;	EPP	DCC DPC Grid Code PC
C	Demand data	Forecast and historic demand data;	EPP LS OCP	DOC1
D	Operational Planning	Planned Genset, Distribution System User System and Distribution System Outages;	EPP LS LD OCP	DOC2
E	System design data	Reactive compensation, fault infeed data and System network data;	LS LD OCP OETC	DPC
F	Load characteristic data	Data relating to Demand, and Load characteristics and size;	EPP LS OCP	DCC
G	Metering data	Metering locations, details and associated data.	EPP LS LD OCP	Grid Code MDEC

Key to Users

	User
PWP	Power and Water Procurer
OETC	Transmission System Operator
EPP	Power Producers with Embedded Generating Plant
LD	Other Licensed Distributors
LS	Licensed Suppliers
OCP	Other Connected parties: Users Connected to the Distribution System excluding PP, LD, LS, and EPP

Abbreviations used in all Schedules:

DCC	Distribution Connection Conditions Code
DPC	Distribution Planning Code
MDEC	Meter and Data Exchange Code (Grid Code)
DOC	Operating Codes
Grid Code PC	Planning Code (Grid Code)
SDC	Scheduling and Dispatch Codes (Grid Code)

Schedule A Genset Data - For All Embedded Gensets

The following details are required from each Distribution System User with existing or proposed Embedded Gensets, Connected, or to be Connected, to the Distribution System.

Production Facility Name:..... .

Data description	Units	Data	Code category
Terminal volts	KV		DCC
Rated Capacity kVA	KVA		DCC
Rated Capacity kW	KW		DCC
Maximum Active Power sent out	KW		DCC
Reactive Power required	kVAr		DCC
Type of prime mover	Text		DCC
Type of Generating Plant; Synchronous, asynchronous, etc;	Text		DCC
Anticipated operating regime;	Text		DCC
Fault level contribution;	MVA		DCC
Method of voltage control;	Text		DCC
Generator transformer details;	Text		DCC
Requirements for top-up supplies and/or standby supplies;	Text		DCC
Interface Arrangements			DCC
The means of Synchronisation between the Licensed Distributor and Distribution System User;	Text		DCC
Details of arrangements for Connecting with earth that part of the User System Connected to the Distribution System;	Text		DCC
The means of Connection and disconnection which are to be employed;	Text		DCC
Precautions to be taken to ensure the continuance of safe conditions should any earthed neutral point of the User System operated at HV become disconnected from earth;	Text		DCC

Schedule B Additional Genset Data for All Embedded Gensets Connected at 11kV or higher voltage

The following details are required from each Distribution System User with existing or proposed Embedded Gensets, Connected, or to be Connected, to the Distribution System.

Production Facility Name:..... .

Data description	Units	Data					Code category
Genset number		**PF**	**U1**	**U2**	**U3**	**U4**	
Production Facility (PF)							
Rated MW at Registered Capacity;	MW						DCC
Rated MW at Minimum Generation;	MW						DCC
Auxiliary demand at Registered Capacity conditions. Consumers with own Generation should include top-up requirements;	MW MVAr						DCC
Auxiliary demand under Minimum Generation conditions. Consumers with own Generation should include top-up requirements;	MW MVAr						DCC
Individual Genset information							
Rating;	MVA						DCC
Type of excitation system;	Text						DCC
Generator Performance Chart;	Text						DCC
Inertia constant;	MWsec/ MVA						DCC
Stator resistance;	% on MVA						DCC
Direct axis reactance;							
Sub-transient;	% on MVA						DCC
Transient;	% on MVA						DCC
Synchronous;	% on MVA						DCC

Data description	Units	Data					Code category
Genset number		**PF**	**U1**	**U2**	**U3**	**U4**	
Quadrature axis reactance;							
Sub-transient;	% on MVA						DCC
Synchronous;	% on MVA						DCC
Time constants;							
Direct axis sub-transient;	Sec						DCC
Direct axis transient;	Sec						DCC
Quadrature axis sub-transient;	Sec						DCC
Zero phase sequence;							
Resistance;	% on MVA						DCC
Reactance;	% on MVA						DCC
Negative phase sequence;							
Resistance;	% on MVA						DCC
Reactance;	% on MVA						DCC
Generator transformer							
Resistance;	% on MVA						DCC
Reactance;	% on MVA						DCC
MVA rating;							DCC
Tap arrangement;							DCC
Vector group;							DCC
Earthing;							DCC
Automatic Voltage Regulator							
A block diagram for the model of the AVR system including data on the gains, forward and feedback time constants and voltage control limits;	Diagram Text						DCC
Speed governor and prime mover data							
A block diagram for the turbine control system and turbine time constants together with the turbine rating and maximum power;	Diagram Text						DCC

Schedule C Demand Forecasts

The following information is required from Distribution System Users indicated below with Demand Connected to the Distribution System.

Distribution System User Name:.....

	Data Description	Units	Time period covered	Update time	Code category
1. Embedded Power Producers with total on-site Generation Capacity of over 5 MW					
1.1	Maximum and minimum Demands for each week and typical weekly Demand profiles at time of daily peak Demand for each point of Supply;	MW MVAr Time	1 to 3 years	End of November	DOC1
1.2	Maximum and minimum Demands for each day and typical daily Demand profiles for each point of Supply;	MW MVAr Time	1 to 6 weeks	First Satur-day of each month	DOC1
1.3	Any change greater than 1 MW to the data submitted in 1.1. “No change” shall be reported if that is the situation;	MW MVAr Time	0 - 24 hours ahead	by 09:00 hours each day	DOC1
1.4	Active Power and Reactive Power output sent out to the Distribution System by Embedded Generating Plant not subject to Scheduling and Dispatch on an hourly basis;	MW MVAr Time	Previous day	10:00 hours	DOC1
2. Consumers Connected to the Distribution System with a Maximum Demand of over 1 MW					
2.1	Maximum and minimum Demands for each week and typical weekly Demand profiles at time of daily peak Demand for each point of Supply;	MW MVAr Time	1 to 3 years	End of November	DOC1
2.2	Maximum and minimum Demands for each day and typical daily Demand profiles for each point of Supply;	MW MVAr Time	1 to 6 weeks	First Satur-day of each month	DOC1
2.3	Any change greater than 1 MW to the data submitted in 2.1 “No change” shall be reported if that is the situation;	MW MVAr Time	0 - 24 hours ahead	by 09:00 hours each day	DOC1
2.4	Active and Reactive Demand taken from the Distribution System for each hour;	MW MVAr Time	Previous day	10:00 hours	DOC1

	Data Description	Units	Time period covered	Update time	Code category
Licensed Suppliers					
3.1	Total maximum and minimum Demands for each week and typical weekly Demand profiles at time of daily peak Demand;	MW	1 to 3 years	End of October	DOC1
3.2	Demand profiles of the amount and duration of proposed use of Consumer Demand Management that may result in a Demand change of 1MW;	MW Time	1 to 3 years	End of November	DOC1
3.3	Total maximum and minimum Demands for each day and typical daily Demand profiles;	MW Time	1 to 6 weeks	First Saturday of each month	DOC1
3.4	Demand profiles of the amount and duration of proposed use of Consumer Demand Management that may result in a Demand change of 1MW or more on a daily basis;	MW Time	1 to 6 weeks	First Saturday of each month	DOC1
3.5	Any change greater than 1 MW to the data submitted in 3.1. "No change" shall be reported if that is the situation;	MW Time	0 - 24 hours ahead	by 09:00 hours each day	DOC1
3.6	Active and Reactive Demand taken from the Distribution System for each hour;	MW Time	Previous day	10:00 hours	DOC1
3.7	Each application of Consumer Demand Management for the previous day that exceeded 1MW, the time, duration and Active Power Demand change;	MW Time	Previous day	10:00 hours	DOC1
4. Internally Interconnected Parties Connected to the Distribution Systems					
4.1	Total maximum and minimum transfers for each week and typical weekly profiles of daily peak transfers;	MW MVAr Time	1 to 3 years	End of November	DOC1
4.2	Total maximum and minimum transfers for each day and typical daily profiles of transfers at each Connection Point;	MW MVAr Time	1 to 6 weeks	First Saturday of each month	DOC1
4.3	Any change greater than 1 MW to the data submitted in 4.1. "No change" shall be reported if that is the situation;	MW MVAr Time	0 - 24 hours ahead	by 09:00 hours each day	DOC1

	Data Description	Units	Time period covered	Update time	Code category
4.4	Active and Reactive transfers to/from the Distribution System at each Connection Point for each hour;	MW MVAr Time	Previous day	10:00 hours	DOC1

Schedule D Operational Planning Years 0,1 and 2

All Distribution System Users Connected to the Distribution System shall provide the following data to the Licensed Distributor.

Distribution System User Name:.....

	Data Description	Units	Time period covered	Update time	Data category
1. Power Producers with Embedded CDGensets Connected to the Distribution System					
1.1	Submit to OETC data as required by Grid Code OC2. Copies of this data shall be submitted to the Licensed Distributor at the same time;	MW Date	Years 1 - 2	End of	DOC2
1.2	Submit to OETC data as required by Grid Code OC2. Copies of this data shall be submitted to the Licensed Distributor at the same time;	MW Date	1 to 6 weeks	10:00 hours First Saturday of each month	DOC2
1.3	All Distribution System Users shall notify the Licensed Distributor of any change greater than 1 MW to the data submitted in line 1.2. “No change” shall be reported if that is the situation;	MW Date	Following day	09:00 hours each day	DOC2
2. All Embedded Power Producers not subject to central Dispatch with total on-site Generation Capacity over 5 MW					
2.1	Submit to the Licensed Distributor maximum and minimum Availability and output for each Genset;	MW Time	Years 1 - 2	End of	DOC2
2.2	Submit to the Licensed Distributor	MW	1 to 6	10:00 hours	DOC2

	Data Description	Units	Time period covered	Update time	Data category
	maximum and minimum Availability and output for each Genset for each day;	Time	weeks	First Saturday of each month	
2.3	All Distribution System Users shall notify the Licensed Distributor of any change greater than 1 MW to the data submitted in line 2.2. "No change" shall be reported if that is the situation;	MW Date	Following day	09:00 hours each day	DOC2
3. All other Distribution System Users Connected to the Distribution System					
3.1	Details of proposed outages of its Distribution System User System which may affect the performance of the Distribution System;		Years 1 - 2	End of	DOC2
3.2	Details of trip testing and risks of the trip on apparatus Connected to the Distribution System;		Years 1 - 2	End of November	DOC2
3.3	All other information that may affect the reliability and stability of the Distribution System;		Years 1 - 2	End of November	DOC2
3.4	Update of data provided in 3.1, 3.2 and 3.3;		1 to 6 weeks	10:00 hours First Saturday of each month	DOC2
3.5	Update of data provided in 3.4. "No change" shall be reported if that is the situation;	MW Date	Following day	09:00 hours each day	DOC2
4. Licensed Distributor					
4.1	Prepare a coordinated schedule of Outages for Distribution HV apparatus and Plant including all major maintenance and construction outages. The schedule shall be made available to all Distribution System Users that may be affected by the Outages and any Distribution System User who requests a copy;		Years 1 - 2	End of August	DOC2

	Data Description	Units	Time period covered	Update time	Data category
4.2	Update of schedule of Outages for Distribution HV apparatus and Plant. The schedule shall be made available to all Distribution System Users that may be affected by the Outages and any Distribution System User who requests a copy;		1 to 6 weeks	10:00 hours First Saturday of each month	DOC2

Schedule E System Design Information

All Distribution System Users Connected to the Distribution System shall provide the following data to the Licensed Distributor. The Licensed Distributor shall also provide certain of the following data to Distribution System Users Connected to the Distribution System.

Distribution System User Name:.....

Data Description		**Units**	**Data category**
1. Reactive Compensation		MVAr	
1.1	Rating of individual shunt reactors (not directly associated with cables);	MVAr	DPC
1.2	Details of any automatic control logic such that operating characteristic can by determined;	Text/ Diagrams	DPC
1.3	Connection Point to the Distribution System;	Diagram	DPC
2. Lumped Network Susceptance			
2.1	Details of the equivalent lumped network susceptance of the Distribution System User System referred back to the Connection Point with the Distribution System; Including: shunt reactors which are an integrated part of a cable system and which are not normally in or out of service independent of the cable; Excluding: independently switched reactive compensation Connected to the Distribution System User System; and any susceptance inherent in the Active and Reactive Demand.	MVAr	DPC

Data Description		Units	Data category
3. Fault Infeeds			
3.1	Maximum and minimum short circuit infeeds into the Distribution System;	MVA	DPC
3.2	X/R ratio under maximum and minimum short circuit conditions (Contribution from rotating plant);		DPC
3.3	For Interconnected Systems, equivalent network information at the request of the Licensed Distributor;		DPC
4. For User interconnections that operate in parallel with the Distribution System, details of the interconnection impedance shall be exchanged between the Licensed Distributor and Distribution System User, including			
4.1	Positive Sequence Reactance;	% on 100 MVA	DPC
4.2	Positive Sequence Resistance;	% on 100 MVA	DPC
4.3	Zero Sequence Reactance;	% on 100 MVA	DPC
4.4	Zero Sequence Resistance;	% on 100 MVA	DPC
4.5	Susceptance;	% on 100 MVA	DPC
4.6	If in the view of the Licensed Distributor, the impedance is considered low then more detailed information will be requested;		DPC
5. Demand Transfer Capability			
5.1	Demand transfer capability data shall be exchanged where the same Demand may be supplied from alternative Connection Points including the proportion of Demand normally fed from each Connection Point;	Text/ Diagrams	DPC
5.2	The arrangements for manual/automatic transfer of Demand under planned/ Outage conditions shall be provided;	Text/ Diagrams	DPC
6. User System data			
6.1	The Licensed Distributor may request information on circuit parameters, switchgear and Protection arrangements;	Text/ Diagrams	DPC

Data Description		**Units**	**Data category**
7. OETC Transmission System Data			
7.1	The Licensed Distributor will request, as appropriate, information on circuit parameters, switchgear and Protection arrangements including protection settings;	Text/ Diagrams	DPC

Schedule F Load Characteristics

All Distribution System Users Connected to the Distribution System shall provide the following data to the Licensed Distributor, where applicable.

Distribution System User Name: .....

Note: Distribution System Users Connected at LV need only provide the data so indicated unless the Licensed Distributor requests additional data.

Data description		Units	Data category
1. Types of Demand:			
1.1	Maximum Active Power Demand;	kW	DCC
1.2	Maximum and minimum Reactive Power requirement;	kVAr	DCC
1.3	Type and electrical loading of apparatus and Plant to be Connected, e.g. number and size of motors, electrical cooling arrangements;	Text	DCC
1.3	Type of Load and control arrangements, eg variable speed motor type of starter employed;	Text	DCC
1.4	Maximum Load on each phase at the time of maximum Demand;	Amps/Phase	DCC
1.5	Maximum phase unbalance;	Amps/Phase at the time	DCC
1.6	Maximum harmonic content;	% of harmonic number	DCC
2. Fluctuating Loads:			
2.1	Rate of change of Active Power and Reactive Power both increasing and decreasing;	kW/sec kVAr/sec	DCC
2.2	Shortest repetitive time interval between fluctuation in Active Power and Reactive Power;	Sec	DCC
2.3	Largest step change in Active Power and Reactive Power both increasing and decreasing;	kW kVAr	DCC

Schedule G Metering Data

The Meter Registration System that is managed by OETC forms the Metering database and holds Metering data relating to Metering installations defined by the Metering and Data Exchange Code within the Grid Code.

Timing: All data shall be submitted promptly after Connection or any other event that causes a change to the data.

Abbreviations:

MO Meter Owner

PO Plant Owner

Plant Owners and Meter Owners are defined in the relevant Connection Agreements.

	Data	**Responsible Party**	**Data Category**
1	**Connection and Metering Point reference details for both Delivery Point and Actual Metering Point**		
1.1	Location and reference details;	PO	MDEC
1.2	Participant details at the Connection Point;	PO	MDEC
1.3	Site identification nomenclature;	PO	MDEC
1.4	Meter Owner;	PO	MDEC
1.5	Loss compensation calculation details where Actual Metering Point and Delivery Point differ;	PO	MDEC
2	**Main and Check Meter installation details**		
2.1	Meter serial numbers;	MO	MDEC
2.2	Metering installation identification name;	MO	MDEC
2.3	Meter types and models;	MO	MDEC
2.4	Instrument transformer serial numbers;	PO	MDEC
2.5	Instrument transformer ratios;	PO	MDEC
2.6	Test and calibration programme details: test results and reference test certificates for Meters and Measurement Transformers;	MO	MDEC
2.7	Asset management plan and testing schedule;	MO	MDEC

2.8	Calibration tables, where applied to achieve Meter installation accuracy;	MO	MDEC
2.9	Meter summation scheme values and multipliers;	MO	MDEC
2.10	Data register coding details;	PO MO	MDEC
3	**Data communication details (when communication systems are used):**		
3.1	Telephone number for access to data;	PO MO	MDEC
3.2	Communication equipment type and serial numbers;	MO	MDEC
3.3	Communication protocol details or references;	MO	MDEC
3.4	Data conversion details;	MO	MDEC
3.5	Distribution System User identifications and access rights;	MO	MDEC
4	**Data validation and substitution processes agreed between affected parties, including:**		
4.1	Algorithm;	MO	MDEC
4.2	Data comparison technique;	MO	MDEC
4.3	Processing and alarms (i.e. voltage source limits, phase-angle limits);	MO	MDEC
4.4	Check metering compensation details;	MO	MDEC
4.5	Alternate Metering data sources;	MO	MDEC

Distribution Connection Conditions Code (DCC)

Issued 5 Nov 2019

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Distribution Connection Conditions Code (DCC)

DCC.1 Introduction

The Distribution Connection Conditions Code (DCC) specifies the Connection requirements and the technical, design and operational standards and procedures for Distribution System Users and Licensed Distributors for planning and development of the Distribution System.

DCC.2 Objective

The objectives of this Distribution Connection Conditions Code are:

- to establish technical conditions for the Connection of Distribution System Users' Systems to a Licensed Distribution Systems;
- to provide sufficient information for a Distribution System User prior to and during the process of an application for Connection; and
- to provide sufficient information from Distribution System Users to enable the Distribution System, and the wider Total System to be properly managed in a safe, secure, efficient and economic manner.

DCC.3 Scope

In addition to Licensed Distributors, DCC applies to all Users of the Distribution Systems as follows;

- Embedded Power Producers with CDGensets;
- Embedded Power Producers with non CDGensets;
- Internally Interconnected Parties Connected to the Distribution System;
- International Interconnected Parties Connected to the Distribution System;
- OETC;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW while operating and maintaining a voltage network of ≥1000 V;
- Licensed Suppliers; and
- RAEC if Connected to the Distribution System.

DCC.4 Technical, design and operational criteria

The Distribution System and any Distribution System User Connections to the Distribution System shall be designed to be consistent with the security requirements of Condition 31 of the Distribution and Supply Licence.

Licensed Distributors shall ensure that the Distribution System complies with the following technical, design and operational criteria in relation to the part of the Distribution System at the Connection Site with a Distribution System User.

DCC.4.1 Voltage regulation

The voltage on the 66kV, 33kV and 11kV sides of Distribution transformers at Connection Sites with Distribution System Users shall normally be controlled within the limits +/-6.0% of the nominal value.

During some System Disturbances such as where short circuits occur, the voltage may collapse transiently to zero at the point of fault until the fault is cleared.

Under fault and circuit switching conditions the 50.00Hz Frequency component of voltage may fall or rise transiently. The fall or rise in voltage will be affected by the method of Earthing of the neutral point of the Distribution System and this variation in voltage shall be taken into account in selecting apparatus and Plant from an appropriate specification for installation on or Connection to the System.

The voltage at the Consumer's terminals shall not vary from the System nominal voltage by more than;[1]

Consumers Connected at	Nominal voltage	Tolerance
HV	33/11kV	+6.0% to –6.0%
LV	415/240 V	+6.0% to –6.0%

DCC.4.2 Frequency deviations

During normal operating conditions, the nominal System Frequency of the Transmission and Distribution Systems will be 50.00 Hz and normally will be controlled by OETC between 49.95Hz and 50.05Hz. During exceptional steady state conditions, Frequency deviations will not exceed 49.90Hz to 50.10Hz unless disturbed circumstances prevail.

Under disturbed conditions, System Frequency could rise transiently to 51.50 Hz or fall to 48.00 Hz.

DCC.4.3 Voltage waveform quality

All apparatus and Plant Connected to the Distribution System, and that part of the Distribution System at each Connection Point, should be capable of withstanding the following distortions of the voltage waveform in respect of harmonic content and phase unbalance.

The maximum total levels of harmonic distortion on the Distribution System at 66kV, 33kV and 11kV, from all sources under both normal, planned outage and fault outage conditions, shall not exceed a total harmonic distortion of 2.0% with no individual harmonic greater than 1.5% unless abnormal conditions prevail. At LV the maximum total levels of harmonic distortion from all sources shall not exceed a total harmonic distortion of 2.5%

The maximum negative phase sequence component of the phase voltage on the Distribution System should remain below 1.0% unless abnormal conditions prevail.

A maximum value of 2.0% is permitted for phase unbalance.

[1] In accordance with OES4, May 1989

DCC.4.4 Voltage fluctuations

Voltage fluctuations arising from fluctuating Demands Connected at a Connection Point to the Distribution System shall not exceed 1.0% of the voltage level for step changes that may occur repetitively. Any large voltage excursions other than step changes may be allowed up to a level of 3.0% provided that this does not constitute a risk to the Distribution System or to any Distribution System User.

DCC.4.5 Auto-reclosing and single phase Protection Operation

Distribution System Users should be aware that Licensed Distributors may use auto-reclosing or sequential switching features on the Distribution System. Licensed Distributors will on request provide details of the auto-reclosing or sequential switching features in order that the Distribution System User may take this into account in the design of the Distribution System User System, including Protection arrangements.

Distribution System Users should be aware that the Protection arrangements on some Distribution Systems may cause disconnection of one phase or two phases only of a three phase Supply for certain types of fault.

DCC.5 Technical standards applying to Distribution System Users

All Distribution System User apparatus and Plant associated with the Connection to the Distribution System shall comply with the following standards, as applicable (in the following order of precedence):

(a) Safety Rules;

(b) Oman Electrical Standards, which are such national standards as may be approved by and amended by the Grid Code Review Panel from time to time or which are imposed under the Sector Law;

(c) the standards and recommendations of the International Standards Organisation and the International Electrotechnical Commission; and

(d) national standards and codes which are accepted internationally.

Further advice will be made available upon request to a Licensed Distributor**.**

In the event that any standard or specification with which a Distribution System User's Plant and/or apparatus is required to comply under DCC.5 is amended, the Licensed Distributor, having consulted with the affected Distribution System Users, will bring the issues to the Distribution Code Review Panel for consideration. Following the review, the Distribution Code Review Panel will make a recommendation as to what action, if any, should be taken regarding compliance to the Regulatory Authority for approval.

Where a Licensed Distributor determines that in order to ensure safe and co-ordinated Operation of a Distribution System User's Plant and/or apparatus with the Distribution System, there is a requirement for supplemental specifications and/or standards to apply to the design of a Distribution System User's Plant and/or apparatus, the Licensed Distributor shall notify the Distribution System User and the Distribution System User shall comply with the additional requirements. On request from the Distribution System User, a Licensed Distributor shall provide reasonable evidence as necessary to demonstrate the need for the supplemental specifications and/or standards. If a Distribution System User is still not

satisfied, the Distribution System User may refer the issue to the Distribution Code Review Panel for review.

DCC.5.1 Specific design and performance standards

DCC.5.1.1 Specification of apparatus and Plant,

The specifications of apparatus and Plant shall be such as to permit Operation of the Distribution System within the Safety procedures of the Licensed Distributor, details of which will be made available by the Licensed Distributor upon request.

Apparatus and Plant shall be suitable for use at the operating Frequency, within the intended operating voltage range and at the design short-circuit rating of the Distribution System to which it is Connected having due regard to fault carrying capabilities and making and breaking duties. In appropriate circumstances, a Licensed Distributor will provide details of the System to which Connection is to be made.

Apparatus and Plant shall be Operated within the thermal rating conditions contained in the appropriate standards, specifications, and other relevant publications, taking into account the intended use. Upon request, a Licensed Distributor will make such information available.

DCC.5.1.2 Earthing

Licensed Distributors shall advise on the method of Earthing of the Distribution System, for example, whether it is Connected solidly to Earth or through an impedance. The specification of associated apparatus and Plant of the Distribution System User shall meet the voltages that will be imposed on the apparatus and Plant as a result of the method of Earthing. The methods of Earthing should comply with the requirements of Oman Electrical Standards.

Distribution System Users shall take precautions to limit the occurrence and effects of circulating currents in respect of the neutral points Connected with Earth where there is more than one source of electricity.

DCC.5.1.3 Voltage regulation and control

Any extension or Connection to the Distribution System shall be designed in such a way that it does not adversely affect the voltage control employed by a Licensed Distributor on the Distribution System. The Licensed Distributor if requested by the Distribution System User, will make information on the voltage regulation and control arrangements available.

DCC.5.1.4 Protection

The Distribution System and the System of any Distribution System User Connected to the Distribution System shall incorporate protective devices to ensure that apparatus and Plant with electrical faults are disconnected from the System promptly and that the effects of faults on one System do not impose unreasonable risks to other Systems.

To ensure satisfactory Operation of the Distribution System, Protection Systems, operating times, discrimination, and sensitivity at the ownership boundary shall be agreed between the Licensed Distributor and the Distribution System User during the process of application for Connection and may be reviewed from time to time by the Licensed Distributor with the agreement of the Distribution System User.

Back-up Protection by Operation of other circuit breakers or apparatus and Plant having a similar function must normally be provided, to safeguard the System against a circuit breaker, or apparatus and Plant having a similar function, failing to Operate correctly to interrupt fault current on a High Voltage System. During the process of application for Connection, the Licensed Distributor will advise the Distribution System User if Back-up Protection is not required.

Distribution System Users shall not use Protection and associated apparatus and Plant to limit the fault current infeed to the Distribution System, if the failure of that Protection and associated apparatus and Plant to Operate as intended in the event of a fault, could cause apparatus and Plant owned by the Licensed Distributor to Operate outside its short-circuit rating, unless the Licensed Distributor should advise otherwise.

DCC.5.1.5 Superimposed signals

Where Distribution System Users install mains-borne signalling apparatus and Plant it shall comply with European Standard EN50065 as amended from time to time. Prior agreement shall be obtained in writing from the Licensed Distributor where a Distribution System User proposes to use such apparatus and Plant that may superimpose signals on the Distribution System.

DCC.6 General requirements for Connection

DCC.6.1 Introduction

DCC.6 ensures that all Distribution System Users of the Distribution System are subject to the same requirements for Connection. DCC.6 specifies the information required from Distribution System Users by Licensed Distributors in order to ensure that adequate technical provision is made for new Supplies or increases in existing Demand. DCC.6 also applies to Gensets that Operate in parallel with the Distribution System, where a Supply is required from a Licensed Distributor under normal or Emergency Conditions.

DCC.6.2 Declaration of Demand characteristics

DCC.6.2.1 Supplies at Low Voltage

For Supplies at Low Voltage it is possible in most cases to assess whether a proposed Connection is acceptable, and to determine the necessary Supply arrangements, from analysis of the following limited data:

(i) maximum power requirements (kVA or kW and Power Factor);

(ii) type and electrical loading of apparatus and Plant to be Connected, e.g. number and size of motors, electrical cooling arrangements; and

(iii) the date when the Connection is required.

These data requirements will be specified on the appropriate application for Connection form obtainable from Licensed Distributors. Should a preliminary examination of this data indicate that more detailed information is required then it shall be provided to the Licensed Distributor upon request if reasonably required.

DCC.6.2.2 Supplies other than at Low Voltage

For Supplies other than at Low Voltage it may be necessary for the following additional information to be provided on request:

(i) All types of Demand:

(a) maximum Distribution System User Active Power requirement (MW);

(b) maximum and minimum Reactive Power requirements (Mvar);

(c) type of Demand and control arrangements eg controlled rectifier or large motor drives, type of starter employed;

(d) maximum Demand on each phase at time of maximum Demand; and

(e) the maximum harmonic currents to be imposed on the Licensed Distributor Distribution System.

(ii) Fluctuating Demands:

Details of the cyclic variation, and where applicable the duty cycle, of Active Power (and Reactive Power, if appropriate), in particular:

(a) the rates of change of Active and Reactive Power, both increasing and decreasing;

(b) the shortest repetitive time interval between fluctuations in Active Power and Reactive Power; and

(c) the magnitude of the largest step changes in Active Power and Reactive Power, both increasing and decreasing.

In some cases, more detailed information may need to be provided to permit a full assessment of the effect of the Demand on the Distribution System. Such information may include an indication of the pattern of build up of Demand and a proposed commissioning programme. Licensed Distributors will specifically request this information when necessary.

DCC.6.3 Connection arrangements

The design of Connections between the Distribution System and Distribution System Users shall be in accordance with the principles set out in the DCC, subject to any modification to which the Licensed Distributor may reasonably consent.

During the process of application for Connection a Licensed Distributor will agree with the Distribution System User the voltage level to which a Distribution System User will be Connected in accordance with its normal practice for the type of Demand to be supplied. The Licensed Distributor may on occasion specify a different Connection voltage from normal in order to avoid potential disturbance caused by the Distribution System User apparatus to other Distribution System Users of the Distribution System or for other technical reasons or may agree alternative methods for minimizing the effects of disturbing Demands.

Before entering into a ECA/ECUOSA it will be necessary for a Licensed Distributor to be reasonably satisfied that the Distribution System User's System at the boundary with the Distribution System will comply with all appropriate requirements of the Distribution Code.

DCC.6.4 Electrical Delivery Points

The point or points at which Supply is given or taken will be the Electrical Delivery Points as specified in the ECA/ECUOSA. For Supplies at Low Voltage the general rule is that the Electrical Delivery Point will be at the Distribution System User terminals of the Metering System.

For High Voltage Supplies, including Connections between Licensed Distributor and Distribution System Users, and where necessary, busbar Connected Supplies at Low Voltage, the points of Supply will be the Electrical Delivery Points as specified in the ECA/ECUOSA. The respective ownership of Plant or apparatus will be recorded in the ECA/ECUOSA between a Licensed Distributor and the Distribution System User as required. In the absence of a separate agreement between the parties to the contrary, construction, commissioning, control Operation and maintenance responsibilities follow ownership.

Paragraph DCC.9 specifies responsibilities at the Connection Site.

DCC.6.5 Communications

Where, for operational reasons, a Licensed Distributor determines that a means of routine and emergency communication between the Licensed Distributor and the Distribution System User is required then the same shall be provided and maintained by the Distribution System User.

DCC.7 Technical requirements for Connections

DCC.7.1 Introduction

DCC.7 specifies the technical arrangements required at the ownership boundary between the Distribution System and the System of the Distribution System User and is applicable at all voltage levels.

DCC.7.2 Apparatus and Plant at the ownership boundary

All apparatus and Plant at the ownership boundary shall meet the design principles contained within DCC.4. Connections for entry to and exit from the Distribution System shall incorporate a means of disconnection of the installation by the Licensed Distributor**.**

DCC.7.3 Protection requirements

Protection requirements vary widely depending on established practices and the needs of the particular Distribution System. The basic requirement in all cases is that Distribution System User arrangements for Protection at the ownership boundary, including types of apparatus and Plant and Protection settings, must be compatible with standard practices on the Distribution System, as specified by the Licensed Distributor during the process of application for Connection. In particular;

(i) maximum clearance times (from fault current inception to arc extinction) must be within the limits established by the Licensed Distributor in accordance with Protection and apparatus and Plant short circuit rating policy adopted for the Distribution System;

(ii) in Connecting to the Distribution System the Distribution System User should be aware that auto-reclosing or sequential switching features may be in use on the Distribution System. A Licensed Distributor will on request provide details of the auto-reclosing or sequential switching features in order that the Distribution System User may take this into account in the design of the Distribution System User System, including Protection arrangements; and

(iii) the Distribution System User should also be aware that the Protection arrangements on some Distribution Systems, e.g. rural, may cause disconnection of one phase only of a three phase Supply for certain types of fault.

DCC.7.4 Earthing

Earthing of that part of the Distribution System User System that is Connected to a Licensed Distributor's Distribution System shall comply with the arrangements specified in DCC.5.2.1.

DCC.7.5 Fault level considerations

The short circuit rating of Distribution System User's apparatus and Plant at the Connection Point should be not less than the design fault level of the Distribution System to which it is Connected. The choice of apparatus and Plant for Connection at Low Voltage may take into account attenuation in the service lines in accordance with Good industry Practice. A Licensed Distributor in the design of its System will take into account the contribution to fault level of the Connected System and apparatus.

In order to permit these assessments to be carried out information should be exchanged on prospective fault power infeed and X/R ratios, where appropriate, at points of entry to and exit from the Distribution System.

DCC.7.6 Capacitive and inductive effects

The Distribution System User shall, when applying to make a Connection, provide the Licensed Distributor with information as detailed in DCC.7. Details will be required of capacitor banks and reactors Connected at High Voltage which could affect the Distribution System and which it is proposed to Connect if agreed by the Licensed Distributor. When requested by the Licensed Distributor details of distributed circuit capacitance and inductance shall also be provided. Sufficient detail is required to:

(i) verify that controlling apparatus and Plant of the Distribution System is suitably rated;

(ii) show that the performance of the Distribution System will not be impaired; and

(iii) ensure that arc suppression coils when used by a Licensed Distributor for System Earthing purposes are correctly installed and Operated.

DCC.7.7 Telemetry

The Distribution System User should provide such voltage, current, Frequency, Active Power and Reactive Power pulses and outputs and status points from its System as are considered reasonable by Licensed Distributors to ensure adequate System monitoring. The telemetry outstation in such a situation will be provided, installed and maintained by the Licensed

Distributor. Under the requirements of the Grid Code new CDGensets and Production Facilities will need to provide signals to OETC for monitoring purposes.

If it is agreed between the parties that a Licensed Distributor shall control the switchgear on the Distribution System User's System the Licensed Distributor shall install the necessary telecontrol outstation.

Notwithstanding the above, it shall be the responsibility of the Distribution System User to provide the necessary control interface for the Distribution System User switchgear that is to be controlled.

DCC.8 Requirements For Embedded Gensets

DCC.8.1 Introduction

DCC.8 is applicable to all existing or prospective Power Producers, including Embedded CDGensets, non-CDGensets and Consumers with own Gensets having Plant operating or capable of operating in parallel with the Distribution System.

Power Producers whose existing Gensets do not comply at present with all of the requirements of this section shall inform the Licensed Distributor and in such cases the Licensed Distributor will advise the Power Producer which requirements are necessary for the Operation of the Distribution System. The Distribution System User shall seek a derogation from the Regulatory Authority for each and every required dispensation.

In addition to meeting the requirements of DCC.8, Embedded Gensets shall meet the requirements of other relevant sections of the Distribution Code.

DCC.8.2 General requirements

Embedded CDGensets shall comply with the general principles of the Grid Code, subject to the particular requirements of the Licensed Distributor necessitated by the adjacent Distribution System conditions, which will be made known by the Licensed Distributor during the Connection application process. Copies of data supplied in accordance with the Grid Code shall be given to the Licensed Distributor.

DCC.8.3 Provision of information

Embedded Gensets will fall within three basic classes for which the Power Producer shall provide the following minimum information to a Licensed Distributor during the process of Connection application or otherwise as requested by the Licensed Distributor. When applying for Connection to the Distribution System Power Producers shall also refer to DCC.5 and OES. The three basic classes are;

- Embedded CDGensets (All Gensets with a Registered Capacity of 5MW or greater will be centrally dispatched);
- Embedded Gensets Connected at or below 20 kV and with an output not in excess of 5MW; and
- Embedded Gensets who are to be Connected at Low Voltage and less than 300 kVA in capacity.

The Licensed Distributor will use the information provided to model the Distribution System and to decide what method of Connection will need to be employed and the voltage level at which the Connection should be made. If the Licensed Distributor reasonably concludes that the nature of the proposed Connection or changes to an existing Connection requires more detailed consideration then further information may be requested. It is unlikely that more information than that specified in DCC.8.3.1 will be required for Embedded Gensets who are to be Connected at Low Voltage and are less than 50 kVA in capacity, or Connected at other than Low Voltage and less than 300 kVA in capacity.

DCC.8.3.1 Information required from all Embedded Gensets

Each Power Producer will provide to the Licensed Distributor information on (a) the Gensets and (b) the proposed interface arrangements between the Genset and the Distribution System. The Licensed Distributor may require the following information before entering into an ECA/ECUOSA to Connect any Gensets to the Distribution System:

Genset data		
a	Terminal volts;	kV
b	Rated Capacity;	KVA
c	Rated Capacity;	kW
d	Maximum Active Power sent out	Kwso max
	Reactive Power requirements (if any);	Kvar
e	Type of Genset;	Synchronous, asynchronous, etc
f	Type of prime-mover;	
g	Anticipated operating regime of Gensets;	Continuous, intermittent, peak lopping
h	Fault level contribution;	KA
I	Method of voltage control;	
j	Generator transformer details;	As applicable
k	Requirements for top-up Supplies and/or standby Supplies;	

Interface arrangements

a The means of Synchronisation between the Licensed Distributor and Distribution System User;

b Details of arrangements for Connecting with earth that part of the User System Connected to the Distribution System;

c The means of Connection and disconnection which are to be employed;

d Precautions to be taken to ensure the continuance of safe conditions should any earthed neutral point of the User System Operated at HV become disconnected from earth;

DCC.8.3.2 Additional information required from some Embedded Gensets

A Licensed Distributor may request the information set out in Appendix A before entering into a ECA/ECUOSA to Connect any Gensets greater in size than 5 MW or Connected at a voltage level above 11 kV onto the Distribution System:

DCC.8.4 Technical requirements

DCC.8.4.1 Genset performance requirements

For Embedded CDGensets the electrical parameters required would be those detailed in the Grid Code.

For Gensets not subject to Central Dispatch the electrical parameters that must be achieved at the Genset terminals are defined according to the Connection method and will be specified by the Licensed Distributor with the offer for Connection. Each Genset or Production Facility must be capable of Supplying its Registered Capacity within the Total System Frequency range 49.50 to 50.50 Hz. The output power should not be affected by voltage changes within the permitted operating range.

DCC.8.4.2 Control arrangements

Licensed Distributors will specify in writing if a continuously acting fast response automatic excitation control System is required to control the Genset voltage without instability over the entire operating range of the Genset or Production Facility. This will be dependent on the size and type of Genset or Production Facility and the part of the Distribution System to which it is Connected.

DCC.8.4.3 Coordinating with existing protection

It will be necessary for the Protection associated with Embedded Gensets to co-ordinate with the Protection associated with the Distribution System as follows:

(i) For Gensets Connected to the Distribution System the Genset must meet the target clearance times for fault current interchange with the Distribution System in order to reduce to a minimum the impact on the Distribution System of faults on circuits owned by Power Producers. A Licensed Distributor will ensure that the Licensed Distributor Protection settings meet its own target clearance times.

The target clearance times are measured from fault current inception to arc extinction and will be specified by the Licensed Distributor to meet the requirements of the relevant part of the Distribution System.

(ii) The settings of any Protection controlling a circuit breaker or the operating values of any automatic switching device at any Connection Point with the Distribution System shall be agreed between the Licensed Distributor and the Distribution System User in writing during the Connection consultation process.

The Protection settings or operating values shall not be changed without the written agreement of the Licensed Distributor.

(iii) It will be necessary for the Genset Protection to co-ordinate with any auto-reclose policy specified by the Licensed Distributor.

(iv) Any Genset or Production Facility Connected to the Distribution System will be required to withstand, without tripping, the negative phase sequence loading incurred during the clearance of a close-up phase-to-phase fault by System Backup Protection which will be within the Plant short time rating on the Distribution System. The Licensed Distributor will advise the Power Producer of the expected negative phase sequence loadings during the ECA/ECUOSA process.

DCC.8.4.4 Islanding

It is possible that a part of a Distribution System to which Embedded Gensets are Connected could, during Emergency Conditions, become detached from the rest of the Distribution System. A Licensed Distributor shall decide dependent on local network conditions, if it is desirable for the Embedded Gensets to continue to Generate onto the islanded Distribution System.

If no facilities exist for the subsequent resynchronisation of the islanded section of the Distribution System with the rest of the Distribution System then the Embedded Genset will under Licensed Distributor instruction, ensure that the Genset is disconnected for resynchronisation.

Under Emergency Conditions there is an expectation that some Gensets will continue to Operate outside the Frequency limits set down in the Grid Code CC.6. However, for Embedded Gensets Connected to the Distribution System at a voltage level less than 33 kV it is likely that this could mean Connection within an automatic under-frequency Demand disconnection zone. Consequently, Embedded Gensets should ensure that all Protection on Gensets should have settings to co-ordinate with those on the automatic under-frequency Demand disconnection apparatus and Plant that will be detailed by the Licensed Distributor on request.

DCC.8.4.5 Black Start capability

Each Embedded Power Producer shall notify the Licensed Distributor if its Gensets has a restart capability without Connection to an external power Supply, unless the Embedded Genset shall have previously notified OETC accordingly under the Grid Code.

DCC.8.4.6 Genset commissioning tests

Where Gensets require Connection to the Distribution System in advance of the commissioning date, for the purposes of testing, the Genset must comply with the requirements of the ECA/ECUOSA. The Power Producer shall prepare a commissioning programme and obtain approval to the programme from the Licensed Distributor to allow commissioning to be coordinated.

DCC.9 Site responsibilities and boundaries

DCC.9 contains principles for the responsibilities that will normally apply at shared sites for

- safety,
- site access,
- site common drawings,
- maintenance, and
- site operational procedures

ECA/ECUOSAs will specify the arrangements to apply at specific sites in detail and will prevail over those specified in this paragraph DCC.9 if there is any inconsistency. The scope of specific Connection Site schedules will be determined by the size and complexity of the apparatus and Plant at the Connection Site. Licensed Distributors shall determine the requirements of the schedules.

The responsibilities for construction, commissioning, control, Operation and maintenance will follow ownership unless there is other agreement between the parties.

DCC.9.1 Distribution System User Connection Site Schedules

A set of Connection Site schedules shall be prepared identifying the apparatus, Plant and other equipment at the Connection Site. The Connection Points, ownership of all equipment and the responsibilities for safety, control and maintenance and all relevant boundaries will be clearly delineated.

The responsibilities for safety, control and maintenance shall be included in a Site Responsibility Schedule to inform site operational staff and the Licensed Distributor engineers of agreed responsibilities for Plant and/or apparatus at the operational interface.

Appendix B sets down the requirements for Connection Site schedules. The attachment to Appendix B provides a format to be used in the preparation of Site Responsibility Schedules. The Connection Site schedules and the Site Responsibility Schedules shall form part of the relevant ECA/ECUOSA.

DCC.9.2 Responsibilities for Safety

Any Distribution System User entering and working on its Plant and/or apparatus on a Licensed Distributor site will work to the “MEW Safety Rules (Electrical and Mechanical) Second Edition issued 1989 and amended in 1995” and any amendments to these safety rules, unless otherwise agreed in writing.

A Licensed Distributor entering and working on its Plant and/or apparatus on a Distribution System User Site will work to the Distribution System User’s Safety Rules, unless otherwise

agreed in writing. Until receipt of such notice, the “MEW Safety Rules (Electrical and Mechanical) Second Edition, issued 1989 and amended in 1995” will apply.

Licensed Distributors and/or Distribution System Users shall notify each other of any Safety Rules that apply to the other’s staff working at its Connection Sites.

DCC.9.3 Site Common Drawings

Site Common Drawings shall be prepared for each Connection Site and shall include Connection Site layout drawings and electrical layout drawings. They will identify the responsibilities for common services drawings. These items will form part of the ECA/ECUOSA that will also require common Protection/control drawings to be available to all relevant parties,

DCC.9.4 Operational diagrams

Upon signing the ECA/ECUOSA and prior to energisation, all HV Consumers and Embedded Power Producers Connected to the Distribution System shall submit Operation Diagrams to the Licensed Distributor.

An Operation Diagram shall be prepared for each Connection Site at which a Connection Point exists using, where appropriate, the graphical symbols shown in Appendix C. The Operation Diagram shall be prepared for each Connection Site at which a Connection Point exists and shall

- include all HV apparatus and the Connections to all external circuits;
- incorporate numbering, nomenclature and labelling, as set out in the DOC 7; and
- show the agreed ownership boundary and maintenance responsibilities of apparatus and Plant on its Distribution System User System.

The Licensed Distributor will add the necessary information about its apparatus and Plant on the Distribution System. The Licensed Distributor and Distribution System User will each retain copies of these documents.

When a Licensed Distributor or a Distribution System User has determined that it wishes to install new HV apparatus or it wishes to change the existing numbering or nomenclature of a Connection Site, the Licensed Distributor or Distribution System User shall two months prior to the installation or change, send to the other party a revised Operation Diagram of that Connection Site, incorporating the new Licensed Distributor HV apparatus to be installed and its numbering and nomenclature or the changes, as the case may be.

Changes in boundary arrangements proposed by either party must be agreed in advance and shall be recorded on the revised copies of Operational Diagrams and in a revision to the relevant ECA/ECUOSA(s).

DCC.9.5 Maintenance standards

It is a requirement that all Distribution System User apparatus and Plant on Licensed Distributor Sites are maintained adequately for the purpose for which they are intended and to ensure that they do not pose a threat to the safety of any of Licensed Distributor Plant, apparatus or Persons on the Licensed Distributor Site.

A Licensed Distributor shall have the right to inspect the test results and maintenance records relating to such apparatus and Plant at any time.

It is a requirement that all Licensed Distributor apparatus and Plant on Distribution System User Sites is maintained adequately for the purposes for which it is intended and to ensure that it does not pose a threat to the safety of any of the Distribution System User Plant, apparatus or Persons on the Distribution System User Site. Distribution System Users shall have the right to inspect the test results and maintenance records relating to such apparatus and Plant, at any time.

DCC.9.6 Site operational procedures

Licensed Distributors and Distribution System Users with an interface with a Licensed Distributor must make available staff to take necessary Safety Precautions and carry out operational duties as may be required to enable work/testing to be carried out and for the Operation of apparatus and Plant Connected to the Distribution System.

Appendix A Embedded Gensets Connected at a voltage above 11 kV

Information required from Embedded Gensets greater in size than 5 MW or Connected at a voltage level above 11 kV

(i) Technical data

a. Genset information (impedances p.u. on rating):

Type of prime mover;

Rated Capacity MVA;

Rated Sent out Capacity Mwso;

Genset MW/MVAr Performance Chart (at Genset voltage terminals);

Type of excitation system;

Inertia constant MW sec/MVA (whole machine);

Stator resistance;

Direct axis reactances;	Sub-transient	
	Transient	
	Synchronous	
Quadrature axis reactances	Sub-transient	
	Synchronous	
Time constants	Direct axis	Sub-transient
		Transient
Quadrature axis: (Stating either open or short circuit time constant)	Sub-transient	
Zero sequence	Resistance	
	Reactance	
Negative sequence	Resistance	
	Reactance	
Generator transformer: resistance;	Reactance	
	MVA rating	
	Tap arrangement	
	Vector group	
	Earthing	

b. Automatic Voltage Regulator

A block diagram for the model of the AVR System including the data on the gains, forward and feedback gains, time constants and voltage control limits;

c. Speed governor & prime mover data

A block diagram of the Genset turbine control system and turbine time constants together with the turbine rating and maximum power;

(ii). Capacity and standby requirements

a. Registered Capacity and Minimum Generation of each CDGenset and Production Facility in MW;

b. CDGenset and Production Facility auxiliary Demand (Active Power and Reactive Power) in MW and MVAr, at Registered Capacity conditions. Consumers with own Gensets should include top-up requirements;

c. CDGenset and Production Facility auxiliary Demand (Active Power and Reactive Power) in MW and MVAr, under Minimum Generation conditions. Consumers with own Gensets should include top-up and standby requirements;

Appendix B The Preparation of Site Responsibility Schedules

Principles and basic procedure to be used in the preparation of Connection Site schedules. The scope of specific Connection Site schedules will be determined by the size and complexity of the apparatus and Plant at the Connection Site. Licensed Distributors shall determine the requirements of the schedules.

B.1 Principles

At all HV Complexes the following Connection Site schedules shall be drawn up in accordance with the Site ECA/ECUOSAs or with such variations as may be agreed between a Licensed Distributor and Distribution System Users.

(a) Connection Site details and equipment, including;

- i) Connection Site location;
- ii) Ownership of assets and demarcation and delineation of all relevant boundaries;
- iii) Connection Points;
- iv) Site Responsibility Schedule and demarcation and delineation of all relevant boundaries;
- v) Operational Diagram.

(b) Site capacity and tariff Metering including Electrical Delivery Points;[2]

(c) Site services;

(d) Site specific technical conditions, including;

- vi) Special technical facilities;
- vii) Protection requirements;
- viii) Operational Metering;
- ix) Control telephony;
- x) Special equipment requirements;
- xi) System monitoring inputs;
- xii) Other site services

Each set of Connection Site schedules for a Connection Site shall be prepared by the Licensed Distributor in consultation with other Distribution System Users at least 2 weeks prior to the Completion Date under the ECA/ECUOSA for that Connection Site (which may form part of a Complex). Each Distribution System User shall, in accordance with the timing requirements of the ECA/ECUOSA, provide information to the Licensed Distributor to enable it to prepare the Site Responsibility Schedule.

Each set of Connection Site schedules shall be subdivided to take account of any separate Connection Sites on that Complex.

[2] The Metering requirements are given in the Grid Code – Metering Systems and Data Exchange Code.

Each Site Responsibility Schedule, (a) (iv) above, shall detail for each item of apparatus and Plant;

1. Plant/apparatus ownership;
2. Safety (applicable Safety Rules and control Person or other responsible person (Safety Coordinator), or such other person who is responsible for safety);
3. Operations (applicable operational procedures and control engineer);
4. Site manager (controller);
5. Responsibility to undertake maintenance; and
6. Responsibility for site security.

The Site Responsibility Schedule shall be prepared in accordance with the attachment to this Appendix unless otherwise agreed in writing with the Licensed Distributor and shall include, for each Connection Site, lines and cables emanating from the Connection Site.

Every page of each Connection Site schedule shall bear the date of issue and the issue number.

Following preparation of a set of Connection Site schedules, the Licensed Distributor shall send it to the Distribution System Users involved for confirmation of its accuracy.

The Connection Site schedules shall be signed on behalf of the Licensed Distributor by the representative responsible for the area in which the Complex is situated and on behalf of each Distribution System User involved by its responsible manager, by way of written confirmation of its accuracy. Once signed, the Licensed Distributor shall distribute two copies, not less than two weeks prior to its implementation date, to each Distribution System User which is a party on the Connection Site schedule, accompanied by a note indicating the issue number and the date of implementation.

B.2 Alterations to existing Site Responsibility Schedules

When a Distribution System User identified on a Connection Site schedule becomes aware that an alteration is necessary, it must inform the Licensed Distributor immediately and in any event 8 weeks prior to any change taking effect.

Where a Distribution System User has informed the Licensed Distributor of a change, or the Licensed Distributor proposes a change, the Licensed Distributor shall prepare a revised Connection Site schedule and ECA/ECUOSA modification not less than 6 weeks prior to the change taking effect.

The revised Connection Site schedule shall be signed and accompanied by a note indicating where the alteration(s) has/have been made, the new issue number and the date of implementation.

When a Distribution System User identified on a Connection Site schedule, or a Licensed Distributor, as the case may be, becomes aware that an alteration to the Connection Site schedule is required urgently to reflect an emergency situation for example, the Distribution System User shall notify the Licensed Distributor, or the Licensed Distributor shall notify the Distribution System User, as the case may be, immediately and shall discuss:

1. what changes are necessary to the Connection Site schedules;
2. whether the Connection Site schedules are to be modified temporarily or permanently;

3. the distribution of the revised Connection Site schedules.

The Licensed Distributor shall prepare the revised Connection Site schedules and ECA/ECUOSA modification as soon as possible, and in any event within 7 days of it being informed of or knowing the necessary required alteration. The Connection Site schedules shall be confirmed by Distribution System Users and signed on behalf of the Licensed Distributor and Distribution System Users as soon as possible after it has been prepared and sent to Distribution System Users for confirmation and the ECA/ECUOSA modification will be duly executed.

B.3 Responsible managers

Each Distribution System User shall, prior to the Completion Date under each ECA/ECUOSA, Supply to the Licensed Distributor a list of managers who have been duly authorised to sign Connection Site schedules on behalf of the Distribution System User and the Licensed Distributor shall, prior to the Completion Date under each ECA/ECUOSA, Supply to that Distribution System User the name of the manager responsible for the area in which the Complex is situated.

Issued April, 2020

Attachment to Appendix B

Proforma for Site Responsibility Schedule

Licensed Distributor:……..

Connection Site:. ……

Company: ……

Item of equipment	Equipment owner	Safety Rules[3]	Safety co-ordinator[4]	Operational procedures	Control responsibility	Party Responsible for Statutory Inspections, Maintenance and Fault Investigations	Security Responsibility	Access[5] [6]	Comments

Signed on behalf of the Licensed Distributor **Date**

Signed on behalf of each Distribution System User involved

by way of written confirmation of its accuracy

[3] MHEW Safety Rules were formerly referred to as the MEW Safety Rules, as changed from time to time in accordance with the Grid Code.

[4] At all interfaces the Licensed Distributor and the User must co-ordinate activities but the System User authorized Person has overall responsibility.

[5] Access applies to authorised subcontractors of the Licensed Distributor and the User also.

[6] Access to the Licensed Distributor compound is with the Licensed Distributor's approval, exercised by the site security officer.

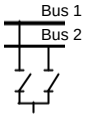
Appendix C Symbols for Operation Diagrams


Circuit Breaker


Circuit Breaker


Isolator


Earth Switch



Double Busbar with Selection


2 Winding Transformer


Earthing Resistance


Surge Arrester


Capacitor


A. C. Generator

Motor


Fuse

Automatic Reclose Switch


Cable


Overhead Line


Current Transformer

Voltage Transformer

Distribution Planning Code (DPC)

Issued 5 Nov 2019

CONTENTS

Distribution Planning Code (DPC)

DPC.1 Introduction

Distribution Planning Code (DPC) sets out the roles and responsibilities of Licensed Distributors and Distribution System Users regarding the data to be exchanged and the procedures to be followed between parties for the development of the Distribution Systems.

The Distribution System Users' requirements may necessitate the reinforcement of or extension to the Distribution System and in some instances may require reinforcement of a Connection Point.

The timescales required for the planning and development of the Distribution System depend on;

- the type and extent of the necessary reinforcement and or extension work;
- the need to obtain land rights or other consents;
- the need to maintain security of Supply to other Distribution System Users whilst work is undertaken; and
- the need to keep to a minimum, any Supply interruptions needed to carry out the work.

Operational Planning to coordinate Outages of and Plant is covered in the Operating Code DOC2, Operational Planning.

DPC.2 Objectives

The objectives of DPC are to provide for the roles and responsibilities of the Licensed Distributors and Distribution System Users to enable;

- the Distribution System to be planned, designed and constructed to Operate economically, securely and safely whilst minimizing the environmental impact;
- the exchange of information and interaction between Licensed Distributors and Distribution System Users concerning any proposed development of Distribution System User Systems that are to be Connected to the Distribution System, or that may impact on the performance of the Distribution System or OETC and the Transmission System;
- the use of the Distribution System by Distribution System Users; and
- The Licensed Distributor to fulfill its obligations to OETC under the Grid Code.

DPC.3 Scope

In addition to the Licensed Distributor, DPC applies to all Distribution System Users of the Distribution Systems as follows;

- Embedded Power Producers with CDGensets;
- Embedded Power Producers with non CDGensets;
- Internally Interconnected Parties Connected to the Distribution System;
- OETC;

- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- Licensed Suppliers;
- RAEC if Connected to the Distribution System.

DPC.4 Planning Procedures

The Licensed Distributor and Distribution System Users shall each treat all data of or relating to one Distribution System User as confidential in relation to all other Distribution System Users, unless and to the extent that

(a) all affected Distribution System Users agree in writing to exchange such data, or

(b) this code or the Grid Code or any License necessarily requires its disclosure..

DPC.4.1 Planning Overview

DPC4 details information to be exchanged between the Licensed Distributor and Distribution System Users. It includes data that is necessary in order for the Licensed Distributor Distribution System to be developed in an efficient, coordinated and economic manner, and to enable the Licensed Distributor to comply with the conditions contained in its Licence.

Development of the Distribution System, involving its reinforcement or replacement of major components or extension, may arise for a number of reasons including, but not limited to:

(a) a development on a Distribution System User System already Connected to the Distribution System;

(b) the introduction of a new Connection or the modification of an existing Connection between a Distribution System User and the Distribution System;

(c) the introduction of a new Connection or the modification of an existing Connection between the Distribution System and the Transmission System;

(d) a new Connection between the Distribution System and an RAEC system; and

(e) the cumulative effect of a number of such developments referred to in (a) to (d) by one or more Distribution System Users or OETC.

Accordingly, the reinforcement or extension of the Distribution System may involve work:

- at a Connection Point where Distribution System User's Plant and/or apparatus is Connected to the Distribution System;
- on Distribution lines or other facilities which Connect that Connection Point to the remainder of the Distribution System;
- on Distribution lines or other facilities at or between points remote from that Connection Point; and
- At the interface between the Transmission System and the Distribution System.

The Distribution and Supply Licence requires the Licensed Distributor to produce an annual statement setting out for each of the three succeeding Operational Years, amongst other matters, information on the status of Distribution Capacity and such further information as shall be reasonably necessary to enable any potential Distribution System User to identify and evaluate the opportunities available when Connecting to the Distribution System.

DPC.4.2 Data to be provided by Distribution System Users to Licensed Distributor

Each Distribution System User shall submit to the Licensed Distributor the data listed in DPC4.2 and in DOC1.5 by the end of November of each year for each of the next three Operational Years to allow the Licensed Distributor to;

- meet its obligations under the Grid Code to supply data to OETC, and
- prepare the Three Year Capability Statement.

In addition to periodic updates of planning information a Distribution System User should give adequate notice of any significant changes to its System or operating regime to enable the Licensed Distributor to prepare its development plan, budget for, and implement any necessary System modifications. Such information should include any changes either increasing or decreasing in maximum Demand, transfer requirements or generating capacity as appropriate. In the event of unplanned changes in a Distribution System User's System or operating regime a Distribution System User shall notify the Licensed Distributor as soon as is practically possible to ensure any contingency measures, as necessary, can be implemented by the Licensed Distributor.

DPC.4.2.1 Generation and Demand Data

i) Power Producers with Embedded Gensets

Power Producers with Embedded CDGensets and Connected to the Distribution System are required to submit data to OETC in accordance with the Grid Code, OC2. Copies of that data shall also be submitted to the Licensed Distributor at the same time.

Power Producers with Embedded Gensets that are not Centrally Dispatched and are Connected to the Distribution System at voltages of 11kV or below will have supplied within their Connection Agreement, the data shown in Appendix A - A1.

Power Producers with Embedded Gensets that are not Centrally Dispatched and are Connected to the Distribution System at voltages above 11kV will have supplied within their Connection Agreement, additional data shown in Appendix A - A2.

In both of the above cases, Power Producers shall submit to the Licensed Distributor by the end of November of each year for each of the next three Operational Years any changes to this data or report that there is no change.

All Power Producers Connected to the Distribution System that have site Demand shall submit to the Licensed Distributor the maximum and minimum Active Power Demands for each week and typical weekly Demand profiles at time of daily peak Demand for each Connection Point by the end of November of each year for each of the next three Operational Years. The data provided should compliment the Genset Capacity provided in Appendix A to give a true state of Capacity/Demand at the site.

For Operational Years 4 and 5, Power Producers shall submit any expected changes to the Registered Capacity and the forecast maximum Active Demand at each site by the end of November of each year.

ii) Consumers with a peak Demand of greater than 1 MW

Consumers with a peak Demand of greater than 1 MW are required to submit data by the end of November of each year for each of the next three Operational Years to the Licensed Distributor in accordance with DOC1, Demand Forecast.

For Operational Years 4 and 5, Consumers shall submit the forecast maximum Active Demand at each site by the end of November of each year.

iii) Internally Interconnected Parties Connected to the Distribution System

Internally Interconnected Parties Connected to the Distribution System are required to submit data by the end of November of each year for each of the next three Operational Years to the Licensed Distributor in accordance with DOC1, Demand Forecast.

For Operational Years 4 and 5, Internally Interconnected Parties Connected to the Distribution System shall submit the forecast maximum transfers at each site by the end of November of each year.

iv) Licensed Suppliers

Licensed Suppliers shall submit data by the end of November of each year for each of the next three Operational Years to the Licensed Distributor in accordance with DOC1, Demand Forecast.

For Operational Years 4 and 5, Licensed Suppliers shall submit the forecast maximum Active Demand averaged across the Distribution System.

DPC.4.2.2 System Data

i) Reactive Compensation Plant

All Distribution System Users shall provide to the Licensed Distributor, information on any Reactive Compensation Plant Connected to a Distribution System, other than at Low Voltage, including:

- the Mvar capacitive or inductive rating of the apparatus and Plant and operating range if variable;
- details of any logic systems that automatically control the characteristics of the Reactive Compensation Plant such that the operating characteristics can be determined; and
- the Connection Points to the Distribution System.

ii) Lumped network susceptance (or capacitance)

When the Licensed Distributor so determines, it will be necessary for the Distribution System User to provide, at the request of the Licensed Distributor, details of the network capacitance (or susceptance) at nominal Frequency referred back to the Connection with the Distribution System and expressed as a single equivalent value.

This should include any shunt reactors that are not an integrated part of a cable system. Shunt reactors are considered an integrated part of a cable system if they are normally switched in or out of service with the cable.

It should not include:

- independently switched Reactive Compensation Plant Connected to the Distribution System User System; or
- any capacitance (or susceptance) of the Distribution System User's System inherent in the Reactive Power Demand.

iii) Fault infeeds

The following information shall be exchanged on fault infeed levels at Connection Points with the Distribution System between the Licensed Distributor and the Distribution System User when either party deems it reasonably necessary;

- the maximum and minimum 3-phase symmetrical and phase short circuit infeed;
- the X/R ratio under short circuit conditions; and
- in the case of interconnected Systems, appropriate equivalent network information.

iv) Interconnection impedance

For Distribution System User Systems that Operate in parallel with the Distribution System details of the interconnection impedance shall be exchanged between the Licensed Distributor and the Distribution System User. This information shall include an equivalent single impedance (resistance, reactance and shunt susceptance) of the parallel Distribution System User or Distribution System.

v) Demand transfer capability

Information shall be exchanged on Demand transfer capability where the same Demand may be supplied from alternative Licensed Distributors or Distribution System User points of Supply. This shall include the proportion of Demand normally fed from each Connection Point and the arrangements (manual or automatic) for transfer following a Planned Outage or a Forced Outage.

vi) Other data

The Distribution System User shall provide any other data that the Licensed Distributor may reasonably request.

DPC.4.3 Data to be provided by Licensed Distributor to Distribution System Users

Where the Licensed Distributor has received from a Distribution System User any information or data, or where the Licensed Distributor proposes to make modifications to the Distribution System which, in either case, in the reasonable opinion of the Licensed Distributor, may impact upon the System of any other Distribution System User, the Licensed Distributor will notify that Distribution System User of the proposals subject to any constraints relating to the timing of release of information or confidentiality provisions.

DPC.4.3.1 Transient overvoltage effects

Licensed Distributors and Distribution System Users may need to exchange data to enable an assessment, where necessary, of transient overvoltages to be made for busbars Connected to the Distribution System with respect to the Distribution System User/ Licensed Distributor ownership boundary.

Any information would relate to physical and electrical layouts, parameters, specifications and Protection details. In certain circumstances more detailed information may be needed and will be provided upon the reasonable request of the Licensed Distributor

DPC.4.4 Three Year Capability Statement

The Licensed Distributor is required under the terms of its Licence, on an annual basis, to prepare a statement showing, in respect of each of the three succeeding Operational Years;

(a) information on the status of Distribution Capacity and the anticipated future requirements of Distribution Capacity, including new Demand and new Generation Capacity;

(b) commentary prepared indicating the Licensed Distributor's views as to those parts of its Distribution System most suited to new Connections and Distribution of further quantities of electricity, including for new Capacity and Connection of Systems Operated by the Rural Area Electricity Company;

(c) information on any constraints that are foreseen;

(d) information relating to progress made with current investments;

(e) such further information as shall be reasonably necessary to enable any Person seeking use of System to identify and evaluate the opportunities available when Connecting to and making use of such System; and

(f) such other matters as shall be specified in directions issued by the Regulatory Authority from time to time for these purposes,

The Regulatory Authority may, upon application of the Licensed Distributor, relieve the Licensed Distributor from the obligation to prepare any such statement in respect of any period and any part or parts of its Distribution System.

The Licensed Distributor shall submit the Three Year Capability Statement to the Regulatory Authority by the end of October each year and send copies of the Three Year Capability Statement to OETC and PWP.

DPC.5 Application for Connection

Distribution System Users wishing to establish a new Connection Site or modify an existing Connection Site shall make an application to a Licensed Distributor for a Connection Agreement. The application shall include:

- a description (termed the Distribution System User development) of the apparatus and/or Plant to be Connected to the Licensed Distributor's System or the modification relating to Distribution System User's apparatus and/or Plant already Connected to the Distribution System;
- the Planning Data listed in Appendix B; and
- the desired completion date of the proposed Distribution System User development.

The Licensed Distributor shall process the Distribution System User's application and provide an offer for Connection within 90 calendar days, unless the Licensed Distributors considers the Connection to be a complex one in which case the time required for processing the application may be extended. The Licensed Distributors will, in any event, not delay the processing time unreasonably.

Any offer of Connection made by a Licensed Distributor will state that the applicant Distribution System User must accept within the period stated in the offer (which will be at least 14 calendar days) after which the offer automatically lapses. Acceptance of the offer commits the Licensed Distributor to works relating to that Distribution System User development and binds both parties to the terms of the offer.

The Distribution System User may appeal to the Regulatory Authority if it considers that the length of time for processing its information required for Connection is unreasonably long.

Appendix A Genset Data

A.1 Embedded Gensets not centrally Dispatched and Connected at voltages of 11kv or below

The Power Producer would have submitted the following data as part of the Connection Agreement. The Distribution System User must keep this data up to date and all changes are required to be submitted to the Licensed Distributor as part of the annual planning data submission.

Genset data

a	Terminal volts;	kV
b	Rated Capacity;	KVA
c	Rated Capacity;	kW
d	Maximum Active Power sent out	KWso max
	Reactive Power requirements (if any);	KVar
e	Type of Genset;	Synchronous, asynchronous, etc
f	Type of prime-mover;	
g	Anticipated operating regime of generation;	Continuous, intermittent, peak lopping
h	Fault level contribution;	kA
i	Method of voltage control;	
j	Generator transformer details;	As applicable
k	Requirements for top-up supplies and/or standby supplies;	

Interface Arrangements

a	The means of synchronisation between the Licensed Distributor and Distribution System User;
b	Details of arrangements for connecting with earth that part of the System Connected to the Distribution System;
c	The means of Connection and disconnection which are to be employed;
d	Precautions to be taken to ensure the continuance of safe conditions should any Earthed neutral point of the User System Operated at HV become disconnected from earth;

A.2 Embedded Gensets not centrally Dispatched and Connected at voltages above 11kV

(i) Technical data

a. Genset information (impedances p.u. on rating):

Type of prime mover;

Rated Capacity MVA;

Rated sent out Capacity Mwso;

Generator MW/MVAr Capability Chart (at lower voltage terminals);

Type of excitation system;

Inertia constant MW sec/MVA (whole machine);

Stator resistance;

Direct axis reactances;	Sub-transient	
	Transient	
	Synchronous	
Quadrature axis reactances;	Sub-transient	
	Synchronous	
Time constants;	Direct axis	Sub-transient
		Transient
Quadrature axis: (Stating either open or short circuit time constant);	Sub-transient	
Zero sequence;	Resistance	
	Reactance	
Negative sequence;	Resistance	
	Reactance	
Generator transformer: resistance;	Reactance	
	MVA rating	
	Tap arrangement	
	Vector group	
	Earthing	

b. Automatic Voltage Regulator

A block diagram for the model of the AVR system including the data on the gains, forward and feedback gains, time constants and voltage control limits;

c. Speed Governor & prime mover data

A block diagram of the Genset turbine control system and turbine time constants together with the turbine rating and maximum power;

(ii) Capacity and standby requirements

a. Registered Capacity and Minimum Generation of each CDGenset and Production Facility in MW;

b. CDGenset and Production Facility auxiliary Demand (Active Power and Reactive Power) in MW and MVAr, at Registered Capacity conditions. Consumers with own Gensets should include top-up requirements;

c. CDGenset and Production Facility auxiliary Demand (Active Power and Reactive Power) in MW and MVAr, under Minimum Generation conditions. Consumers with own Gensets should include top-up and standby requirements;

Appendix B User System Data

B.1.1 Introduction

Each User shall provide the Licensed Distributor with data of its User System relating to each Connection Site which may have an Operational Effect on the performance of the Distribution System.

All data must include the effects of any third party Connected to its User System.

B.1.2 Single line diagram

Each User shall provide the Licensed Distributor with a single line diagram showing all HV equipment and Connections together with equipment ratings and nomenclature for such equipment.

B.1.3 Reactive compensation equipment

The following information shall be provided for all reactive compensation equipment Connected to the User System at HV, other than Power Factor correction equipment associated directly with Consumer apparatus and Plant:

- type of equipment (eg fixed or variable, capacitive or inductive);
- rating or operating range in Mvar; and
- total harmonic distortion at the Connection Point.

B.1.4 Short circuit contribution to Transmission System

All Users, other than Power Producers, that have CDGenset(s) and/or motor Loads Connected to their Systems shall provide to the Licensed Distributor sufficient data for the Licensed Distributor to model the short circuit infeed to the Distribution System. The User is required to provide data calculated in accordance with Good Industry Practice.

The data should be provided for the condition of maximum infeed from that User System with all CDGensets Synchronised and all HV motors Connected to that User System. The User should ensure that the System Connections reflect credible System operating arrangements.

The following data shall be provided:

- symmetrical three-phase short circuit current infeed at the instant of fault.

B.1.5 Demand Transfer Capability

Where the Demand from one User could be supplied from more than one Connection Point, the User may request the Licensed Distributor to take this into account in designing the Connection Site. In these cases the following information must be supplied:

- the alternative Connection Point(s)
- the Demand which may be transferred under the loss of the most critical circuit from or to each alternative Connection Point (to the nearest 1MW/1Mvar)
- the arrangements for transfer (eg manual or automatic) together with the time required to effect transfer.

B.1.6 Switchgear

The following information must be provided for all switchgear (including circuit breakers, switch disconnectors and isolators) on all circuits Connected to the Connection Point including those at Production Facilities:

- rated voltage (kV)
- operating voltage (kV)
- rated current (A)
- rated short-circuit breaking current, 3-phase (kA) and 1-phase (kA)

B.1.7 Name Plate Data

Name plate data for all equipment.

Distribution Operating Code DOC1 – Demand Forecasting

Issued 5 Nov 2019

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Distribution Operating Code DOC1 – Demand Forecasting

DOC1.1 Introduction

DOC1 outlines the obligations on Licensed Distributors and Distribution System Users regarding the preparation of forecasts of both Active Demand and Reactive Demand on the Distribution System. DOC1 sets out the timescales within which Distribution System Users shall provide forecasts of both Active Demand and Reactive Demand to Licensed Distributors, and the timescales within which Licensed Distributors shall provide forecasts to Distribution System Users. The demand forecasts referred to in DOC1 are required for certain operational purposes, specifically:

- the **Operational Planning Phase** requires annual forecasts of Active Demand on the Distribution System for each of the succeeding 3 Operational Years;
- the **Programming Phase** requires weekly forecasts of Active Demand on the Distribution System for the period 1 to 6 weeks ahead; and
- the **Control Phase** requires daily forecasts of Demand Control data on the Distribution System for the day ahead.

DOC1 also deals with the provision of Demand Control data (as described in DOC3) in timescales consistent with the Operational Planning Phase, the Programming Phase and the Control Phase.

DOC1.2 Objective

The objectives of DOC1 are as follows:

- to specify the requirement for Licensed Distributors and Distribution System Users to provide unbiased forecasts of both Active Demand and Reactive Demand (when required) on the Distribution System within specified timescales. These forecasts are used by the Licensed Distributors for Operational Planning purposes, and in the Programming Phase and the Control Phase;
- to enable each Licensed Distributor to comply with its obligations under the Grid Code;
- to describe information to be provided by Distribution System Users to Licensed Distributors in the post Control Phase; and
- to describe certain factors to be taken into account by Licensed Distributors and Distribution System Users when preparing forecasts of both Active Demand and Reactive Demand on the Distribution System.

DOC1.3 Scope

In addition to the Licensed Distributors, DOC1 applies to Users of the Distribution System as follows;

- all Embedded Power Producers with total on-site Generation Capacity of over 5 MW;
- OETC;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- Licensed Suppliers;

- Internally Interconnected Parties Connected to the Distribution System; and
- RAEC, if Connected to a Distribution System.

DOC1.4 Information Flow & Co-ordination

DOC1.4.1 Demand Forecast Information

Each Licensed Distributor will co-ordinate and aggregate Demand forecast information provided by its Distribution System Users under this code for each Connection Point to meet the requirements of the Grid Code.

Demand data required from a Distribution System User refers to the Active Demand (kW or MW) only at the Connection Point to the Distribution System. Each Licensed Distributor may require certain Distribution System Users at certain times to provide the Reactive Demand (kvar or Mvar) as part of Demand data.

Where information is requested in writing throughout this code, facsimile transmission or other electronic means as agreed with the Licensed Distributor in writing may be used. All writing shall be in the English language.

DOC1.5 Operational Planning Phase

By the end of November of each year, each Distribution System User shall provide to the Licensed Distributor in writing, the forecast information listed below for each of the succeeding three Operational Years:

- Consumers specified in DOC1.3 shall submit to the Licensed Distributor the maximum and minimum Demands for each week and typical weekly Demand profiles at time of daily peak Demand for each Consumer Connection Point;
- Licensed Suppliers shall submit to the Licensed Distributor the total maximum and minimum Demands for each week and typical weekly Demand profiles at time of daily peak Demand for each Consumer Connection Point;
- Licensed Suppliers shall submit to the Licensed Distributor, Demand profiles of the amount and duration of each proposed use of their Consumer Demand Management that may result in a Demand change of 1MW or more during this period for each Consumer Connection Point; and
- Internally Interconnected Parties shall submit to the Licensed Distributor the total maximum and minimum Active Power flows entering and/or leaving the System for each week and typical weekly profiles of daily peak Active Power flows entering and/or leaving the System.

DOC1.6 Programming Phase

The Distribution System Users identified below shall provide the Licensed Distributors in writing by 10:00 hours on the first Saturday of each month forecasts of Active Demand on the Distribution System for the period of 1 to 6 weeks ahead.

- Consumers specified in DOC1.3 shall submit to the Licensed Distributors the maximum and minimum Demands for each day of the period and typical daily Demand profiles for each Connection Point;

- Licensed Suppliers shall submit to the Licensed Distributors the total maximum and minimum Demands for each day of the period and typical daily Demand profiles for each Connection Point;
- Licensed Suppliers shall submit to the Licensed Distributors Demand profiles of the amount and duration of each proposed use of their Consumer Demand Management that may result in a Demand change of 1MW or more on a daily basis during this period for each Connection Point; and
- Internally Interconnected Parties shall submit to the Licensed Distributors the total maximum and minimum Active Power flows entering and/or leaving the System for each day and typical daily profiles of Active Power flows entering and/or leaving the System at each Connection Point.

Distribution System Users shall submit to the Licensed Distributors details of any changes to the information provided above as soon as practicable.

DOC1.7 Control Phase

All Distribution System Users shall notify the relevant Licensed Distributor of any change greater than 1 MW to the data submitted in DOC1.6 for the following day. The information shall be provided in writing by 09:00 hours each day. The report shall state “No change” if that is the situation.

DOC1.8 Post Control Phase

The Distribution System Users identified below will provide the Licensed Distributors in writing by 10:00 hours each day certain information regarding Active Power data and Reactive Power data for the previous day.

- All Embedded Power Producers Connected to the Distribution System not subject to Central Dispatch with total on-site Generation Capacity over 5MW shall submit hourly Active Power and Reactive Power output to the Licensed Distributors.
- Consumers specified in DOC1.3 shall submit to the Licensed Distributors the Active Demand and Reactive Demand taken from the Distribution System for each hour of the previous day for each Connection Point.
- Licensed Suppliers shall submit to the Licensed Distributors the Active Demand and Reactive Demand taken from the Distribution System for each hour of the previous day for each Connection Point at 11kV.
- Licensed Suppliers shall submit to the Licensed Distributors for each application of its Consumer Demand Management for the previous day, the time, duration and Active Power Demand change that exceeded 1MW for each Connection Point.
- Internally Interconnected Parties shall submit to the Licensed Distributors the Active Power and Reactive Power flows entering and/or leaving the Distribution System at each Connection Point for each hour of the previous day.

DOC1.9 Licensed Distributors and Distribution System Users Forecasts

Licensed Distributors and Distribution System Users when preparing their Demand forecasts will take the following factors into account.

- Historical Demand data;
- Distribution System losses;
- Weather forecasts and the current and historic weather conditions;
- Demand transferred between Connection Points;
- the incidence of major events or activities known in advance;
- Demand Control of 1MW or more proposed to be exercised; and
- any other factors considered necessary.

DISTRIBUTION OPERATING CODE DOC2 – OPERATIONAL PLANNING

Issued 5 Nov 2019

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Distribution Operating Code DOC2 – Operational Planning

DOC2.1 Introduction

Operating Code, DOC2, is concerned with;

- the co-ordination of Planned Outages of apparatus and Plant for maintenance and construction work on the Distribution System;
- the provision of data to enable the Licensed Distributors to meet their obligations under the Grid Code; and
- Minimising the effect of Planned Outages on the security of supplies to Consumers.

DOC2.2 Objectives

The objectives of DOC2 are:

- to set out the operational planning procedure and timetable for the co-ordination of Outage requirements for apparatus and Plant on the Distribution System and on Users' Systems Connected to the Distribution System; and
- to specify the information to be provided by Distribution System Users to the Licensed Distributors to enable them to comply with the Grid Code.

DOC2.3 Scope

In addition to the Licensed Distributors, DOC2 applies to the following Distribution System Users:

- all Embedded Power Producers not Centrally Dispatched with a total on-site Generation Capacity over 5MW;
- all Embedded Power Producers subject to Central Dispatch;
- OETC;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- Licensed Suppliers;
- Internally Interconnected Parties Connected to the Distribution System;
- International Interconnected Parties Connected to the Distribution System;
- RAEC if Connected to the Distribution System.

DOC2.4 Procedures

Operational Planning is divided into three phases, specifically:

- the **Operational Planning Phase** requires annual forecasts and coordination of Planned Outages of the Distribution System and Gensets and of apparatus and Plant on User Systems Connected to the Distribution System for each of the succeeding 3 Operational Years;
- the **Programming Phase** requires updated weekly forecasts of the same data on the first Saturday of each month for the period 1 to 6 weeks ahead; and

- the **Control Phase** requires any changes to the above data for the day ahead.

Where information is requested in writing throughout this code, facsimile transmission or other electronic means as agreed with the Licensed Distributors in writing may be used. All writing shall be in the English language.

DOC2.5 Operational Planning Phase

DOC2.5.1 Information from Embedded Power Producers

By the end of November of each year, each Power Producer with Embedded CDGensets shall provide to the Licensed Distributors in writing, the forecast information listed below for each of the succeeding 3 Operational Years:

- Power Producers with Embedded CDGensets Connected to the Distribution System are required to submit to OETC data as required by Grid Code OC2. The required data is shown in Appendix A of DOC2. Copies of this data shall be submitted to the Licensed Distributors at the same time; and
- All Embedded Power Producers not subject to Central Dispatch with total on-site Generation Capacity over 5 MW shall submit to the Licensed Distributors, copied to PWP, its maximum and minimum Availability and output for each Genset for each week.

Power Producers shall submit details to the Licensed Distributors of any changes to the information so provided as soon as practicable.

DOC2.5.2 Information from other Distribution System Users of the Distribution System.

By the end of November of each year, each Distribution System User shall provide to the Licensed Distributors in writing, the information listed below for the succeeding Operational Year;

- details of proposed Outages of its apparatus and Plant on its System which may affect the performance of the Distribution System;
- details of trip testing and risks of the trip on apparatus Connected to the Distribution System; and
- other information which may affect the reliability and stability of the Distribution System.

Each Distribution System User shall submit details to the Licensed Distributor of any changes to the information so provided as soon as practicable.

DOC2.5.3 Information to be provided by the Licensed Distributors.

By the end of August of each year, each Licensed Distributor shall prepare coordinated schedule of Outages for Distribution HV apparatus and Plant including all major maintenance and construction Outages associated with their Distribution System.

The Outages shall be coordinated through consultation with OETC, PWP, Embedded Power Producers with CDGensets and other Power Producers with non-CDGensets, large Consumers and other relevant Distribution System Users to:

- minimise reductions in security to supplies and disconnections; and
- maximise the availability of CDGensets.

The Outage schedule shall be made available to all Distribution System Users that may be affected by the Outages. Any Distribution System User may request a copy of the Outage schedule.

A Distribution System User may request a change to an Outage but must provide;

- a reasonable case for change; and
- a range of alternative dates for the Outage.

The Licensed Distributor shall consider the proposal for change and if possible without disadvantaging other Consumers accept the change to a convenient date. However, the Licensed Distributor shall make the final decision on the timing and extent of the Outage. Where the change to Outage requirements affects CDGensets, the Licensed Distributor shall agree any changes with OETC.

DOC2.6 Programming Phase

DOC2.6.1 Information from Embedded Power Producers

By 10:00 hours on the first Saturday of each month, each Distribution System User shall provide to the Licensed Distributors in writing, the information listed below for each of the succeeding six weeks:

- all Embedded Power Producers subject to Central Dispatch and Connected to the Distribution System are required to submit to OETC data as required by Grid Code OC2. Copies of this data shall be submitted to the Licensed Distributors at the same time; and
- all Embedded Power Producers Connected to the Distribution System not subject to Central Dispatch with total on-site Generation Capacity over 5MW shall submit its maximum and minimum Availability and output for each Genset for each day for this period.

Power Producers shall submit details to the Licensed Distributors of any changes to the information so provided as soon as practicable.

DOC2.6.2 Information from other Distribution System Users of the Distribution System.

By 10:00 hours on the first Saturday of each month, each Distribution System User shall provide to the Licensed Distributors in writing, an update of the information provided in paragraph DOC2.5.2 and listed below for each of the succeeding six weeks:

- details of proposed Outages of its System which may affect the performance of the Distribution System
- details of trip testing and risks of the trip on apparatus Connected to the Distribution System
- other information which may affect the reliability and stability of the Distribution System.

All Distribution System Users shall submit details to the Licensed Distributors of any changes to the information so provided as soon as practicable.

DOC2.6.3 Information to be provided by the Licensed Distributors.

On the Monday following the first Saturday of each month, each Licensed Distributor shall update the coordinated schedule of Outages for Distribution HV apparatus and Plant including all maintenance and construction Outages for each of the next six weeks for its Distribution System.

The Outages shall be coordinated, where necessary, through consultation with OETC, PWP, Embedded Power Producers with CDGensets and other Power Producers with non-CDGensets, large Consumers and other relevant Distribution System Users to

- minimise reductions in security to supplies and disconnections, and
- maximise the availability of CDGensets.

The Outage schedule shall be made available to all Distribution System Users that may be affected by the Outages. Any Distribution System User may request a copy of the Outage schedule.

DOC2.7 Control Phase

DOC2.7.1 Information from Embedded Power Producers

All Distribution System Users shall notify the Licensed Distributors of any change greater than 1 MW to the data submitted in DOC2.6 for the following day. The information shall be provided in writing by 09:00 hours each day. The report shall be “No change” if that is the situation.

DOC2.7.2 Information from other Distribution System Users of the Distribution System.

All Distribution System Users shall notify the Licensed Distributors of any factors that may impede an Outage planned for the following day and update data previously provided with particular regard to;

- details of trip testing and risks of the trip on apparatus Connected to the Distribution System; and
- any information which may affect the reliability and stability of the Distribution

System. The information shall be provided in writing by 09:00 hours each day.

Appendix A Operating Parameters

This appendix is a copy of Appendix C in Grid Code OC2.

The following parameters are required for each CDGenset

Registered Capacity under reference conditions supported by curves showing changes in output for significant variables such as temperature.

For each CDGenset

(a) the minimum notice required to synchronise the CDGenset or a CCGT Module from a condition of de-synchronisation

(b) the minimum time between Synchronising different CDGensets or CCGT Module in a Production Facility

(c) the minimum CDGenset Active Power requirements on Synchronising, expressed as a block Load in the case of a Gas Turbine Genset or a Steam Turbine Genset

(d) maximum CDGenset, or CCGT Module, loading rates from synchronisation for the following conditions:

- Hot
- Warm
- Cold

(e) minimum time off Load

(f) maximum CDGenset, or in the case of a CCGT Module, deloading rates for the following conditions:

- Hot
- Warm
- Cold

(g) maximum allowable starts per Operational Year for each CCGT Module or part thereof, from the following conditions:

- Hot
- Warm
- Cold1

Distribution Operating Code DOC3 – Demand Control

Issued 5 Nov 2019

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Distribution Operating Code DOC3 – Demand Control

DOC3.1 Introduction

Operating Code DOC3 is concerned with Demand Control measures and the procedures for implementing such measures. The term “Demand Control” in DOC3 refers to measures that allow Licensed Distributors and OETC to secure a reduction in Demand in situations of insufficient Generation Capacity or where severe operating difficulties pose a threat to the stability of the Total System including the security of the Distribution System.

DOC3 deals with the following aspects of Demand Control;

- Consumer Demand Management initiated by the Licensed Distributors;
- Consumer Demand Management initiated by OETC;
- Planned manual de-energisation or emergency manual de-energisation of Demand initiated by the Licensed Distributors or OETC;
- Consumer Demand Management initiated by Licensed Suppliers;
- De-energisation of Demand by automatic Demand shedding equipment and automatic relays to preserve Total System security;
- Procedures for issuing and complying with Demand Control instructions; and
- Demand Control warnings.

DOC3.2 Objective

The objectives of DOC3 are as follows;

- to identify different methods of Demand Control and the procedures governing their implementation; and
- to clarify the obligations of Licensed Distributors, OETC and Distribution System Users as regards the development of procedures, and exchange of information, required for the implementation of Demand Control.

OETC has an obligation under Grid Code OC4 to ensure that Demand Control is used as a last resort and only after all other means of securing Total System security have been exhausted. DOC3 places similar obligations on Licensed Distributors and requires the Licensed Distributors to ensure that all parties affected by Demand Control are treated equitably.

DOC3.3 Scope

In addition to the Licensed Distributors, DOC3 applies to;

- Power Producers with Embedded Gensets;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- Licensed Suppliers;
- OETC;
- Internally Interconnected Parties Connected to the Distribution System;

- International Interconnected Parties Connected to the Distribution System; and
- RAEC if Connected to the Distribution System.

DOC3.4 Methods of Demand Reduction

Demand Control is implemented in a number of ways, including;

- Consumer Demand Side Management agreements;
- Emergency Manual Demand shedding;
- Planned Rota Demand Shedding; and
- De-energisation of Demand by automatic under-frequency relays.

The obligations of the Licensed Distributors, OETC and Distribution System Users in respect of these means of Demand Control are set out below. DOC3 complements the corresponding Grid Code OC4.

Where information is requested in writing throughout this code, facsimile transmission or other electronic means as agreed with the Licensed Distributors in writing may be used. All writing shall be in the English language.

DOC3.4.1 Consumer Demand Side Management Agreements

Consumers may have Demand Side Management (DSM) agreements with a Licensed Supplier. Licensed Suppliers shall consult and agree with the Licensed Distributor before entering into any DSM contracts with Consumers that provide for a reduction of Demand of 1MW or more. Licensed Suppliers must notify the Licensed Distributors and OETC of all DSM agreements and any changes thereto that provide for a reduction of Demand of 1MW or more.

DOC3.4.2 Emergency Manual Demand Shedding

OETC may implement Emergency Manual Demand Shedding by issuing an instruction to manually de-energise to Licensed Distributors and Users in accordance with Grid Code OC4. Each Licensed Distributor shall implement these instructions in accordance with plans prepared as set down in DOC3.5. DOC3.5 establishes the principles of the amounts and locations of Demand to be manually de-energised at a particular point in time or at specified Frequency levels.

Each Licensed Distributor shall implement an instruction issued by OETC to manually de-energise in accordance with the following arrangements;

(a) each Licensed Distributor shall make arrangements that allow it to comply with an instruction from OETC to manually de-energise Consumers on its Distribution System under Emergency Conditions within 30 minutes irrespective of Frequency. It must be possible to manually de-energise a proportion of Demand as determined by OETC;

(b) each Licensed Distributor shall consult with the appropriate Licensed Suppliers and other relevant Distribution System Users and agree the amounts and types of Demand to be de-energised over a range of percentage Demand de-energisations paying due attention to the need to protect certain classes of Consumers, e.g., hospitals, etc;

(c) each Licensed Distributor shall implement the instructions of OETC regarding manual de-energisation without delay, and the manual de-energisation must be achieved as soon as possible after the instruction is given by OETC. The instruction may relate to groups of Connection Points, an individual Connection Point or to an amount of Demand to be uniformly de-energised. The Licensed Distributor shall inform the Licensed Suppliers immediately of any warnings of de-energisations and also within five minutes following the de-energisations;

(d) Distribution System Users must abide by the instructions given by the Licensed Distributors;

(e) once manual de-energisations have been applied by a Licensed Distributor in accordance with an instruction from OETC, that Licensed Distributor or any Distribution System User shall not reconnect the manually de-energised Demand until OETC instructs the Licensed Distributor to do so and the process of reconnection must begin within 2 minutes of the instruction being given by OETC; and

(f) each Licensed Distributor shall provide OETC in writing by the end of October in each calendar year, in respect of the next following Operational Year, on a Connection Point basis, with the following information as set out in Appendix A;

- its total annual maximum Demand;
- the percentage value of the total annual maximum Demand that can be manually de-energised within timescales of 5, 10, 15, 20, 25, and 30 minutes, at least 40% of total demand must be capable of being de-energised; and
- confirm that a minimum of 20% of total Demand can be manually de-energised in the first 5 minutes following instruction from OETC.

Each Licensed Distributor will be notified by OETC of the events on the Transmission System that necessitated the instructions requiring manual de-energisation and will notify the Licensed Suppliers and other Users accordingly. In circumstances of protracted shortage of Generation Capacity or where a Government instruction has been given and when a reduction in Demand is envisaged by OETC to be prolonged, OETC will notify the Licensed Distributors of the expected duration of the de-energisation.

If OETC determines that emergency manual de-energisation is inadequate, OETC may itself manually de-energise and reconnect a Licensed Distributor or a part of its System as part of a Demand Control requirement under Emergency Conditions.

A Licensed Distributor may implement manual Demand shedding by issuing an instruction to manually de-energise Demand independent of OETC as a result of problems on the Distribution System. This may be required in circumstances such as;

- voltage instability on certain feeders;
- overloading of Plant e.g., a transformer or feeder; and
- planned maintenance whereby the Demand can not be fully supplied over remaining feeders.

Where a Licensed Distributor considers it necessary to implement Demand Control measures to preserve the integrity of the Distribution System, it may implement the necessary measures provided the impact upon the integrity of the Total System has been properly assessed. In such situations a Licensed Distributor shall endeavour to discuss the situation with OETC prior to the implementation of Demand Control measures and shall notify OETC as soon as possible

Licensed Distributors shall consult with the Licensed Supplier(s) and other relevant Distribution System Users during all stages of planning Demand de-energisation procedures and maintain fair treatment to all Distribution System Users. They shall keep the Licensed Supplier(s) and other relevant Distribution System Users informed of de-energisations and restorations after the event. Communications relating to agreed de-energisation schedules should be in writing. Communications relating to de-energisations and restorations may be by telephone but shall be confirmed in writing within 5 minutes.

DOC3.4.3 Planned Rota Demand Shedding

In the event of a sustained period of shortfall in the Generation Capacity and Demand balance, either for the Transmission System as a whole or for significant parts of the Transmission System or a Distribution System, manual de-energisation of Demand will be implemented on a rota basis.

Licensed Distributors shall develop Demand shedding rotas in consultation with OETC, Licensed Suppliers and other Distribution System Users. Demand shedding rotas shall ensure that available power is shared among affected parties on an equitable basis: groups of consumers can be de-energised for periods of up to one hour, after which their supplies shall be reconnected and another group of consumers de-energised. The parties shall pay due attention to the need to protect certain classes of Consumers, e.g., hospitals, etc., when determining Demand shedding rotas.

Planned Demand shedding rotas may be amended by OETC prior to implementation if, in OETC's opinion, operational considerations require it to do so and Licensed Distributors shall comply with such instructions. The Licensed Distributors will be notified by OETC of the total amount of Demand that shall be de-energised at different times.

Licensed Distributors shall consult with the Licensed Supplier(s) and other relevant Distribution System Users during all stages of planning rota Demand de-energisations and shall keep the Licensed Supplier(s) and other relevant Distribution System Users informed during the different stages of de-energisations and restorations. Communications relating to agreed de-energisation schedules should be in writing. Communications relating to de-energisations and restorations instructions may be by telephone but shall be confirmed in writing within 5 minutes.

DOC3.4.4 De-energisation of Demand by Automatic Under- Frequency Relays

Automatic Demand de-energisation through under-frequency relay operation is used to address short-term significant imbalances between Generation Capacity and Demand, and this would generally occur following the tripping of an amount of Generating Capacity beyond that covered by the Operating Reserve. It is a method of safeguarding the stability of the Total System when other actions, such as the use of the Operating Margin, have failed to stabilise or hold the Frequency within required operating limits.

Each Licensed Distributor shall make arrangements to allow approximately 40% of its annual maximum Demand to be de-energised by automatic under-frequency relays. These arrangements shall allow automatic de-energisation to occur in stages with specified proportions of Demand being de-energised at each level of Frequency. The proportion of Demand to be de-energised at each stage of falling Frequency shall be determined by OETC. OETC shall agree with Licensed Distributors those feeders that will be de-

energised. The parties shall pay due attention to the need to protect certain classes of Consumers, e.g., hospitals, etc., when determining automatic under-frequency Demand shedding.

Each Licensed Distributor shall comply with the following;

(a) the Demand of each Licensed Distributor that is subject to automatic under-frequency de-energisation will be split into discrete MW blocks;

(b) the number, location, size and the associated under-frequency settings of the relays associated with these blocks, shall be specified by OETC by the end of October in each calendar year following discussion with Licensed Distributors. OETC will review the arrangements for each discrete MW block annually, and prepare a schedule of the agreed arrangements covering all Licensed Distributors;

(c) the arrangements covering all Licensed Distributors in respect of each discrete MW block will ensure a reasonably uniform de-energisation within each Distribution System across all Supply Points;

(d) where conditions are such that following automatic under-frequency Demand de-energisation and the subsequent Frequency recovery, it is not possible to restore a large proportion of the total Demand so de-energised within a reasonable period of time, OETC may instruct a Licensed Distributor to implement additional Demand de-energisation manually, and restore an equivalent amount of the Demand that had been de-energised automatically. The purpose of such action is to ensure that a subsequent fall in Frequency will again be contained by the operation of automatic under-frequency Demand de-energisation;

(e) once an automatic under-frequency Demand de-energisation has taken place, the Licensed Distributor on whose Distribution System it has occurred, will not reconnect Demand until OETC instructs that Licensed Distributor to do so and then only in the amounts of Demand so instructed; and

(f) following the recovery of Frequency, OETC will issue instructions for the reconnection of Demand. Reconnection of Demand by Licensed Distributors must be achieved as soon as possible and the process of reconnection must begin within 2 minutes of the instruction being given by OETC.

Licensed Distributors shall consult with the Licensed Supplier(s) and other relevant Distribution System Users during the stages of planning under-frequency Demand de-energisations and shall pay due attention to protecting certain critical Consumers such as hospitals, etc. Licensed Distributors shall keep the Licensed Supplier(s) and other relevant Distribution System Users informed during the different stages of implementing de-energisations and restorations. Communications relating to agreed de-energisation schedules shall be in writing. Communications relating to de-energisations and restorations may be by telephone but shall be confirmed in writing within 5 minutes.

DOC3.5 Implementation of Demand Control

Licensed Distributors shall prepare procedures for the implementation of the Demand Control measures contained in DOC3. The Distribution Code Review Panel shall review and approve the procedures proposed by each Licensed Distributor. In drawing up procedures for the implementation of Demand Control measures, Licensed Distributors shall demonstrate that Demand Control will be used in an equitable manner.

When drawing up its proposals for the implementation of Demand Control measures each Licensed Distributor shall consult with Licensed Suppliers and with all Distribution System Users Connected to its Distribution System with Demands equal or greater than 1 MW. Different factors within the Licensed Distributors' territories may require that different proposals are necessary for each Licensed Distributor.

Where agreement cannot be achieved with a particular Distribution System User on the implementation of a Demand Control measure, the Licensed Distributor shall, after consulting with the Regulatory Authority, determine the least-worst case for the Distribution System User concerned taking into account the requirement to maintain the stability and security of the Total System including the Distribution System.

DOC3.6 Post Event Reporting

Following the issue of a Demand Control instruction by OETC, each Licensed Distributor shall notify OETC in writing that it has complied with OETC's instruction. The notification shall be provided to OETC within 5 minutes of complying with the instructions (both to shed and to restore) and shall include an estimate of the Demand reduction and the time at which the restoration was achieved.

Licensed Distributors shall provide further details to OETC of the timings, amount of Demand reduction and/or restoration actually achieved. This reporting shall be implemented for each Demand Control instruction and should be completed within 24 hours of the events.

DOC3.7 Warning System

OETC will issue advance warnings in accordance with Grid Code OC4 as soon as it considers an Alert state will require the implementation of Demand Control measures. A Demand Control warning issued by OETC will state whether Emergency Manual Demand Shedding or Planned Rota Demand Shedding is imminent Licensed Distributors shall take such preparatory action as they deem necessary in view of the warning. All Demand Control warnings will be of a form determined by OETC and will remain in force from the stated time of commencement until OETC issues notification of their cancellation, amendment or re-issue. The exception is a Demand Control Imminent Warning that will automatically lapse after 2 hours unless renewed by OETC.

Following the issue of a Demand Control warning, no Demand Control measures shall be implemented until OETC issues an instruction to do so.

OETC will issue a Demand Control Imminent Warning to Licensed Distributors who may subsequently receive instruction requiring Emergency Manual Demand Shedding.

OETC will issue a Demand Control Red Warning by 16:00 hours on the day ahead to Licensed Distributors who may receive instructions on the day ahead concerning Emergency Manual Demand Shedding or Planned Rota Demand Shedding. A Demand Control Red Warning will specify the period during which Demand shedding may be required and the Licensed Distributors to which it may apply, the percentage of Demand reduction that OETC may require and any other matters.

Following the receipt of warnings from OETC, the Licensed Distributors shall notify Licensed Suppliers and other relevant Distribution System Users of the content of the warnings.

Appendix A Emergency Manual Demand Reduction/De-energisation Summary Sheet

Connection Point (Name)	Annual maximum MW	% of group Demand de-energisation (Cumulative)						Remarks
		Minutes						
		5	10	15	20	25	30	

Notes: Data to be provided annually by the end of October to cover the following year.

Version 1.1

Distribution Operating Code DOC4 – Notice of Operations and Incidents, and Significant Incident Reporting

Issued 5 Nov 2019

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Distribution Operating Code DOC4 – Notice of Operations and Incidents, and Significant Incident Reporting

DOC4.1 Introduction

Operating Code, DOC4, requires Licensed Distributors and Distribution System Users to issue notices of all Operations and Incidents on their respective Systems that have or may have implications for the Distribution System or a Distribution System User's System.

DOC4 shall be considered complementary to Grid Code OC5 that requires OETC, Licensed Distributors and Distribution System Users to issue notices of all Operations and Incidents on their respective Systems that have or may have implications for the Transmission System or a Distribution System User's System.

Licensed Distributors may determine that an Incident shall be classified as a Significant Incident. DOC4 sets out the procedures for reporting and subsequent assessment of Significant Incidents.

DOC4 requires Licensed Distributors or a Distribution System User to prepare;

- a preliminary written Significant Incident report within 2 hours of the Licensed Distributor determining an Incident as a Significant Incident; and
- a full written Significant Incident report within 1 business day of the Licensed Distributor determining an Incident as a Significant Incident.

In addition, DOC4 contains requirements governing the content and the circulation of Significant Incident reports and their subsequent assessment and review by the Distribution Code Review Panel.

DOC4.2 Objective

The objectives of DOC4 are;

- to specify the obligations on Licensed Distributors and Distribution System Users regarding the issue of notices of Operations and Incidents on their respective Systems;
- to ensure that notices of Operations and Incidents provide sufficient detail to allow recipients of such notices to fully assess the likely implications and risks and take the necessary actions required to maintain the security and stability of the Distribution System or a Distribution System User's System;
- to specify the arrangements for reporting Incidents that Licensed Distributors have determined to be a Significant Incident; and
- to provide for the review of all Significant Incident reports by the Distribution Code Review Panel to assess the effectiveness of policies adopted in accordance with this Distribution Code.

DOC4.3 Scope

In addition to Licensed Distributors, DOC4 applies to;

- all Embedded Power Producers Connected to the Distribution System with total on-site Generation Capacity over 5 MW;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- OETC;
- Licensed Suppliers;
- Internally Interconnected Parties with Systems Connected to the Distribution System;
- International Interconnected Parties with Systems Connected to the Distribution System; and
- RAEC if Connected to a Distribution System.

DOC4.4 Notice of Operations

Licensed Distributors and relevant Distribution System Users shall issue notices concerning Operations on their respective Systems that have had or may have implications for the Distribution System or a Distribution System User's System. Without limiting the requirements of DOC4.4, notifications shall be issued for the following;

- where an Operational Instruction to be issued may have an effect on another Distribution System Users' System, apparatus or Plant;
- where apparatus and Plant is expected to be Operated in excess of its rated Capacity and may present a hazard to Persons;
- where there is an expectation of abnormal operating conditions;
- where there is increased risk of Operation of Protection; and
- in relation to testing, commissioning and maintenance.

DOC4.5 Procedure

DOC4.5.1 Operations on the Distribution System

In the case of an Operation on the Distribution System that will have or has had an Operational Effect on the System of another Distribution System User, the Licensed Distributor will notify the Distribution System User whose System will be, is, or has been affected.

DOC4.5.2 Operations on a Distribution System User System

In the case of an Operation on the System of a Distribution System User that will have or has had an Operational Effect on the Distribution System, the Distribution System User will notify the Licensed Distributor. Following notification by the Distribution System User, the Licensed Distributor will notify any other Distribution System Users whose Systems will be, is, or has been affected.

DOC4.5.3 Form of Notice of Operations

All operational notifications must be made promptly. Notifications and responses to the notifications may be made by telephone but must be confirmed in writing within 5 minutes. Where information is requested in writing throughout this code, facsimile transmission or other electronic means as agreed with the Licensed Distributors in writing may be used. All writing shall be in the English language.

The appropriate party (as described in DOC4.5.1 and DOC4.5.2) will issue a notification (and respond to any questions asked) of any Operation that has arisen independently of any other Incident or Operation.

The notification will;

- describe the Operation (but is not required to state its cause);
- provide sufficient detail to enable the recipient of the notification to reasonably consider and assess the implications, and risks arising; and
- include the name of the Person reporting the Operation on behalf of the Licensed Distributor or the Distribution System User.

The recipient of a notification may ask questions to clarify the notification and the provider of the notification will, insofar as it is able, answer any questions raised.

DOC4.5.4 Timing

A notification will be given as far in advance as possible. Notification of future Operations shall be given in sufficient time as will reasonably allow the recipient to consider and assess the implications and risks arising from the Operation.

DOC4.6 Notification of Incidents

Licensed Distributors and Distribution System Users shall issue notifications of Incidents on their respective Systems that have had or may have implications for the Distribution System or a Distribution System User's System. Without limiting the requirements of DOC4.6, Incident notifications shall be issued for the following;

- where apparatus and Plant has been Operated in excess of its rated Capacity and presented a hazard to Persons;
- the activation of any alarm or indication of any abnormal operating condition;
- adverse weather conditions being experienced;
- breakdown of, faults on or temporary changes in the Capacities of apparatus and Plant;
- breakdown of or faults on control, communication and Metering Systems;
- increased risk of inadvertent operation of Protection; and
- testing, commissioning, maintenance.

DOC4.6.1 Incidents on the Distribution System

In the case of an Incident on the Distribution System, which has had or may have an Operational Effect on the System of a Distribution System User, a Licensed Distributor will notify the Distribution System User whose System will be, is, or has been affected.

DOC4.6.2 Incidents on a Distribution System User System

In the case of an Incident on the System of a Distribution System User, which has had or may have an Operational Effect on the Distribution System, the Distribution System User will notify the Licensed Distributor. Following notification by the Distribution System User, the Licensed Distributor will notify any other Distribution System Users on whose System will be, is, or has been affected.

DOC4.6.3 Form of Notification

Incident notifications must be issued promptly. Notifications and responses to them may be made by telephone but must be confirmed in writing within 5 minutes

The appropriate party (as described in DOC4.6.1 and DOC4.6.2) will issue a notification (and any response to questions asked) of any Incident that has arisen independently of any other Incident or Operation.

The notification will;

- describe the Incident (but is not required to state its cause);
- be of sufficient detail to enable the recipient of the notification to reasonably consider and assess the implications, and risks arising; and
- include the name of the Person reporting the Incident on behalf of the Licensed Distributor or the Distribution System User.

The recipient of a notification may ask questions to clarify the notification and the provider of the notification will, insofar as it is able, answer any questions raised.

DOC4.6.4 Timing

An Incident notification will be given as soon after the Incident as possible to allow the recipient to consider and assess the implications and risks arising from the Incident.

DOC4.7 Significant Incident Reporting

A Licensed Distributor may determine that an Incident reported by it or a Distribution System User shall be classified as a Significant Incident. The Licensed Distributor shall promptly notify all potentially affected Distribution System Users by telephone that such a determination has been made and that procedures governing Significant Incident reporting are to be followed. The Licensed Distributor shall confirm such notice within 5 minutes by facsimile or other electronic means. All affected Distribution System Users shall acknowledge receipt of the notification in writing within 5 minutes.

Without limiting this general description, Significant Incidents will include all of the following;

- All trips that lead to supply interruption on the 33 kV.
- Any trips that leads to supply interruption of more than 2 hours on an 11 kV networks up to the distribution substations
- Any interruptions for a distribution substation for more than 3 hours.
- Any supply interruption on low voltage feeder networks that exceeds 6 hours or is reasonably considered to be a significant Incident based on the scale of affected customers

- Voltage excursion outside normal operating limits
- System Instability.
- Overloading (i.e., loading in excess of the rated capacity) of system circuits, apparatus and plant; and
- Breeches of Safety Rules or procedures that resulted in danger or injury to members of the public or to licensed distributor or distribution system user employees or their representatives.

DOC4.7.1 Timing of Significant Incident Reporting

A Licensed Distributor or the Distribution System User must produce a notification of Significant Incident within 2 hours and a preliminary written significant incident report within 2 business days of the Licensed Distributor or the Distribution System User receiving notification that the Licensed Distributor has determined an Incident to be a Significant Incident.

The preliminary written Significant Incident report shall cover in outline terms the matters specified in Appendix A.

A Licensed Distributor or the Distribution System User must produce a full written Significant Incident report within two weeks of the Licensed Distributor or the Distribution System User receiving notification that the Licensed Distributor determined an Incident to be a Significant Incident

DOC4.7.2 Form of Significant Incident Report

The full written Significant Incident report shall provide a full review of the Incident including at least all the matters specified in Appendix A.

The full Significant Incident report will contain confirmation of the (oral) Significant Incident notification together with full details relating to the Significant Incident. The Significant Incident report shall cover in the full and comprehensive detail at least those matters specified in Appendix A.

DOC4.7.3 Distribution of Significant Incident Report

In the case of an Incident that has been reported by a Licensed Distributor to a Distribution System User(s), and subsequently determined by the Licensed Distributor to be a Significant Incident, the Licensed Distributor will provide a full written Significant Incident report to the Distribution System User(s) and the Regulatory Authority. The Distribution System User(s) shall not pass the report to other Distribution System Users.

In the case of an Incident that has been reported by a Distribution System User to a Licensed Distributor, and subsequently determined by the Licensed Distributor to be a Significant Incident, the Distribution System User shall provide a full written Significant Incident report to the Licensed Distributor. The Licensed Distributor will not pass this report to other affected Distribution System Users but may use the information contained therein in preparing a report to OETC or another Distribution System User in relation to the Significant Incident and in the preparation of a report to the Regulatory Authority.

DOC4.8 Evaluation of Significant Incidents

Licensed Distributors shall maintain indexed records of all Significant Incident reports and shall review each report to determine whether there has been any lack of compliance with the Distribution Code. The index shall be maintained electronically and use the format shown in Appendix B

Each month or other period to be agreed with the Distribution Code Review Panel, each Licensed Distributor shall produce a summary report of Significant Incidents. The report shall comprise additions to the index of Significant Incident reports since the last summary report together with commentary of the Significant Incidents added to the index. The summary shall draw specific attention to any lack of compliance with the Distribution Code and to any areas where there may be a need to modify the Distribution Code.

The Distribution Code Review Panel shall make recommendations at any time including proposed modifications to the Distribution Code arising from its review of Significant Incident reports.

DOC4.9 Alerts

Whenever OETC becomes aware of any factors likely to give rise to an Emergency Condition or to unusual operating conditions, OETC, in accordance with Grid Code OC5, shall send an Alert to Licensed Distributors and other Distribution System Users who may be adversely affected by such disturbances etc.

The Alert will indicate the likely reason for the disturbance, the severity and duration of the disturbance and duration of the Alert period. Each Licensed Distributor shall forward the information contained in the Alert to Licensed Suppliers and other Distribution System Users who may be adversely affected by such disturbances etc.

The following list, which is not exhaustive, gives conditions that may give rise to an Alert;

(a) Tripping of any 220 kV, 132 kV or any multiple tripping of 66kV or 33kV apparatus;

(b) Tripping of a CDGenset;

(c) Condition where the Operating Margin is below the agreed standard;

(d) The voltage or Frequency going outside operational limits;

(e) Important events (e.g., National Day celebrations);

(f) Major testing;

(g) Accidents.

Licensed Distributors receiving the Alert shall acknowledge receipt by facsimile or other agreed electronic means and shall report any resulting events in accordance with the procedures set down in DOC4.

DOC4.10 Operational Logs

Each Control Centre of each Distribution System User shall maintain an Operational Log of each Operational Instructions issued and received, Incident notification issued or received, and all relevant aspects of Significant Incident reporting. The Operational Log shall record all acknowledgements of notices and any other matters relevant to the Operation of the Distribution System.

Each log shall record as a minimum the following information;

- each day shall commence on a new page that will be dated;
- each entry shall record the name of the Person giving the Operational Instructions, report, etc;

- each entry shall record the name of the Person receiving the Operational Instructions, report, etc;
- each entry shall record the time at which the instruction was given/received;
- each entry shall record the substation name and apparatus/Plant label or number to which the instruction refers;
- every instruction, etc shall be entered on a new line;
- the isolation of apparatus and Plant and the Connection and disconnections of main earths shall be separately recorded;
- the number and location of temporary earths and their removal shall be recorded either in the Operational Log or in a log under the control of the Safety Coordinator;
- the issuing of Safety Permits and their clearance shall each be separately recorded; and
- the numbers of individual Safety Permits shall be recorded.

DOC4.11 Communications

DOC4.11.1 Normal

Normal communications between operational sites shall be by telephone with confirmation by facsimile or other electronic means as agreed in writing.

Licensed Distributors, OETC and all Users will maintain lists of names, telephone and facsimile contact numbers for all relevant operational sites. The lists of contact names and numbers shall be provided in writing prior to the time that Users Connect to the Distribution System. All parties must up-date their lists and circulate to all relevant parties (in writing) whenever the information changes.

DOC4.11.2 Emergency

OETC are required to prepare an emergency communications plan, as set down in Grid Code OC5, whereby in the event of failure of normal communication routes, a priority ranked order of alternative routes e.g. the National telephone service, mobile telephones, etc. is agreed in consultation with all Grid Code Users. The plan shall contain names of contacts and alternative contact details for each operational group of each Grid Code User.

Each Licensed Distributor shall prepare and agree a similar emergency communications plan with respect to the Distribution System Users Connected to its Distribution System

Licensed Distributors will review and update the emergency communications plans each year and circulate the new plans to all Distribution System Users Connected to its Distribution System including OETC.

Appendix A Significant Incident Report

Information, if applicable to the Significant Incident and to the relevant Distribution System User (or Licensed Distributor, as the case may be) that shall be included in a written Significant Incident report prepared in accordance with DOC4.

1. Time and date of Significant Incident
2. Location
3. Apparatus and/or Plant directly involved (not merely affected by the event) including numbers and nomenclature
4. Description of Significant Incident including probable causes
5. Demand (in MW) and/or Generation (in MW) interrupted and duration of interruption
6. Genset – change in Availability
7. Estimated (or actual) time and date of return to service and/or return to pre-Incident Availability.
8. Damage to apparatus or Plant, as known
9. Damage to Distribution System, as known
10. Persons and/or members of the public injured, if known
11. Any other relevant material

Appendix B Format of index to Significant Incident Reports

Licensed Distributor ……

Reference number	Date of Incident	Location	Brief description of Incident	Apparatus or Plant involved and whether damaged	Persons or members of public injured

Notes:

1 Reference numbers shall be unique and used in sequential order

Distribution Operating Code DOC5– Safety Co-ordination

Issued 5 Nov 2019

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Distribution Operating Code DOC5– Safety Co-ordination

DOC5.1 Introduction

DOC5 sets out the procedure to be used by Licensed Distributors and Distribution System Users for the co-ordination, establishment and maintenance of the necessary Safety Precautions when work and/or testing is to be carried out on apparatus to allow it to be carried out safely and Licensed Distributors to meet their statutory requirements.

DOC5 requires Licensed Distributors (and their agents) and Distribution System Users (and their agents) to Operate in accordance with approved Safety Rules, in order to ensure safe working conditions for Persons working on or in close proximity to Distribution System electrical apparatus and Plant and for Persons who may have to work or use Distribution System electrical apparatus and Plant at an interface.

In the event of a conflict between this Distribution Operating Code DOC5 - Safety Co-ordination and any other section of the Distribution Code, DOC5 shall take precedence.

The following terms shall have the meaning ascribed to them below for the purposes of DOC5 only:

"HV Apparatus" means High Voltage electrical circuits forming part of a System on which Safety from the System may be required or on which Safety Precautions may be applied to allow work to be carried out on a System.

"Isolation" means the disconnection of apparatus from the remainder of the System in which that apparatus is situated by either of the following:

- an Isolating Device maintained in an isolating position. The isolating position must be maintained and/or secured by a method that accords with Safety Rules approved by a Licensed Distributor or
- an adequate physical separation which must be in accordance with, and maintained in accordance with Safety Rules approved by the relevant Licensed Distributor. If it is required by the approved Safety Rules a Caution Notice must be placed at the point of separation.

"Earthing" means a way of providing a Connection between conductors and general mass of earth by an Earthing Device which is maintained and/or secured in position in accordance with Safety Rules approved by the Licensed Distributor.

DOC5.2 Objective

The general objective of DOC5 is to allow work and/or testing on the Distribution System or apparatus that is Connected to the Distribution System to be carried out safely.

DOC5.3 Scope

In addition to Licensed Distributors, DOC5 applies to;

- Embedded Power Producers;
- Internally Interconnected Parties with Systems Connected to the Distribution System;
- International Interconnected Parties with Systems Connected to the Distribution System;
- Consumers Connected to the Distribution System with a maximum Demand equal to or greater than 1 MW;
- Licensed Suppliers;
- OETC;
- any other party reasonably specified by a Licensed Distributor;
- all contractors/agents of Licensed Distributors or Distribution System Users working on the Distribution System or at or across operational boundaries; and
- RAEC if Connected to a Distribution System.

DOC5.4 The Safety Rules

Safety procedures for Persons working on or in close proximity to Distribution System apparatus and Plant are governed by the Licensed Distributors' Safety Rules (and any future revisions of these rules) as detailed in:

- MEW Safety Rules (Electrical and Mechanical) Second Edition, issued 1989, amended 1995.

Safety procedures will normally involve switching out and suitably isolating and Earthing electrical apparatus and Plant to ensure that it cannot be made live before and during work on that apparatus and Plant unless 'live' working is allowed within the Safety Rules.

Licensed Distributors shall review the Safety Rules every twelve months. The review shall consider any implications arising from but not limited to;

- accidents on the Licensed Distributor, OETC or Distribution System User sites at the interface;
- issues arising from differences between the Safety Rules of the Licensed Distributor and any interfacing Distribution System User and OETC;
- reports from the Licensed Distributor staff concerning the application of the Safety Rules; and
- any other relevant matter.

Each Licensed Distributor shall prepare a report of each review and summarise in the report relevant events considered as part of the review. The report may make recommendations for changes to the Safety Rules, the implementation of the Safety Rules, or amendments to codes of practice to support the Safety Rules. The report shall be presented to the Distribution Code Review Panel for its consideration and review and then presented to the Grid Code Review Panel and the Regulatory Authority for overall consideration of Safety Rules.

DOC5.5 Safety at the interface

DOC5.5.1 Interface with OETC

At Connection Points between the Distribution System and the Transmission System, Licensed Distributors shall comply with the requirements of Grid Code OC6.

DOC5.5.2 Interface with Distribution System Users at HV

All Distribution System Users Connecting to HV Apparatus and Plant of the Distribution System must provide the Licensed Distributor with a copy of their Safety Rules. Each Licensed Distributor shall ensure the User Safety Rules provide for at least the same degree of Safety as the Licensed Distributor Safety Rules. If a Licensed Distributor is dissatisfied with any aspect of a User's Safety Rules the Licensed Distributor may require, following consultation with the Distribution System User, all relevant work and procedures to be undertaken according to the Licensed Distributor's Safety Rules.

All Distribution System Users Connecting to HV Apparatus and Plant of the Distribution System must approve Designated Operators that are deemed by the relevant Distribution System User to be competent to carry out the procedures in the agreed Operational Instructions. The approvals must be in writing and copies must be sent to Licensed Distributors.

Each Licensed Distributor in consultation with Distribution System Users shall develop for each Distribution System User HV site a Site Responsibility Schedule (referred to in Distribution Connection Conditions, clause DCC.9.2). The Site Responsibility Schedule shall detail the demarcation of responsibility for the safety of the Licensed Distributor Persons and Designated Operators carrying our work or testing at the Distribution System User's Connection Site and on circuits that cross the Distribution System User's site at any point.

Each Licensed Distributor shall issue operational procedures for each Distribution System User HV site. The operational procedures shall include, but are not limited to;

- detailed switching sequences (which meet as a minimum, the requirements of the Licensed Distributor's Safety Rules) to be followed for operational, fault and emergency switching;
- procedures for control and Operations;
- identification of operational boundaries; and
- the identity of the Licensed Distributor representatives (or its agents) and Distribution System Users (or their agents) who are authorised to attend the Distribution site and/or facility for operational purposes or during emergencies.

Each Licensed Distributor and each Distribution System User will co-operate in developing procedures and agreements on any matters that may be relevant for ensuring overall site safety and, in particular, safety during work or testing at or near to interface equipment.

In the event of a modification or change in operational practices, which has or may have an Operational Effect at a Distribution System User site or the circuits crossing that site at any point, Licensed Distributors and the Distribution System Users shall review the adequacy of overall site safety.

Adequate means of isolation shall be provided at the interface to allow work to be carried out safely at the interface or either side of the interface by the Licensed Distributor and each Distribution System User.

Where necessary adequate facilities for earthing apparatus and/or Plant shall be provided at either side of the interface to allow work to be carried out safely at the interface or on either side of the interface.

DOC5.5.3 Interface with Distribution System Users at LV

All Distribution System Users Connecting to LV apparatus and Plant of the Distribution System must work in accordance with the Safety Rules of the Licensed Distributor.

Distribution Operating Code DOC6 – Contingency Planning

Issued 5 Nov 2019

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Distribution Operating Code DOC6 – Contingency Planning

DOC6.1 Introduction

Operating Code DOC6, Contingency Planning, requires each Licensed Distributor to develop strategy to be implemented to support OETC during Emergency Conditions such as a Total System Shutdown or a Partial System Shutdown and in response to other major System Incidents in accordance with Grid Code OC7.

A Partial System Shutdown or a Total System Shutdown can have widespread implications for electricity Consumers and it is imperative that Licensed Distributors have arrangements in place to support OETC in such situations.

DOC6 includes arrangements for the Operation of the Distribution System where local control is given to a Licensed Distributor to co-ordinate its network with the support of Embedded Gensets and to Operations under loss of communications.

It is also important that Licensed Distributors and Users are aware of the procedures, and cooperate fully in the implementation of the procedures, through which OETC can return the Total System to normal operating conditions.

DOC6.2 Objective

The objectives of DOC6 are;

- to require Licensed Distributors to develop strategies to support OETC in the event of a Partial System Shutdown or a Total System Shutdown;
- to require Licensed Distributors to produce and maintain comprehensive System Normalisation Procedures covering both Partial System Shutdown and Total System Shutdowns;
- to provide for the cooperation of Users with the formation and execution of System Normalisation Procedures;
- to provide for the development and implementation of communications between OETC, Licensed Distributors and Users when dealing with a System Incident; and
- to ensure that Licensed Distributors' and Users' Persons who will be involved with the implementation of System Normalisation Procedures, are adequately trained and familiar with the relevant details of the procedures.

DOC6.3 Scope

In addition to the Licensed Distributors, DOC6 applies to;

- Embedded Power Producers;
- Consumers Connected to the Distribution Network where a Licensed Distributor considers it necessary.
- Licensed Suppliers;
- OETC;
- International Interconnected Parties Connected to the Distribution System;
- Internally Interconnected Parties Connected to the Distribution System; and
- RAEC if Connected to the Distribution System.

DOC6.4 Terms

For the purposes of this section of the Distribution Code, the term;

- **"Incident Centre"** means a centre established as determined by OETC under Grid Code OC7 following a Significant Incident to provide a focal point for communication and the dissemination of information between OETC and senior management representatives of Licensed Distributors and relevant Users.
- **"Power Island"** means a group of Production Facilities together with complementary local Demand normally part of the Total System, but disconnected from any other power source or the Total System following a Significant Incident. (A group may contain only a single Production Facility)
- **"System Normalisation Strategy"** means the strategy setting out the procedures for the restoration of the Transmission System and the Distribution Systems following a major Incident.
- "**System Incident Communications"** procedures are procedures agreed between OETC, Licensed Distributors and Users to ensure secure communications during Significant Incidents.
- **"System Incident"** means a Significant Incident that gives rise to a major disruption to the normal Operation of the Total System.

DOC6.5 System Normalisation Strategy

In accordance with Grid Code OC7, OETC are required to develop a System Normalisation Strategy to be implemented during Emergency Conditions such as a Partial System Shutdown or Total System Shutdown of the Total System and other major System Incidents.

Each Licensed Distributor shall develop a System Normalisation Strategy to assist OETC during such Emergency Conditions. The overall objectives of the System Normalisation Strategy shall be as follows:

- restoration of the Distribution System and associated Demand in the shortest possible time following OETC instructions, taking into account any operational constraints including Embedded Gensets and Distribution System constraints; and

- provide for effective communication routes and arrangements to enable senior management representatives of Licensed Distributors, OETC and Users, who are authorised to make binding decisions on behalf of Licensed Distributors, OETC or a User to communicate with each other during a System Incident.

The System Normalisation Strategy will provide for the detailed implementation of the following;

- following notification by OETC to a Licensed Distributor that a Total System Shutdown or a Partial System Shutdown exists and that OETC intends to implement System Normalisation Procedures, the Licensed Distributor shall ensure that the Distribution System is in a suitable state to assist Demand restoration as required;
- identification of separate groups of Embedded Gensets together with complementary local Demand that may be grouped to assist System restoration following OETC instructions; and
- step by step restoration of Demand (and Embedded Genset groups) in accordance with OETC instructions.

DOC6.6 System Normalisation Procedures

In the event of Emergency Conditions such as a Total System Shutdown or Partial System Shutdown. Licensed Distributors will receive an Alert from OETC notifying Users that OETC intends to implement System Normalisation Procedures. OETC will notify Users at the time of a System Incident of the particular System Normalisation Procedure to be implemented for that System Incident. The form of the Alert is set out in Grid Code OC7.7.2

The System Normalisation Procedures will be developed and maintained by OETC in consultation with other Users as appropriate in accordance with Good Industry Practice and will be subject to periodic review by the Grid Code Review Panel.

The System Normalisation Procedures shall provide for;

- procedures to establish an Incident Centre immediately following a major System Incident;
- a decision on the location of an Incident Centre; and
- the operational responsibilities and requirements of an Incident Centre, noting that such an Incident Centre will not have any responsibility for the Operation of the Systems but will be the focal point for communication and the dissemination of information between OETC and senior management representatives of Licensed Distributors and relevant Users.

DOC6.6.1 Licensed Distributor and User responsibilities

Each Licensed Distributor and User shall follow OETC's instructions during a System Incident and restoration process, subject to safety of Persons and the Licensed Distributors' and Users' apparatus and Plant.

It shall be the responsibility of each Licensed Distributor to ensure that any of its Persons and those of any relevant Users who may reasonably be expected to be involved in System Normalisation Procedures are familiar with, and are adequately trained and experienced in their standing instructions and other obligations so as to be able to implement the procedures notified by OETC.

DOC6.6.2 Black Start procedure

A Licensed Distributor will only be involved in a Black Start procedure to the extent that OETC instructs. The procedure for a Black Start situation will be that specified by OETC at the time of the Black Start situation. Licensed Distributors shall abide by OETC instructions during a Black Start situation provided the instructions are to Operate within the declared operational capabilities of its apparatus and Plant.

Licensed Distributors may receive instructions from OETC in connection with;

- An Embedded Production Facility with Black Start capability relating to the commencement of Generation output; and
- the restoration of Demand by a Licensed Distributor.

The procedure for a Black Start will follow the following stages as instructed by OETC;

- an instruction to a Production Facility with Black Start capability to start-up a CDGenset as soon as possible;
- OETC will endeavour to stabilise that CDGenset by instructing a Licensed Distributor to Connect appropriate Demand;
- following which OETC may instruct the start-up and Synchronisation of the remaining Available Gensets at that Production Facility and their loading with appropriate Demand to create a Power Island;
- if during this Demand restoration process any Genset cannot keep within its safe Operating Parameters because of Demand conditions, OETC will, where possible, either instruct Demand to be altered or will instruct a Licensed Distributor to re-configure its System to alleviate the problem being experienced by the Power Producer;
- as part of the Black Start strategy, Licensed Distributors with Embedded Gensets within their Distribution System which have become islanded, may in liaison with OETC sustain and expand these islands. Licensed Distributors will inform OETC of their actions and will not re-Synchronise to the Total System without OETC agreement; and
- OETC may instruct a Licensed Distributor, where possible, to interconnect Power Islands to achieve larger sub-Systems, and subsequently may instruct the interconnection of these sub-Systems to form an integrated System. This should eventually provide for the return of the Total System to normal operating conditions.

OETC shall inform Licensed Distributors and Users of the end of a Black Start situation and the time at which the Total System resumed normal Operation. Licensed Distributors shall keep Licensed Suppliers and other relevant Users informed at all significant stages of the Black Start and of the end of a Black Start situation.

All notifications must be made promptly. Notifications and responses may be made by telephone but must be confirmed within 5 minutes in writing. Where information is requested in writing throughout this code, facsimile transmission or other electronic means as agreed with the Licensed Distributor in writing may be used. All writing shall be in the English language.

DOC6.6.3 Re-Synchronisation procedures

Where there is neither a Partial System Shutdown nor Total System Shutdown but parts of the Total System are out of Synchronism with each other, OETC will instruct Users to regulate Generation output or Demand to enable the separate parts to be re-Synchronised. OETC will inform the relevant Users when re-Synchronisation has taken place.

Licensed Distributors shall prepare outline plans to either reconnect Demand to alternative Connection Points or to disconnect Demand in these circumstances when OETC so instructs.

OETC will issue whatever revised Dispatch Instruction are required to enable re-Synchronisation and to return the Total System to normal Operation.

DOC6.7 System Incident procedures

Grid Code OC5 - Operational Event Reporting, Communication and Liaison sets out the procedures for the exchange of information and follow up reporting between OETC, Licensed Distributors and Users in relation to events that have an impact on the Total System. An event may be either an Operation or an Incident. OETC will define certain Incidents as Significant Incidents; other more severe Incidents such as a Partial System Shutdown will be defined as System Incidents.

DOC6.7.1 Incidents defined by OETC

In certain circumstances, OETC may require an Incident Centre to be established to coordinate the response to a System Incident and to avoid placing further stress on existing operational control arrangements of OETC, Licensed Distributors and Users.

OETC will inform Licensed Distributors and Users promptly that an Incident Centre is to be established and request all relevant Licensed Distributors and Users to implement System Incident Communications procedures. OETC will specify the responsibilities and functions of the Incident Centre and the relationship with existing operational and control arrangements. During a System Incident, normal communication channels for operational control communication between Licensed Distributors and OETC and Users will continue to be used.

OETC will decide when conditions no longer justify the need to use the Incident Centre and will inform all relevant Users within 15 minutes by facsimile or other agreed electronic means accordingly.

DOC6.7.2 Incidents defined by a Licensed Distributor

In certain rare situations, Licensed Distributors may declare a System Incident on their Distribution System. Such Incidents may be the result of a weather condition or System fault leading to a wide spread but localized shutdown.

Such Incidents are unpredictable both with respect to timing and the resulting implications. Licensed Distributors shall establish procedures for determining when an Incident on a Distribution System shall be considered a System Incident. The Licensed Distributors shall also establish outline procedures for handling such System Incidents, including but not limited to;

- procedures for determining when an Incident shall be defined as a System Incident;
- defining the responsible officers to manage such Incidents in the various circumstances;
- consider the range of potential Incidents that may fall into this category and outline recovery stages and emergency equipment that may be required;
- ensuring that relevant Persons are adequately trained to respond correctly to such eventualities.

DOC6.7.3 System Incident communications

Licensed Distributors, OETC and all Users will maintain lists of telephone contact numbers at which, or through which, senior management representatives nominated for this purpose and who are fully authorised to make binding decisions on behalf of the relevant User can be contacted day or night.

The lists of telephone contact numbers shall be provided in writing prior to the time that Users Connect to the Distribution System and must be up-dated and circulated to all relevant parties (in writing) whenever the information changes.

Notifications and responses will be made normally by telephone but must be confirmed within 5 minutes by facsimile or other electronic means. The form and any change to the form of confirmation must be agreed in writing with OETC for communications with OETC and with the Licensed Distributor for other parties.

Distribution Operating Code DOC7 – Numbering and Nomenclature

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CONTENTS

Distribution Operating Code DOC7 – Numbering and Nomenclature

DOC7.1 Introduction

Operating Code DOC7 sets out the requirements for the numbering and nomenclature of;

- Licensed Distributors' HV apparatus and Plant on User's Sites; and
- User HV apparatus and Plant on Licensed Distributors' Sites.

DOC7 requires the numbering and nomenclature of Users' HV apparatus and Plant to be distinguishable and different from the numbering and nomenclature of HV apparatus and Plant used by the Licensed Distributors.

DOC7.2 Objective

The objectives of DOC7 are as follows;

- to provide for the application of consistent and distinct numbering and nomenclature of HV apparatus and Plant to ensure that User's apparatus and Plant at a Connection Point cannot be confused with the apparatus and Plant of the Licensed Distributors; and
- to reduce the risk of Incidents and events attributable to human error regarding the identification of HV apparatus and Plant.

DOC7.3 Scope

In addition to Licensed Distributors, DOC7 applies to;

- Embedded Power Producers;
- Users with Systems Connected to the Distribution System;
- OETC;
- Consumers;
- Internally Interconnected Parties Connected to the Distribution System;
- International Interconnected Parties Connected to the Distribution System; and
- RAEC if Connected to a Distribution System.

DOC7.4 Terms

For the purposes of this section of the Distribution Code, the terms;

- **"User Site"** means a site owned (or occupied pursuant to a lease, licence or other agreement) by a User in which there is a Connection Point; and
- **"Licensed Distributor Site"** means a site owned (or occupied pursuant to a lease, licence or other agreement) by a Licensed Distributor in which there is a Connection Point.

DOC7.5 General Requirement

Where throughout this code information is requested in writing, facsimile transmission or other electronic means as agreed with the Licensed Distributors in writing may be used. All writing shall be in the English language.

Each Licensed Distributor shall prepare a Numbering and Nomenclature Policy that shall be used for the numbering and nomenclature of apparatus and Plant at its sites. Copies of the policy will be made available to any User who requests it.

All User's apparatus and or Plant at a Connection Point shall have numbering and nomenclature that is different and distinct from the numbering and nomenclature used by the Licensed Distributor for its HV apparatus and Plant at that Connection Point.

To comply with the requirements of DOC7, Users shall not install, nor permit the installation of any apparatus or Plant with numbering or nomenclature that could reasonably be confused with the numbering and nomenclature of the apparatus or Plant of a Licensed Distributor or any other User at a Connection Point.

DOC7.6 General Procedures

The numbering and nomenclature of each item of HV apparatus and Plant shall be included on the Operation Diagram prepared for each Licensed Distributor Site or Distribution System User Site. The Distribution Connection Conditions requires the preparation of an Operation Diagram for each site. The Operation Diagram shall be updated for any change to the numbering and nomenclature of the apparatus and Plant at the site.

DOC7.6.1 Licensed Distributor HV apparatus and Plant on a User Site

Licensed Distributor HV apparatus and Plant on Distribution System User Sites shall have numbering and nomenclature in accordance with the Licensed Distributor's Numbering and Nomenclature Policy.

When a Licensed Distributor is to install HV apparatus and Plant on a Distribution System User Site, the Licensed Distributor shall notify the relevant Distribution System User of the numbering and nomenclature to be adopted for that HV apparatus and Plant at least three months prior to proposed installation.

The notification will be made in writing to the relevant User and will consist of:

- an Operation Diagram incorporating the Licensed Distributor's new HV apparatus and Plant to be installed;
- the Licensed Distributor's numbering and nomenclature to be adopted for that HV apparatus and Plant; and
- the proposed date of installation of the HV apparatus and Plant.

The relevant Distribution System User will respond in writing to the Licensed Distributor within one month of the receipt of the notification, confirming;

- receipt of the notification;
- that none of the Distribution System User's HV apparatus and Plant at the relevant Distribution System User Site has the same numbering and nomenclature as used by the Licensed Distributor; and

- that if any of the Distribution System User's HV apparatus and Plant at the relevant Distribution System User Site has the same numbering and nomenclature as that used by the Licensed Distributor, the numbering and nomenclature of the Distribution System User's HV apparatus and Plant at the relevant site will be changed before installation of the Licensed Distributor's HV apparatus and Plant at the relevant site.

The relevant Distribution System User shall not install or permit the installation of any HV apparatus and Plant at a site that has numbering or nomenclature that could be confused with the Licensed Distributor's HV apparatus and Plant which is either already on that Distribution System User Site or which the Licensed Distributor has notified to that Distribution System User will be installed on that Distribution System User Site.

DOC7.6.2 User HV apparatus and Plant on the Licensed Distributor's Sites

Distribution System User HV apparatus and Plant on a Licensed Distributor's Sites shall have numbering and nomenclature in accordance with the Licensed Distributor's Numbering and Nomenclature Policy

When a Distribution System User is to install HV apparatus and Plant on a Licensed Distributor's Site, or wishes to replace existing HV apparatus and Plant on a Licensed Distributor's Site or adopt new numbering and nomenclature for such HV apparatus and Plant, the User shall notify the Licensed Distributor in writing at least three months prior to proposed installation and provide;

- an Operation Diagram incorporating the new User HV apparatus and Plant to be installed;
- the details of the HV apparatus and Plant;
- the proposed numbering and nomenclature to be adopted for that HV apparatus and Plant; and
- the proposed date of its installation.

the Licensed Distributor will respond in writing to the User within one month of the receipt of the notification and state;

- whether the Licensed Distributor's accepts the Distribution System User proposed numbering and nomenclature; and
- if the numbering and nomenclature proposed by the Distribution System User are not acceptable, the Licensed Distributor shall give details of the numbering and nomenclature which the Distribution System User shall adopt for the Distribution System User's HV apparatus and Plant.

Distribution System Users will be provided upon request with details of the Licensed Distributor's current Numbering and Nomenclature Policy in order to assist them in planning the numbering and nomenclature for their HV apparatus and Plant at the Licensed Distributor's Sites.

DOC7.6.3 User HV apparatus and Plant on a Distribution System User Site that forms Part of a Licensed Distributor's Installation

Where Distribution System User HV apparatus and Plant, such as circuit breakers, form part of a Licensed Distributor's installation on a Distribution System User Site, the Distribution System User HV apparatus and Plant shall use numbering and nomenclature in accordance with the Licensed Distributor's Numbering and Nomenclature Policy.

DOC7.6.4 Changes to Existing Numbering or Nomenclature

Where a Licensed Distributor has decided that it needs to change the existing numbering or nomenclature of the Licensed Distributor's HV apparatus and Plant on a Distribution System User Site or of Distribution System User HV apparatus and Plant on the Licensed Distributor's Site;

- For the Licensed Distributor's HV apparatus and Plant on a Distribution System User Site, the provisions of the Licensed Distributor's Numbering and Nomenclature Policy shall apply to such changes of numbering or nomenclature with any necessary amendments to those provisions to reflect that a change is being made;
- For Distribution System User HV apparatus and Plant on a Licensed Distributor's Site, the Licensed Distributor will notify the Distribution System User of the numbering and nomenclature that the User shall adopt for that HV apparatus and Plant at least three months prior to the change being needed and the Distribution System User will respond in writing to the Licensed Distributor within one month of the receipt of the notification, confirming receipt and acceptance of the changes; and
- If the Distribution System User objects to the changes proposed by the Licensed Distributor;
    - the Licensed Distributor and the Distribution System User shall consult promptly to reach agreement;
    - if agreement cannot be reached, the Licensed Distributor's Numbering and Nomenclature Policy will be used; and
    - if the disagreement concerns a point of principle, the Distribution System User may set out the arguments and present them to the Distribution Code Review Panel for its consideration. The Licensed Distributor's Numbering and Nomenclature Policy will apply until the disagreement is resolved.

In all cases a Licensed Distributor's notification shall indicate the reason for the proposed change to the existing numbering or nomenclature.

DOC7.6.5 Labelling

All HV apparatus and Plant shall be provided with clear and unambiguous labelling showing the numbering and nomenclature.

Licensed Distributors and Distribution System Users are each responsible for the provision and erection of labelling on their own HV apparatus and Plant.

Where there is a requirement for the numbering and nomenclature of HV apparatus and Plant to be changed, Licensed Distributors and Distribution System Users shall each be responsible for providing and erecting the labels on their own apparatus and Plant by the required date.

Distribution Operating Code DOC8 – System Tests

Issued 5 Nov 2019

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Distribution Operating Code DOC8 – System Tests

DOC8.1 Introduction

Operating Code DOC8 sets out the authorisation required and the procedures to be followed by Licensed Distributors and Users wishing to conduct Operational Tests or Site Investigations involving apparatus and Plant that is Connected to or part of the Distribution System.

DOC8 stipulates that prior authorisation is required from a Licensed Distributor before conducting Operational Tests or Site Investigations.

DOC8.2 Objective

The objectives of DOC8 are to ensure that Operational Tests and Site Investigations;

- are authorised by a Licensed Distributor and are carried out in accordance with appropriate procedures;
- are carried out in a coordinated manner to avoid unnecessary risk or damage to apparatus and Plant and to minimise costs to Licensed Distributors, OETC, PWP and affected Users;
- do not threaten the safety of Persons or the general public;
- do not threaten the security or stability of the Distribution Systems or the Transmission System; and
- are properly evaluated on completion and, where appropriate, subject to certain reporting arrangements.

DOC8.3 Scope

In addition to Licensed Distributors, DOC8 applies to;

- all Embedded Power Producers;
- OETC;
- PWP;
- Consumers Connected to the Distribution Network where a Licensed Distributor considers it necessary;
- Licensed Suppliers;
- Internally Interconnected Parties Connected to the Distribution Network;
- International Interconnected Parties Connected to the Distribution Network; and
- RAEC if Connected to the Distribution System.

DOC8.4 Terms

For the purposes of DOC8, the terms;

"Site Investigation Tests" are tests conducted in relation to apparatus and Plant and operational procedures at Embedded Gensets and User sites or to monitor and assess the characteristics of apparatus and Plant;

"Test Document" means the document prepared by the Test Panel setting out all aspects for the management and implementation of a test;

"Test Panel" means a panel established to prepare a detailed programme for the conduct of an Operational Test or Site Investigation and to prepare a formal Test Document; and

"Test Request" means a document setting out the detailed proposal for an Operational Test or Site Investigation.

DOC8.5 Categories of Tests

DOC8 applies to the following categories of tests;

Operational Tests:

- required by a Licensed Distributor;
- requested by a User; and
- requested by PWP or a Power Producer to commission or test the compliance of Embedded Gensets with the requirements of a PPA or PWPA.

Site Investigation Tests:

- in relation to apparatus and Plant and operational procedures at Embedded Gensets and User sites; and
- to monitor and assess the characteristics of apparatus and Plant for which a User is required to provide or has contracted to provide certain Ancillary Services.

Other Tests:

- required, in certain circumstances, (whether by means of a formal test or verification by inspection) to ascertain whether Connection Conditions and Connection Agreements are being complied with in respect of Gensets and User's equipment; and
- required, in certain circumstances, at the request of a User.

DOC8.6 Authorisation and Test Procedures

DOC8.6.1 Test Requests

Prior authorisation from Licensed Distributors is required before conducting an Operational Test or Site Investigation that may affect the Distribution System.

PWP or Users seeking to conduct an Operational Test or Site Investigation shall submit a Test Request to the Licensed Distributor giving at least 8 weeks minimum notice before the date of the proposed test. A Test Request shall include a detailed test proposal including;

- a brief description of the proposed test;
- the preferred time or times for the test and the potential duration;
- the reason for the proposed test indicating whether the test is required for compliance with licence conditions, statutory regulations, or safety rules. This will assist in determining the priority to be given to the test;
- an indication of whether there are any adverse effects if the test is cancelled at short notice or delayed (reasonable detail of such adverse effects to be provided);
- an indication of any Dispatch Instructions required to facilitate the test; and
- details of any operational switching required to facilitate to test.

Each Licensed Distributor shall evaluate all Test Requests submitted to it and consult with OETC if any Dispatch Instructions are required to facilitate the test or if the Licensed Distributor considers that the test may affect the Transmission System.

On receipt of a Test Request a Licensed Distributor shall within 2 weeks either;

- approve the Test Request;
- request any additional information from the test proposer required to evaluate the impact of the Test Request; or
- reject the Test Request application.

Licensed Distributors shall consider the following factors when evaluating a Test Request;

- the impact of the requested test on Distribution System stability and security;
- the impact of the requested test on the Transmission System as indicated by OETC, including whether or not the Grid Code has been complied with;
- the impact of the requested test on other Users; and
- the effect of the requested test on the continuity and quality of electricity Supply.

If a Licensed Distributor approves a Test Request, it will inform the test proposer accordingly.

If a Licensed Distributor requests (or OETC requires) additional information from the test proposer to evaluate the impact of a Test Request the Licensed Distributor shall stipulate the time within which the information shall be provided. If the information is not provided in the timescale indicated by the Licensed Distributor the Test Request shall automatically lapse.

If a Licensed Distributor does not approve a Test Request, it will set down its reasons in writing for rejecting a Test Request application and consult with the test proposer on any changes to the test proposal required to secure approval for the test. The test proposer may update a test proposal in accordance with guidance provided by the Licensed Distributor and submit a revised Test Request.

Licensed Distributors shall not withhold approval of a Test Request unless it considers it has reasonable grounds for doing so. If a User is not satisfied that a Test Request was rejected on reasonable grounds it can refer the matter to the Regulatory Authority for determination.

Licensed Distributors shall not disclose except to OETC for the purposes of evaluating the test proposal, any information received as part of a Test Request application without the consent of the User who submitted the Test Request if it reasonably believes the information to be commercially sensitive or otherwise potentially sensitive.

DOC8.6.2 Test Panel

If a Test Request is approved, the Licensed Distributor shall decide if a Test Panel is required. If the Licensed Distributor decides that a Test Panel is required, the test proposer shall convene a Test Panel. The number of Test Panel members shall be kept to the minimum number of Persons compatible with representation of affected User.

The Chairman of a Test Panel shall be appointed by the test proposer. As regards other representation;

- the Licensed Distributor shall have a representative on all Test Panels;
- PWP shall have a representative on all Test Panels that are concerned with tests arising from a PPA or PWPA; and
- all directly affected Users including OETC shall be represented on the Test Panel.

The duties and responsibilities of the Test Panel are as follows;

- to prepare a detailed programme for the conduct of the test, including the start and end date of the test, and any Dispatch requirements and operational switching required to facilitate the test;
- to identify the detailed management requirements of the test;
- to ensure that all affected parties are properly informed of and have access to all relevant information;
- to schedule the resources required to conduct the test; and
- to prepare a Test Document that shall include all the elements listed above.

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

The test shall proceed only on the condition that the Test Panel has approved the Test Document. If a member of the Test Panel is not satisfied with the test proceeding and they have fully discussed the issues within the Test Panel, they may make representations to the Regulatory Authority.

No party shall disclose information provided to a Test Panel without the consent of the Person who submitted the information if it reasonably believes the information to be commercially sensitive or otherwise potentially sensitive.

DOC8.6.3 Post Test Reporting Requirements

At the conclusion of an Operational Test or Site Investigation the test proposer shall prepare a written report on the test that shall be available within 4 weeks of the conclusion of the Operational Test or Site Investigation. The report shall be copied to the Licensed Distributor and the Regulatory Authority in all cases and to the PWP where a Power Producer conducted the test.

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

The Test Report shall include a detailed description of the completed test, the apparatus and Plant to which the test relates, together with the results, conclusions and recommendations as they relate to the test proposer, the Licensed Distributor and operationally affected Users, where applicable.

DOC8.7 Operational Tests

Licensed Distributors shall cooperate with the implementation of all relevant Operational Tests.

Where a Licensed Distributor considers the impact of an Operational Test to be significantly greater than originally estimated, the Licensed Distributor may at any time contact the test proposer to discuss a revised test procedure or schedule. The Licensed Distributor shall, where it considers it necessary to do so, cancel, interrupt, or postpone an Operational Test at any time.

If the test proposer wishes to cancel an Operational Test before commencement of the test or during the test, the test proposer must notify the Licensed Distributor immediately and the notice must be confirmed in writing within 1 hour by facsimile or other electronic means

DOC8.7.1 Operational Tests Required by a Licensed Distributor

Each Licensed Distributor, as operator of the Distribution System, may from time to time need to conduct Operational Tests in order to maintain and develop operational procedures, to train staff, and to acquire information in respect of Distribution System behaviour under abnormal System conditions.

Licensed Distributors will endeavour to keep the frequency of occurrence, scope, and impact of Operational Tests to the minimum necessary.

Where a Licensed Distributor intends to carry out an Operational Test and in the Licensed Distributor's reasonable opinion, such a test will or may have an Operational Effect on other Users or their Systems including OETC, the Licensed Distributor shall give 8 weeks notice and provide sufficient information to the affected Users to enable the affected Users to assess any risks to their Systems. The information provided by the Licensed Distributor shall include;

- a brief description of the Operational Test;
- the probable effects of the Operational Test; and
- the scheduled time and duration of the Operational Test.

Affected Users may contact the Licensed Distributor to request additional time or information to consider the impact of the Operational Test on their Systems and shall respond to the Licensed Distributor within 2 weeks of receipt of the Licensed Distributor's notice of the test.

DOC8.7.2 Operational Tests Required by Users

Operation of User's Plant in accordance with Good Industry Practice requires testing to maintain and develop operational procedures, develop and measure Plant performance, comply with statutory or other industry obligations and contracts, and to train staff.

Each User shall endeavour to limit the frequency of occurrence of Operational Tests and to limit the effects of such Operational Tests on the Distribution System.

Users shall submit a Test Request to the Licensed Distributor in accordance with the requirements of DOC 8.5.1.

DOC8.7.3 Operational Tests at Production Facilities

Where a Power Producer with Embedded Gensets or PWP requires that tests are undertaken at such a Production Facility, PWP or the User shall submit a Test Request to a Licensed Distributor in accordance with the requirements of DOC 8.5.1. The Licensed Distributor shall consult with OETC on all such tests. Following agreement of the test Document, OETC will incorporate any requirements identified in the Operational Test proposal within the programming phase of Operational Planning OC2 and in accordance with the Scheduling and Dispatch Codes SDC1 and SDC2 of the Grid Code. The Licensed Distributor will incorporate any relevant requirements identified in the Test Document within the programming phase of DOC2

Where an Operational Test requires a Dispatch Instruction that is outside the currently declared Operating Parameters, then OETC may so Dispatch the Genset for the period required for the Operational Test.

However, OETC shall contact the Power Producer 2 days before the test date and review the Dispatch Instructions contained in the Test Document. The Power Producer shall confirm its acceptance or rejection of the proposed Dispatch Instructions without undue delay.

On notification of rejection of the proposed Dispatch Instructions, the Power Producer may enter into discussions with OETC as to an alternative schedule for the Operational Test, or may request a different Operational Test or may request the Operational Test at an alternative time. OETC shall keep the Licensed Distributor informed at all stages of the such discussions, by telephone if necessary but always confirmed by agreed electronic media.

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

The Operational Test shall proceed in accordance with normal operational practices but with particularly close communication between the OETC control engineer, the Licensed Distributor control engineer and the test manager.

DOC8.8 Site Investigation Tests

A Licensed Distributor may, if it reasonably considers that there may be an issue of non-compliance with an agreement by the User, carry out an Investigation to acquire or verify information relevant to Users' Plant and/or apparatus design, Operation or Connection requirements under the Distribution Code, Connection Agreements and other Agreements between Users and the Licensed Distributor.

A Licensed Distributor may, having given reasonable notice, send a representative or agent to a User's site in order to investigate any equipment or operational procedure applicable to the User site insofar as the condition of that equipment or operational procedure is relevant to compliance with the Distribution Code, a Connection Agreement, or other relevant agreements.

Distribution Code

Issued 5 Nov 2019

Glossary and Abbreviations

A	Ampere
AC	Alternating current
AVR	Automatic Voltage Regulation
CCGT	Combined Cycle Gas Turbine
CD	Centrally Dispatched
CT	Current Transformer
DOC	Distribution Operating Code
DSM	Demand Side Management
ECA/ECUOSA	Electrical Connection Agreement or Electrical Connection and Use of System Agreement
G	Giga or 10^9
GC	General Conditions
GWh	Giga Watt Hour
HV	High Voltage
Hz	Hertz
IEC	International Electro-technical Commission
ITU	International Telecommunications Union
k	Kilo or 10^3
kV	Kilo-Volt
LV	Low Voltage
M	Mega or 10^6
MHEW	Ministry of Housing, Electricity and Water, Sultanate of Oman
ms	milli second
MVA	Mega-Volt-Ampere
Mvar	Mega-Volt-Ampere Reactive / Mega-var (Reactive Power)
Mvarh	Mega-var- hour (Reactive Energy)
MW	Mega-Watt (Active Power)
MWh	Mega-Watt-hour (Active Energy)
PPA	Power Purchase Agreement

PWP	Oman Power and Water Procurement Company SAOC
PWPA	Power and Water Purchase Agreement
RAEC	Rural Areas Electricity Company SAOC
SCADA	Supervisory Control and Data Acquisition
SDC	Scheduling and Dispatch Code
VA	Volt-Ampere
VT	Voltage Transformer

Definitions

The following definitions identify the meanings of words used in the Distribution Code. Plurals of the words and variations of tense are deemed to have similar meanings.

Active Energy

The electrical energy produced during a time interval measured in units of watt-hours or standard multiples thereof. Where the term **Energy** is used without any modifier, this will have the same meaning;

Active Power

The product of voltage and the in-phase component of alternating current measured in units of watts or multiples thereof. When the term **Power** is used without any modifier, this will have the same meaning;

Actual Metering Point

The physical point at which electricity is metered;

Alert

A warning issued by OETC under the Grid Code to inform Users of potential Emergency Conditions on the System;

Ancillary Services

Services which (1) Licensed Generators, Licensed Generators/Desalinators or other Persons Connected to a Transmission System or Distribution System may be required to provide from time to time in connection with the security and stability of the Total System; and (2) are provided for in either (i) an agreement between a Licensed Transmission System Operator or a Licensed Distribution System Operator and any Person or (ii) an agreement between a licensed generator or a licensed generator/desalinator and the PWP;

Autogenerator

A Person that Generates electricity primarily for the purposes of self-supply;

Automatic Under-Frequency Relays

Frequency relays used for the automatic de-energising of feeders Connecting Consumers at preset Frequencies to assist stabilising the Active Power balance between Demand and Available Generation;

Automatic Voltage Regulation (AVR)

A continuously acting automatic excitation system to control Genset terminal voltage;

Availability

The MW Capacity of a Centrally Dispatched Genset declared available to OETC and/or PWP by a Power Producer and **Available** shall be construed accordingly;

Black Start

The procedure necessary for the recovery from a Partial System Shutdown or a Total System Shutdown;

Business Day

A day on which banks in Oman are open for business purposes;

Capacity

The capacity of any Plant to produce, deliver or receive electricity, as the case may be, stated in MW at an assumed or agreed Power Factor or in MVA;

Caution Notice

A notice issued in accordance with Safety Rules approved by a Licensed Distributor and placed at a point of adequate physical separation which must be in accordance with, and maintained in accordance with Safety Rules to allow safe working;

CCGT Module

A group of Gensets, comprising one or more Gas Turbine Gensets (or other gas based engine set) and one or more Steam Turbine Gensets where, under normal Operation, the waste heat from the gas turbines, is used to drive the steam turbine(s) and the component sets within the CCGT Module are designed to Operate together for increased efficiency and are registered as a CCGT Module under this Code;

CDGenset (Centrally Dispatched Genset)

A Generating Set with a Registered Capacity in excess of 5 MW and which is subject to the procedure of Central Dispatch;

Central Dispatch (CD)

The process of scheduling and issuing Dispatch Instructions by OETC;

Code Notices

A notice served under or for the purposes of the Distribution Code;

Completion Date

Has the meaning set out in the Connection Agreement with each User, or in the absence of a definition, it shall mean the date when a User is expected to Connect to or start using the Distribution System;

Complex

One or more Connection Sites together with any associated Production Facility and/or Distribution substation and/or associated Plant and/or apparatus, as appropriate;

Connection

In relation to any Plant, Premises or System, the presence of a physical Connection between those Plant, Premises or System and a Transmission System or a Distribution System other than one owned or Operated by the RAEC and **Connect** and **Connected** shall be construed accordingly;

Connection Offer

The terms and conditions offered by a Licensed Distributor to a User for Connection of a User's System to the Licensed Distributor's System;

Connection Point

The point on a Distribution System to which a User's plant, Premises or System is Connected to the Distribution System of a Licensed Distributor;

Connection Site

The physical site belonging to a Licensed Distributor or a User where a Connection Point is located;

Consumer

A Person who is Supplied with electricity at Premises for consumption at those Premises;

Control Centre

The centre within an entity from where Scheduling, Dispatch and Operational Instructions are given to other control rooms or Plant operators. The term is used to any such centre which may be a fully fitted control centre, an operational room or a Person designated with such responsibilities;

Control Phase

24hrs ahead to real time Operation;

Daily Status Form

The form used by Power Producers for submission of data to OETC and PWP under Grid Code SDC1;

Demand

The demand for Active and/or Reactive Power;

Demand Control

Any method of achieving a controlled reduction or increase in Demand;

Demand Control Imminent Warning

A warning that may be issued within the following 30 minutes, relating to a Demand reduction which will be issued by OETC to Licensed Distributors and to Power Producers at Production Facilities and to directly Connected Consumers;

Demand Side Management

The controlled reduction in Demand achieved in real time by a User;

Desalination

The production of demineralised or potable water by desalination and **Desalinated** shall be construed accordingly;

Desalination Unit

A unit forming part of the Production Facility and which is capable of producing Desalinated water;

Designated Operator

The operator approved in writing by the relevant User as competent to carry out the procedures in agreed Operational Instructions;

Dispatch

The general process by which instructions are determined and the issuing of those instructions, **Dispatch Instructions**, to (1) Power Producers as to the Operation or cessation of Operation of their Production Facilities and (2) other Persons whose facilities are Connected;

Distribution

Means, in relation to electricity, the transport of electricity by means of a Distribution System and **Distribute** shall be construed accordingly;

Distribution Code Review Panel

The Panel with the functions set out in GC.4 of the General Conditions of the Distribution Code;

Distribution System

A System which: (i) is not a Transmission System; (ii) is used to transport electricity; (iii) consists (wholly or mainly) Electric Lines and Electric Plant (namely, Electric Lines and Electric Plant with voltage levels of less than a nominal 132kV) and (iv) which is used wholly or mainly for the transport of electricity to Premises;

Distribution System User

Any Person party to an agreement to connect to and/or use the Distribution System of a Licensed Distributor;

Disturbance

Any sudden significant change to the Total System caused by a sudden loss of a Generating Set, or the interruption of Demand, or the failure of Plant;

Earthing Device

A means of providing a Connection between a conductor and the general mass of earth, being adequate to allow the flow of the maximum prospective earth fault current, at that point on the Total System;

Electric Lines

Any line, whether underground or overground, which is used for carrying electricity for any purpose and includes, unless the context otherwise requires:

(a) any support for any such line, including, without limitation, any structure, pole, pylon or other thing in, on, by or from which any such line is or may be supported, carried or suspended;

(b) any apparatus Connected to any such line for the purpose of carrying electricity; and

(c) any wire, cable, tube, pipe or other similar thing (including its casing, insulator or coating) which surrounds or supports, or is surrounded or supported by, or is installed in close proximity to, or is supported, carried or suspended, in association with, any such line;

Electric Plant

Any plant, equipment, apparatus or appliance used for, or for purposes Connected with, the Generation, Transmission, Dispatch, Distribution or Supply of electricity, other than:

(a) an Electric Line;

(b) a meter used for ascertaining the quantity of electricity supplied to any Premises; and

(c) an electrical appliance under the control of a Consumer;

and **Plant** shall be construed accordingly;

Electrical Connection Agreement

An agreement between a User and a Licensed Distributor for the Connection of the User's System to the Distribution System of a Licensed Distributor;

Electrical Connection and Use of System Agreement

An agreement between a Licensed Distributor and a System User to provide principally for (i) the Connection of System User's apparatus to the Distribution System; (ii) the calculation of charges for use of System; and (iii) to record the mechanism relating to the payment of Connection Fees;

Electrical Delivery Point

The point located at the Connection Point at which the User System Connects to the Distribution System of a Licensed Distributor and at which electrical Energy is delivered and by reference to which the electrical Energy is measured;

Embedded Genset

Generating Sets that are Connected to a Distribution System or the System of any other User, such Connection being either a direct Connection or a Connection via the busbar of another User but with no direct Connection to the Transmission System, where;

- Large Embedded Gensets are deemed to be those with a Registered Capacity of greater than 5MW; and
- Small Embedded Gensets are deemed to be those with Registered Capacity of less than or equal to 5MW;

Embedded Power Producer

A User Operating an Embedded Genset;

Emergency Conditions

Abnormal System conditions that require automatic or rapid manual action to prevent or limit loss of Transmission facilities, Distribution facilities or Generation Capacity that could adversely affect the reliability of the Total System;

Emergency Instructions

A Dispatch Instruction issued by OETC that may require an action or response that is outside the limits implied by a Daily Status Form submitted by a CDGenset or instructions issued by OETC to prevent or limit abnormal System conditions;

Emergency Manual Demand Shedding

The manual de-energisation of Consumers or Electric Lines feeding Consumers in Emergency Conditions to assist regaining the Active Power balance between Available Generation Capacity and Demand;

Expert

A Person with appropriate educational and practical experience to provide relevant advice to the subject in question and who should have no direct involvement with any of the parties;

Forced Outage

An Outage for which no timely notice can be provided by the User to OETC or a Licensed Distributor;

Frequency

The number of alternating current cycles per second (expressed in Hertz) at which a Total System is running;

Gas Turbine Genset

A Genset with a gas turbine as its prime mover;

Generating Set (Genset)

Any apparatus which produces electricity (including a (single) Genset and its associated prime mover, within a CCGT Module);

Generation

Means the production of electricity by any means and **"Generate"** and **"Generated"** shall be construed accordingly;

Generator Performance Chart

A diagram which shows the MW and Mvar capability limits within which a Generating Set will be expected to Operate under steady state conditions;

Good Industry Practice

Acting in good faith to perform obligations in accordance with the requirements of the Sector Law and international good practice in the electricity and desalination industries;

Government

The Government of the Sultanate of Oman;

Grid Code

Means the Grid Code prepared pursuant to Condition 3 of OETC's Transmission Licence;

High Voltage (HV)

A nominal alternating voltage equal to or exceeding one kilovolt;

Incident

An unscheduled or unplanned occurrence on, or relating to, a System (including Embedded CDGensets) including, faults, events and breakdowns and adverse weather conditions being experienced;

Interconnection Agreement

An agreement made between OETC, a Licensed Distributor or RAEC and a Person external to the Sultanate of Oman, relating to the transfer of Power and or Active Energy/Reactive Energy and or Ancillary Services across an Interconnector;

Interconnector

Means facilities that Connect two Systems;

Internal Interconnection

A Connection that facilitates the transfer of electricity to or from OETC's Transmission System, a Distribution System of a Licensed Distributor or a User System located within Oman. A single Internal Interconnection may comprise several circuits Operating in parallel;

Internally Interconnected Party

A Licensed Person located in Oman that owns and/or Operates a Transmission System, a Licensed Distribution System and/or Plant for the purpose of providing Energy to other Users and Consumers and/or Ancillary Services;

International Interconnected Party

A Person responsible for the Operation of an electrical Transmission System or Distribution System outside the Sultanate of Oman that is Connected to a System that exists within Oman;

International Interconnection

A Connection between a System that exists within Oman and a System that exists outside Oman;

Islanded

Following a Total System Disturbance, a situation in which parts of the System with its Connected Production Facilities become detached from the rest of the Total System;

Isolating Device

A device used for achieving electrical isolation;

Isolation

The disconnection of HV apparatus from the remainder of the System in which that HV apparatus formed part;

Licence

An authorisation to undertake a Regulated Activity issued by the Regulatory Authority pursuant to the Sector Law;

Licensed Distribution System Operator

A Person who is the holder for the time being of a Distribution Licence and **Licensed Distributor** shall be construed accordingly;

Licensed Supplier

Any Person that holds a Supply Licence;

Load

The Active or Reactive Power, as the context requires, Generated, Transmitted or Distributed;

Low Voltage or LV

An alternating voltage less than one kilovolt;

Main Protection

Protection equipment or system expected to have priority in initiating fault clearance or an action to alleviate an abnormal condition on the Total System;

Maximum Generation (Max Gen)

The maximum stable sent out Power (in MW) that a Production Facility could make available under Emergency Conditions;

Member

A Person who is a Member of the Distribution Code Review Panel;

Merit Order

An order for ranking available Production Facilities which order: (1) shall have as its aim the optimising of combined Total System and Desalinated water Production Capacity economy, security, stability and reliability; (2) shall give due consideration to incremental power purchase costs, incremental Transmission losses, Total System technical constraints and other technical and operational considerations; and (3) shall otherwise be determined by OETC and each other Licensed Transmission System Operator in accordance with its Transmission Licence in relation to Production Facilities Connected to its System;

Meter

A device for measuring and recording units of Active Power, Active Energy, Reactive Power or Reactive Energy or other electrical quantities;

Minimum Generation (Min Gen)

The minimum stable output Power, in MW, which a CDGenset has registered through the Planning Code and/or the Scheduling and Dispatch Code, with OETC;

Numbering and Nomenclature Policy

The policy document of OETC or a Licensed Distributor setting out a consistent and distinct numbering and nomenclature system of HV apparatus and Plant;

Oman Electrical Standards (OES)

Standards and regulations in relation to safety of equipment and electrical Systems and procedures associated with the specification and Operation of electrical Systems, formerly issued by the Ministry of Housing Electricity and Water, and known as Oman Electrical Standards. Such standards may from time to time be reviewed, modified or replaced pursuant to the Sector Law and including any such new standards as may be established, reviewed or modified from time to time pursuant to the Sector Law;

Oman Power and Water Procurement Company SAOC (PWP)

The Person of this name performing the functions assigned to it under the Sector Law;

Operating Parameters

The technical capabilities, flexibilities and limitations of a Genset, taking into account changes due to Site Rating, registered in the Grid Code, OC2 and notified under the Scheduling and Dispatch Code of the Grid Code through the Daily Status Form, as amended in accordance with the Grid Codes;

Operation

A planned, scheduled or erroneous action relating to the Operation of part of the Total System and **Operate** will be construed accordingly;

Operation Diagram

A diagram that is a schematic representation of the HV Plant and the Connections to all external circuits and a Connection Site, incorporating its numbering, nomenclature and labelling;

Operational Effect

Any effect on the Operation of another System that causes the Distribution System of a Licensed Distributor or a User's System to Operate (or be materially at increased risk of Operating) differently to the way in which they would or may have normally Operated in the absence of that effect;

Operational Instructions

Instructions and procedures issued in connection with the actual Operation of Plant and/or apparatus;

Operational Log

A chronological record of messages relating to Operational Instructions and safety coordination sent and received by each Safety Coordinator under DOC4 of the Distribution Code;

Operational Planning Phase

For the purposes of the Distribution Code, the period from 6 weeks to the end of the 3rd year ahead of real time Operation;

Operational Test

A test carried out in order to acquire information in respect of Plant and apparatus under pre-determined System conditions;

Operational Year

The year running 1 April to 31 March where Operational Year 0 means the current Operational Year, Operational Year 1 means the following Operational Year, etc.;

Outage

In relation to a Genset or Desalination Unit, an event, which affects a Power Producer's ability to make Capacity Available. In relation to OETC, or a Licensed Distributor, the removal of any part of the Transmission or Distribution Systems for repair or maintenance, or as a result of failure or breakdown;

Partial System Shutdown

As for a Total System Shutdown except that all Generation has ceased in a part of the Total System that has become detached from other parts of the Total System and there is no electricity Supply from other parts of the Total System, so it is necessary to invoke Black Start procedures;

Person

An individual, partnership, company, firm, trust, body corporate, government, government body, authority, emanation, agency, instrumentality, unincorporated body or an association;

Planned Outage

An Outage planned at least seven days in advance of the event;

Planned Rota Demand Shedding

The manual de-energisation and re-energisation according to planned rotas of Consumers or Electric Lines feeding Consumers in Emergency Conditions to maintain the Active Power balance between Available Generation and Demand;

Power Factor

The cosine of the phase angle between the Volt-Amperes and the Active Power component;

Power Producer

Any Person that Generates electricity and/or which Operates one or more Genset(s), which Connect to the Transmission System, or Distribution System and Operate Synchronously with that Transmission System or Distribution System. This includes a Power Producer that Operates a Desalination Unit;

Power Purchase Agreement (PPA)

The contract between a Power Producer and the PWP in respect of Power and/or Energy, and/or other services purchased from a Power Producer in respect of a Production Facility;

Power and Water Purchase Agreement (PWPA)

An agreement entered into by PWP and a Licensed Generator/Desalinator pursuant to which the PWP agrees, amongst other things, to purchase the Production Capacity and Output associated with the relevant Production Facilities;

Premises

Any land, building or structure occupied or used by a Person;

Production Facility

Plant which is used for the Generation of electricity or the combined Generation of electricity and Desalination of water and includes, as applicable, all associated Electric Lines, Electric Plant and water equipment;

Programming Phase

Within the Distribution Code, the period from 6 weeks down to 24 hours ahead of real time Operation;

Protection

The provision for the detection of fault conditions on the Total System and the automatic or manual initiation of fault clearance action, including audible and visual alarms, indications and data logging;

Reactive Compensation Plant

Reactors and capacitors Connected to the System to compensate in part for excesses of Reactive Power;

Reactive Energy

The integral with respect to Reactive Power, measured in units of voltampere reactive hours (Varh) and standard multiples thereof;

Reactive Power

The product of alternating voltage and current and the sine of the phase angle between them measured in units of voltamperes reactive (vars) and standard multiples thereof;

Reactive Power Generation or output is an export onto the System and is referred to as "lagging Reactive Power or lagging Mvar", and Reactive Power absorption is an import from the System and is referred to as "leading Reactive Power or leading Mvar";

Red Warning

A warning that will be issued by OETC by 16:00 hours on the day ahead to those Licensed Distributors and directly Connected Customers who will or may subsequently receive instructions under the Grid Code OC4;

Registered Capacity

In relation to a Genset that does not form part of a CCGT Module, the normal full Capacity of that Genset taking into account changes due to Site Rating as registered with OETC or a Licensed Distributor and, as amended from time to time in accordance with the Grid Code or Distribution Code. In the case of a CCGT Module, the normal full capacity of the CCGT Module taking into account changes due to Site Rating, as declared by the Power Producer and amended from time to time in accordance with the Grid Code or Distribution Code;

Regulatory Authority

The body established pursuant to Article [(38)] of the Sector Law

Rural Areas Electricity Company SAOC (RAEC)

The Company of that name established pursuant to Article (6) of the Sector Law;

Safety Coordinator

A Person nominated by a User to be responsible for the coordination of Safety Precautions at a Connection Point when work which includes testing is to be carried out on a System which necessitates the provision of Safety Precautions on HV apparatus;

Safety Earthing

The Connection to the general mass of earth of HV conductors by an Earthing Device in accordance with DOC7;

Safety From The System

The condition that safeguards Persons when work is to be carried out on a System from the dangers that are inherent in the System;

Safety Permits

Safety documents issued under the Safety Rules relating to safe conditions for working on Plant and apparatus;

Safety Precautions

The Isolation and or Earthing of HV apparatus, posting of safety tags, use of safety equipment and other measures to ensure safety;

Safety Rules

The rules of a Licensed Distributor or a User that establish a safe system of working on HV Plant and /or apparatus;

Sector Law

The Law Governing the Privatisation and Regulation of the Electricity Sector, Sultani Decree No. [/2003];

Significant Incident

An Incident that a Licensed Distributor has determined as significant in the context of reporting in DOC4;

Site Common Drawings

Drawings prepared for each Connection Site which incorporate Connection Site layout drawings, electrical layout drawings, common protection/control drawings and common services drawings;

Site Investigations

Tests conducted in relation to apparatus and Plant and operational procedures at Production Facilities and User sites or to monitor and assess the characteristics of apparatus and Plant;

Site Responsibility Schedule

A schedule forming part of the Connection Agreement containing the information and prepared in accordance with the Connection Code;

Standard Planning Data

The general data required by a Licensed Distributor under the Planning Code;

Steam Turbine Genset

A Genset with a steam turbine as its prime mover;

Summer Period

The period commencing 00:00 on 1 April in a Gregorian Calendar Year and ending at 24:00 on 30 September in the same Gregorian Calendar Year

Supply

In relation to electricity, the Supply of electricity to any Premises and **Supplied** and **Supplies** shall be construed accordingly;

Synchronised (Synchronise)

The condition where a Generating Set, or a System, is Connected to the busbars of another System or Total System, so that the Frequencies and phase relationships of that Generating Set or System are identical (within operational tolerances) to those of the other System or Total System and **Synchronise** and **Synchronisation** will be construed accordingly;

System

A Distribution System or a Transmission System, as the context requires;

System Normalisation Procedures

The procedures necessary for a recovery from a Partial System Shutdown or Total System Shutdown;

System Separation

A situation where following an Incident parts of the Transmission System or Distribution Systems are out of Synchronism with each other,

Target Frequency

That Frequency determined by OETC as the desired operating Frequency of the Total System. This will normally be 50.00 Hz plus or minus 0.02Hz except in exceptional circumstances determined by OETC;

Three-Year Capability Statement

A statement, prepared by a Licensed Distributor, in accordance with the terms of the Distribution and Supply Licence showing for each of the 3 succeeding Operational Years, the forecast Demands and Power flows on the Distribution System;

Total System

The situation when all Generation Connected to the Total System has ceased and the Total System has ceased to function;

Total System Shutdown

The situation when all Generation Connected to the Total System has ceased and the Total System has ceased to function;

OETC

The Oman Transmission Company SAOC established pursuant to the Sector Law;

Transmission

Means, in relation to electricity, the transport of electricity by means of a Transmission System, and **Transmit** shall be construed accordingly;

Transmission System

A System for the transport of electricity, which System consists (wholly or mainly) of high voltage Electric Lines and Electric Plant (namely, Electric Lines and Electric Plant with a nominal voltage equal to or greater than 132kV) and which is used for transporting electricity from a Production Facility to a sub-station, from one Production Facility to another, from one sub-station to another or to or from any Interconnector, Premises, or Distribution System and any Electric Plant used for the purposes of Dispatch;

User

A Person using the Distribution System of a Licensed Distributor, including all Power Producers having CDGensets, all Internally Interconnected Parties and International Interconnected Parties Connected to the Distribution System of a Licensed Distributor, Licensed Distributors and all Consumers Connected to the Distribution System of a Licensed Distributor. In some instances, this term means any Person to whom the Distribution Code applies; and

Winter Period

The period commencing 00:00 on 1 October in a Gregorian Calendar Year and ending at 24:00 on 31 March in the following Gregorian Calendar Year.