Distribution Code
Part 1: General Requirements

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Distribution Code – Part 1: General Requirements

1.0 Introduction

This document summarises the requirements which must be complied with by anyone connecting their equipment to the Counties Power Network distribution system and also provides guidance on how we manage our electricity network.

It is relevant to all stakeholders including electricity retailers, electricity users, generators connected to the Counties Power Network, developers, contractors, consultants and shareholders.

This code comprises six parts, all of which are available from Counties Power's website www.countiespower.com, each covering a specific set of requirements

Part 1: General Requirements (this document)

Part 2: Network Connection Standard

Part 3: Metering Requirements for Electrical Installations

Part 4: Distributed Generation Requirements

Part 5: Technical Interference Requirements

Part 6: Distribution Operation Code

Definitions of terms and abbreviations are found in section 14.1 of Part 1 (this document) of the code.

Reference should also be made to Counties Power's document "Network Demarcation Standard" which identifies the demarcation of interconnection points on the Counties Power network and individual consumers connected to the network. It clarifies the ownership and maintenance responsibilities for Low Voltage (LV) and High Voltage (HV) distribution network on private property.

COUNTIESPOWER

Distribution Code – Part 1: General Requirements

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2.0 Scope

This document, the Distribution Code, sets out the terms and conditions which must be complied with by anyone connecting their equipment to the Counties Power distribution system. There are five associated documents under this code which provide specific details on technical and associated matters as follows: -

Part 2: Network Connection Standard

Part 3: Metering Requirements for Electrical Installations

Part 4: Distributed Generation Requirements

Part 5: Technical Interference Requirements

Part 6: Distribution Operational Code

These may be downloaded from the Counties Power website.

In addition to complying with the Distribution Code, network operators will be bound to comply with existing legislations including, but not limited to, the Electricity Act 1992, the Electricity Industry Act 2010, the Electrical Industry Participation Code 2010 (Code) and Electricity (Safety) Regulations 2010.

The Electricity (Safety) Regulations 2010 and current amendments set out the very basic requirements for design to maintain public safety.

3.0 Safety co-ordination

Counties Power has established a Safety Management System with criteria to be applied to meet statutory requirements and other relevant codes imposed on the operators of distribution systems

Similar criteria and standards of Safety Management Systems are required to be provided by other users of the distribution system when carrying out work or tests at the operational interface with Counties Power.

Safety Co-ordination requirements are detailed in Part 6 of this document, the Distribution Operation Code, and apply to Counties Power and all users of Counties Power's distribution system and those who interface with it, including:

a. Embedded generators;

b. Other electricity distributors connected to the Counties Power distribution system;

c. Customers who take supply at high voltage; and

d. Any other party reasonably specified by Counties Power, including Contractors working on or near Counties Power distribution system.

Note: The safety management system follows *"NZS 7901:2014 Electricity and Gas Industries – Safety Management Systems for Public Safety".*

4.0 Distribution general conditions

The Distribution Code General Requirements are of general application to the Distribution Code. Their object is to ensure that, to the extent possible, all sections of the Distribution Code work together for the benefit of all users.

In the event of unforeseen circumstances or any matter of interpretation not envisaged by the provisions of the Distribution Code, Counties Power shall consult promptly with all affected users in an effort to reach agreement as to what should be done. If agreement cannot be reached in the time available, Counties Power shall determine what is to be done to ensure the correct operation of the system for all users. In so determining, it shall have regard wherever possible to the views expressed by the users, and in any event, what is reasonable in the circumstances. Each user shall comply with all instructions given to it by Counties Power following such a determination provided that the instructions are consistent with the then current technical parameters of the particular user's system notified under the Distribution Code.

The provisions of the Distribution Code and associated documents may be suspended in whole or in part during a declared Civil Defence Emergency.

The Distribution Code sets out procedures and principles governing the relationships between Counties Power, Electricity Retailers and users, but excluding customers supplied directly from a generator or from Transpower.

5.0 Distribution planning code

5.1 Distribution planning

5.1.1 Outline

The Distribution Planning Code (DPC) includes sections 5 to 9 of this Distribution Code and specifies the technical, design and connection criteria and the procedures to be complied with by Counties Power in the planning and development of its distribution system. The DPC also applies to users of the distribution system in the planning and development of their systems in so far as they affect the public electricity supply.

The user's requirements may necessitate the reinforcement of or the extension to the distribution system, and in some cases may require Counties Power to seek the reinforcement of or extension to the relevant Transpower interface capacity, such work being identified by Transpower or Counties Power as appropriate, as part of the discussions concerning the user's requirements.

The time required for the planning and development of the systems and any consequential requirement of the Transpower interface will be determined by the type and extent of the necessary reinforcement and/or extension work, the need or otherwise to obtain statutory or other consents by all parties, the associated possibility of a public inquiry and the degree of complexity in undertaking the new work whilst maintaining satisfactory security and quality of supply on the distribution system for existing customers.

The cost responsibility for any alteration or addition to the distribution system required for compliance with the Distribution Code, is part of the commercial arrangements between the parties concerned. The cost responsibility is not part of this Code.

Reference is made to supplying information or advice to users upon request by the user. Such information or advice as is relevant to the planning or connection process is to be furnished whether during the application for connection or otherwise.

Information exchanged for planning purposes is confidential to the parties holding the information. In many cases this will comprise sensitive commercial information and must be treated accordingly.

5.2 Objectives

The objectives of the Distribution Planning Code are:

a. To enable the distribution system to be planned, designed and constructed to operate economically, securely and safely;

b. To facilitate the use of the distribution system by others and to specify a standard of supply to be provided;

c. To establish technical conditions which facilitate the interfacing of systems at points of entry to and exit from the distribution system;

d. To formalise the exchange of system planning data; and

e. To provide sufficient information for a user to assess opportunities for connection and to plan and develop his system such as to be compatible with the distribution system.

5.3 Design principles and standards

5.3.1 Introduction

It is necessary to ensure that the distribution system conforms to the statutory requirements and licence conditions placed on the owner and operator or the system.

This section of the Distribution Code sets out the current principles and standards to be applied in the design of the distribution system and any user connections to that system.

Nothing in this Code is intended to inhibit design innovation or to restrict the introduction of new technology or systems where these are consistent with the overall objectives of this Code.

5.3.2 Standard of Supply

a. Security

The distribution system and any user system connected to that system shall be designed to be consistent with the security requirements of the customers supplied by the distribution system, and any relevant statutory Regulations and Electrical Codes of Practice. Counties Power's security planning guidelines are published in the Counties Power Asset Management Plan.

b. Frequency and Voltage

The distribution system and any user connections to that system shall be designed to enable the normal operating frequency and voltages to be supplied to customers, and to comply with statutory Regulations and Electrical Codes of Practice.

c. System Disturbances and Waveform Distortion

Distortion of the system voltage waveform caused by certain types of equipment may result in annoyance to users of the distribution system or damage to connected apparatus. Guidance on harmonic levels, motor starting, power factor correction, mains bourn signalling, etc., are contained in "Part 5 – Technical Interference Requirements".

Counties Power may require a user to implement corrective measures to limit the level of distortion, at its own expense, if the user's equipment does not comply with the requirements above. Under special circumstances Counties Power may consider other limits or levels.

Under fault and circuit switching conditions the rated frequency or 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 Network, and this variation in voltage must be considered by users when selecting user Equipment.

5.3.3 Design Principles

1. Specification of Equipment, Overhead Lines and Underground Cables

a. The principles of design, manufacture, testing and installation of distribution equipment, overhead lines and underground cables, including quality requirements, shall conform to applicable statutory obligations and shall comply with relevant standards approved for use in New Zealand. Further advice will be made available upon request to Counties Power;

b. The specifications of equipment, overhead lines and cables shall be such as to permit operation of Counties Power's distribution system within the currently applicable Electrical Safety Codes and Regulations;

c. Equipment 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, or is to be, connected, having due regard to the fault carrying capabilities and making and breaking duties. In appropriate circumstances, details of the system to which connection is to be made will be provided by Counties Power;

d. Equipment, overhead lines and underground cables shall be operated within the thermal rating conditions contained in the appropriate standards, specifications, and other relevant publications, taking into account the intended use. The technical specification of the relevant equipment items will be made available by Counties Power upon request; and

e. The standards, publications and specifications referred to above are those current at the time that the plant and/or apparatus was manufactured. If any such plant/apparatus is subsequently moved to a new location or used in a different way, or for a different purpose, or is otherwise modified, then it must be reasonably fit for its intended purpose, having due regard to the obligations of Counties Power and the user.

Earthing

The arrangements for connecting the system with Earth shall be designed to comply with the requirements of such statutory Regulations and NZECP: 35 1993 on *"New Zealand Electrical Code of Practice for Power System Earthing"* publication.

Guidance as to the design of earthing systems is contained in the EEA's current publication on "Guide to Power System Earthing Practice".

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 energy.

Voltage regulation and control

Any extension or connection to Counties Power's distribution system shall be designed in such a way that it does not adversely affect the voltage control employed by Counties Power on the distribution system. Information on the voltage regulation and control arrangements will be made available by Counties Power if requested by the user.

Protection

a. Counties Power's distribution system and the system of any user connected to Counties Power's distribution system shall incorporate protective devices in accordance with any relevant statutory Regulations and Electrical Codes of Practice and such codes of practice or other requirements as may be specified in an applicable Connection Agreement;

b. In order to ensure satisfactory operation of the Counties Power distribution system, it is necessary that protection systems; operating times; discrimination; and sensitivity at the ownership boundary shall be agreed between Counties Power and the user during the application for connection process, and may be reviewed from time to time by Counties Power, with the concurrence of the user;

c. In order to cover the instance of a circuit breaker, or equipment having a similar function, failing to operate correctly to interrupt fault current on a high voltage system, back-up protection by operation of other circuit breakers or equipment having a similar function must normally be provided. During the application for connection process, Counties Power will advise the user if the same is not required. If the equipment providing the back-up protection is owned by Counties Power, then this protection may be limited to that needed to meet statutory requirements in respect of the Counties Power distribution system; and

d. Unless Counties Power should advise otherwise, it is not acceptable for users to limit the fault current infeed to Counties Power's distribution system by the use of protection and associated equipment if the failure of that protection and associated equipment to operate as intended in the event of a fault could cause equipment owned by Counties Power to operate outside its short-circuit rating.

6.0 Connections to the distribution system

6.1 Outline

This section of the Distribution Code ensures that all users of the Distribution Code are subject to the same requirements for connection. It specifies the information required from users by Counties Power in order to ensure that adequate technical provision is made for new supplies or increases in existing load. It also applies to generators who operate in parallel with Counties Power system, where a supply is required from Counties Power under normal or emergency conditions. Information required from generators in respect of the import of energy to Counties Power system is covered in the Counties Power "Distribution Code - Part 4: Distributed Generation Requirements".

Section 13 of this document and the separate document "Distribution Code - Part 3: Metering Requirements for Electrical Installations" specify the general arrangements for metering of energy at every point of entry to or exit from Counties Power's distribution system and relates to all users.

6.2 Load characteristics

For supplies at low voltage, it is normally possible to assess whether a proposed connection is acceptable, and to determine the necessary supply arrangements, from analysis of the following limited data:

a. maximum power requirements (kVA);

b. type and electrical loading of equipment to be connected, e.g. number and size of motors, including maximum starting currents, and electrical heating arrangements; and

c. the date when the connection is required.

The application process and forms are accessed at the Counties Power website Connections page.

Should a preliminary examination of this data indicate that more detailed information is required, it shall be provided to Counties Power upon request where reasonably required for its system needs.

For supplies other than at low voltage, it may be necessary for the following more comprehensive information, in addition to that detailed above, to be provided on request:

1. All types of Demand:

    a. maximum active power requirement;

    b. maximum and minimum reactive power requirements;

    c. type of load and control arrangements. e.g. controlled rectifier or large motor drives with maximum starting currents;

    d. maximum load on each phase at the time of maximum demand;

    e. the maximum harmonic currents to be imposed on Counties Power distribution system.

2. Fluctuating Loads:

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 power 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 user's load on Counties Power distribution system. Such information may include an indication of the pattern of build-up of load and a proposed commissioning programme. This information will be specifically requested by Counties Power when necessary.

6.3 Connection arrangements

The design of connections between Counties Power's distribution system and users shall be in accordance with the principles set out in Section 5, subject to any modification to which Counties Power may reasonably consent.

Reference should be made to "Part 2: Network Connection Standard" for details of the process and information required.

During the application for connection process, Counties Power will agree with the user the voltage level to which a user will be connected in accordance with its normal practice for the type of load to be supplied. Counties Power may on occasion specify a different connection voltage from normal in order to avoid potential disturbance caused by the user's apparatus to other users of the Counties Power distribution system, or for other technical reasons, or may agree alternative methods for minimising the effects of disturbing loads.

Before entering into a Connection Agreement, it will be necessary for Counties Power to be reasonably satisfied that the user's system at the boundary with Counties Power's distribution system will comply with all appropriate requirements of the Distribution Code.

The user's installation shall comply with such statutory Regulations and Electrical Codes of Practice as maybe applicable.

6.4 Ownership boundaries

The point or points at which supply is given or taken between Counties Power's distribution system and users will be agreed between Counties Power and the user as required. For supplies at low voltage, the general rule is that the point of supply will be at the user's main switchboard for that supply, but that the ownership boundary will be at the boundary to that user's area within which the user has ownership rights. For high voltage supplies the points of supply will be subject to specific agreement between parties in each case. For connections between Electricity Distributors (ED's) and users, including busbar connected low voltage arrangements, the points of supply will also be subject to specific agreement between parties in each case.

The respective ownership of plant or apparatus will be recorded in a written agreement between Counties Power and the user as required. In the absence of a separate agreement between the parties to the contrary, construction, commissioning, control, operation and maintenance responsibilities will follow ownership or occupier rights.

For supplies at high voltage, and where required by statutory Regulations or Electrical Codes of Practice, Counties Power will, in conjunction with the user as necessary, prepare a responsibility schedule and, where determined by Counties Power during the application for connection process, an operation diagram showing the ownership boundary. Copies of these documents will be retained by Counties Power and user. Changes in the boundary arrangements proposed by either party must be agreed in advance and will be recorded on the operation diagram.

6.5 Communications

Where, for operational reasons, Counties Power determines that a means of routine and emergency communication between Counties Power and the user is required, then the same shall be provided and maintained by agreement.

6.6 Demand management

Where Counties Power or the user has an operational need for a co-ordinated means of demand management under normal conditions, arrangements shall be made to carry it out in accordance with policies negotiated under appropriate guidelines. This will normally require the transfer of instantaneous, half hour, and predicted load information to each participant on a real time basis. In addition, future predicted loads may be required in advance on a daily, weekly, monthly or other time frame.

Details of the amount of interruptible load available at typical times are to be advised to the other party, and significant changes to the times or amount of interruptible load at any time shall also be advised.

Demand management priorities are to be agreed in advance so these can be implemented in accordance with the established policy.

Arrangements for emergency demand management under abnormal system conditions, including those on the Transpower system, may also form part of the overall demand management policy, including requirements of Counties Power to manage a Participant Rolling Outage Plan under the EIPC. Information on the available emergency load shedding on the user's system shall be made available to Counties Power on request. Technical arrangements to carry out emergency load shedding on the user's system shall be installed at the cost of Counties Power at one location only. If emergency load shedding is required by the user to be fitted at additional locations, the user shall meet the cost of the additional equipment unless specific alternative arrangements are made between the parties.

7.0 Technical requirements for connection

7.1 Outline

This section specifies the technical arrangements required at the ownership boundary between Counties Power's distribution system and the system of a user and is applicable at all voltage levels.

7.2 Equipment at ownership boundary

All equipment at the ownership boundary shall meet the design principles contained in this Code. Connection for entry to and exit from Counties Power's distribution system shall incorporate a means of disconnection of the user's installation by Counties Power.

7.3 Protection requirements

Protection requirements vary widely depending on established practices and the needs of a particular distribution system. This protection may be at the ownership boundary, the point of supply or the meter panel or elsewhere to suit the local arrangements. The basic requirement in all cases is that user's arrangements for protection, including types of equipment and protection settings, must be compatible with standard practices on Counties Power distribution system, as specified by Counties Power during the application for connection process.

In particular:

a. maximum clearance times (from fault current inception to arc extinction) must be within the limits established by Counties Power in accordance with protection and equipment short circuit rating policy adopted for Counties Power distribution system;

b. in connecting to Counties Power distribution system, the user should be aware that auto-re-closing or sequential switching features may be in use on Counties Power distribution system. Counties Power will, on request, provide details of the auto-re-closing or sequential switching features in order that the user may take this into account in the design of the user system, including protection arrangements; and

c. the user should 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 and that installations may require suitable protection for such events (e.g. phase failure or under voltage protection).

7.4 Earthing

Earthing of that part of a user's system which is connected to Counties Power's distribution system shall comply with the arrangements specified in this Code.

7.5 Fault level considerations

The short circuit rating of user's equipment at the connection point should be not less than the design fault level of Counties Power's distribution system to which it is connected. The choice of equipment for connection at low voltage may take into account attenuation in the service mains. Counties Power, in the design of its system, will take into account the contribution to fault level of the user's 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 Counties Power distribution system.

7.6 Motor starting

Except where alternative arrangements are agreed in writing between Counties Power and the user, all motor starting is to comply with the EEA's current publication on Motor Starting Currents for AC Motors. Details regarding acceptable motor starting arrangements are covered in the *Distribution Code Part 5: Technical Interference Requirements*

8.0 SAFETY CO-ORDINATION

8.1 Outline

This section specifies the Safety Management System criteria to be applied by Counties Power to meet statutory requirement and other relevant codes, imposed upon owners and operators of Counties Power distribution system.

Similar criteria and standards of Safety Management Systems are required to be provided by other users of the distribution system when carrying out work or tests at the operational interface with Counties Power.

8.2 Objective

The objective is to lay down requirements with a view to ensuring safety of persons working on the distribution system and at or across operational and ownership boundaries.

8.3 Procedure

This section of the Distribution Code is to be applied by Counties Power and all user of Counties Power's distribution system and those who interface with it, including:

a. Embedded generators.

b. Other EDs connected to Counties Power distribution system.

c. Customers who take supply at high voltage.

d. Any other party reasonably specified by Counties Power, including Contractors working on or near Counties Power distribution system.

8.3.1 Safety Management Systems

Standard *NZS 7901:2014 Electricity and Gas Industries – Safety Management Systems for Public Safety* specifies the principles and procedures, and where appropriate, the documentation to be applied, so as to ensure the health and safety of all who are liable to be working or testing on the Counties Power distribution system, or on plant and apparatus connected to it. These will be established by Counties Power and other users as appropriate.

8.3.2 Operational Boundaries and Principles

At sites or location where an operational boundary exists, which parties Safety Management System is to be adopted and when, shall be jointly agreed. This will include provision for Control Persons to operate to the Safety Management Systems in use by field personnel where appropriate.

A system of documentation shall be maintained by Counties Power and the user which records the inter-system safety precautions taken when:

a. work or testing is to be carried out on high voltage plant and/or apparatus across the operational Boundary;

b. isolation and/or earthing of the other's system is needed.

Where relevant, copies of the Safety Management Systems and related documentation shall be exchanged between Counties Power and users for each operational boundary, and also, if appropriate, for each working occasion.

8.3.3 Authorised Personnel

The Safety Management System must include the provision for written authorisation of personnel concerned with the control, operation, work, or testing of plant and apparatus forming part of, or connected to, Counties Power distribution system.

Each individual authorisation shall indicate the class of operation and/or work permitted, and the section of the system to which the authorisation applies.

8.3.4 Environmental Safety

Arrangements shall be made by all parties to ensure that personnel are warned, by an appropriate means, of hazards specific to any site, before entering any area of the site. This shall include hazards that may be temporary or permanent. Where these risks include contamination or similar, suitable decontamination facilities and procedures shall be provided.

Arrangements shall be made to facilitate inspections by Counties Power management and safety representatives to site accommodating Counties Power owned plant and apparatus.

8.3.5 System Control

a. Control Responsibilities

Counties Power and users shall jointly agree and set down in writing schedules specifying the responsibilities for System Control of equipment. These shall ensure that only one party is responsible for any item of plant or apparatus at any one time.

Counties Power and each user shall at all times have nominated a person or persons responsible for the co-ordination of safety from the system pursuant to this section of the Distribution Code.

b. Control Documentation

Counties Power and users shall maintain a suitable system of documentation which records all relevant operational events that have taken place on Counties Power's distribution system or any other system connected to it, and the co-ordination of relevant safety precautions for work.

All documentation relevant to the operation of the distribution system, and to safety precautions taken for work or tests, shall be held by Counties Power and the appropriate user for a period of not less than one year.

c. System Diagrams

Diagrams illustrating sufficient and up to date information for control personnel to carry out their duties shall be exchanged by Counties Power and the appropriate user.

d. Communications

Where Counties Power reasonably specifies the need, suitable communication systems shall be established between Counties Power and other users to ensure the control function is carried out in a safe and secure manner.

Where Counties Power reasonably decides that a back-up or alternative routing of communication is necessary to provide for the safe and secure operation of Counties Power distribution system, the means shall be agreed with the appropriate users.

Schedules of telephone numbers/call signs shall be exchanged by Counties Power and appropriate users to enable control activities to be efficiently co-ordinated.

Counties Power and appropriate users will establish 24 hour availability of personnel with suitable authorisation where the joint operation requirements demand it.

8.3.6 Responsibility

a. Ownership, Operation and Maintenance Schedules

Schedules specifying the responsibilities for ownership, operation and maintenance shall be jointly agreed by Counties Power and appropriate users for each location where an operational interface or joint responsibilities exist.

b. Maintenance of Schedules and Diagrams

All schedules and diagrams shall be maintained by Counties Power and appropriate users and exchange as necessary to ensure they reflect the current agreements and network configuration.

8.4 Capacitive and inductive effects

The user shall, when applying to make a connection, provide Counties Power with information as detailed in Section 6. Details will be required of capacitor banks and reactors connected at high voltage which could affect Counties Power's distribution system and which it is proposed to connect if agreed by Counties Power. When requested by Counties Power, details shall also be provided of distributed circuit capacitance and inductance. Sufficient detail is required for the following:

a. to verify that controlling equipment of Counties Power's distribution system is suitably rated;

b. to show that the performance of Counties Power's distribution system will not be impaired; and

8.5 Telemetry

Counties Power will specify any telemetry and measurement equipment required for monitoring an Embedded Network or Distributed Generation.

Embedded or Distributed Generators, may be required in accordance with the Electricity Industry Participation Code (EIPC), to provide signals to Transpower's Control Centres for the efficient management of Transpower's Network including response to grid emergencies.

9.0 Requirements for distributed or embedded generation

Distributed Generation is defined as equipment that is used for generating electricity that is connected to a distribution network and capable of exporting energy into the network. Examples include solar, photo-voltaic, wind, gas, diesel and biomass. (Generation not connected to or unable to be operated in parallel with the Counties Power network is excluded e.g. standby generation with a load transfer switch).

Counties Power's policies and procedures for the application for, installation and connection of distributed generation follow the requirements of Electricity Industry Participation Code 2010 - Part 6 Connection of distributed generation.

Installing distributed generation is complex and has a wide range of implications including safety, network performance, service quality, investment in the network, potential transmission impacts and commercial agreements.

Any agreement to connect distributed generation to our network may include costs associated with design and reinforcement of the existing network. If network reinforcement is required, the design and schedule for this project work will need to be factored into your installation planning.

The document "Distribution Code - Part 4: Distributed Generation Requirements" provides detailed information for proposed connections. Associated with this are two information packs, one for generation of less that 10kW and one for greater than 10kW, these are also available on the Counties Power website.

10.0 Planning information

10.1 Outline

This section of the Distribution Code details the planning information to be exchanged between Counties Power and users, or, where appropriate, between Counties Power and an Electricity Retailer on behalf of its customers. It includes data that is necessary in order for Counties Power's distribution system to be developed in an efficient, co-ordinated and economic manner, and to enable Counties Power to comply with the legislative framework and to be transparent to all users.

10.2 Requirement for Counties Power

Counties Power will on request provide all relevant Counties Power Network parameters reasonably required for planning to a user.

10.3 Requirements for electricity retailer and other users

Users of the Counties Power distribution system, including Electricity Retailers on behalf of their customers, must provide sufficient planning data/information as requested by Counties Power from time to time to enable Counties Power to comply with the requirements of legislation. For those users from whom demand forecasts are required under Section 11.1, there may be a requirement to prepare an annual submission to Counties Power. This submission should include a development plan covering at least the subsequent 3 years and, where the user holds planning data or information relating to subsequent years, up to 7 years ahead. Such data or information shall include changes, either increasing or decreasing, in maximum demand, transfer requirements, or generating capacity as appropriate.

In addition to periodic updates of planning information, a user should give adequate notice of any significant changes to its system or operating regime to enable Counties Power 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 user's system or operating regime, the user shall notify Counties Power as soon as is practically possible to ensure any contingency measures, as necessary, can be implemented by Counties Power.

10.3.1 Reactive compensation plant

A user shall provide Counties Power with information on any reactive compensation plant directly or indirectly connected to the Counties Power distribution system, other than at low voltage, including:

a. the MVAr capacitive or inductive rating of the equipment and operating range if variable;

b. details of any automatic control logic such that the operating characteristics can be determined;

c. the point of connection to Counties Power distribution system; and

d. where attenuation of load control or any other superimposed signals has occurred, or is seen as a possibility, as a result of reactive equipment installation on the low voltage system, the information required in clauses (a) to (c) above may be required to be provided for the low voltage system.

10.3.2 Lumped network susceptance

Under certain circumstances, it will be necessary for the user to provide, at the request of Counties Power, details of the equivalent lumped network susceptance at normal frequency of the user's system at nominal frequency referred back to the connection with Counties Power distribution system. This should include any 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 (i.e. they are regarded as part of the cable).

It should not include:

a. independently switched reactive compensation plant connected to the user's system; or

b. any susceptance of the user's system inherent in the reactive demand.

10.3.3 Fault infeeds

Information shall be exchanged between Counties Power and the user on fault infeed levels at the point of connection with Counties Power's distribution system in the form of:

a. the maximum and minimum 3 phase symmetrical and phase-earth short circuit infeed;

b. the X/R ratio under short circuit conditions; and

c. in the case of interconnected systems, adequate equivalent network information

10.3.4 Interconnection impedance

For user interconnections that operate in parallel with the Counties Power distribution system, details of the interconnection impedance shall be exchanged between Counties Power and the user. This information shall include an equivalent single impedance (resistance, reactance and shunt susceptance) of the parallel user or electricity distribution system.

10.3.5 Demand transfer capability

Information shall be exchanged on demand transfer capability where the same demand may be supplied from alternative electricity distribution system or user points of supply. This shall include the proportion of demand normal fed from each point of supply and the arrangements (manual or automatic) for transfer under planned/fault outage conditions.

10.3.6 Non-ED distribution system data

Users, including adjacent electricity distributors, shall provide Counties Power with detailed data relating to the interface between their distribution system and that of Counties Power, covering circuit parameters, switchgear and Protection arrangements of equipment directly connected to or affecting the distribution system to enable Counties Power to assess any implications associated with these points of connection. Reciprocal arrangements will apply between Counties Power and its users.

10.3.7 Transient overvoltage effects

For a user's busbars connected to Counties Power distribution system, sufficient details may need to be exchanged with respect to the user/electricity distributor ownership boundary to enable an assessment, where necessary, of transient over voltage effects to be made. This information may relate to physical and electrical layouts, parameters, specifications and protection details.

10.3.8 Additional information

In certain circumstances, more detailed information may be needed and will be provided upon the reasonable request of Counties Power.

11.0 Distribution operations

Details regarding the issues associated with the operation of the network by Counties Power are contained in "Distribution Code - Part 6: Distribution Operational Code" (DOC).

These apply to users of the distribution system in terms of the operating of their systems and installations insofar as they affect the operation of the distribution system.

The DOC deals with various operational matters affecting users, including the provision of forecasts of likely demand, the planning of distribution system outages and generating plant outages, the reporting of operational changes and events, safety matters, and procedures for dealing with contingencies.

11.1 Demand forecasts

In order for Counties Power to operate its distribution system efficiently, and to ensure maximum system security and system stability, Counties Power must be able to forecast loadings on its system with sufficient accuracy and for a sufficiently long forward period it to enable it to plan the development of its system. It must also obtain sufficient information to enable it to comply with the requirements of Transpower which specifies the Transpower requirements regarding demand forecasting.

Forecasting requirements are detailed in Part 6 Distribution Operation Code and apply to the following users of the Counties Power distribution system:

a. Embedded or distributed generators with generating plant over 1 MW;

b. Any other electricity distributor connected to the Counties Power distribution system;

c. Electricity Retailers on behalf of their customers who are connected to the Counties Power distribution system; and

d. Direct supply customers with demands over 1 MW.

11.2 Outage planning

In order to plan and co-ordinate its construction, maintenance and operational activities internally and with activities of users and Transpower, Counties Power must be aware of planned outages of users' major plant and apparatus which may affect the operation of the Counties Power distribution system, or require the commitment of resources.

Outage planning requirements are detailed in the DOC and apply to the following users of the Counties Power distribution system:

a. Embedded generating plant in Counties Power's distribution system whose maximum generating capacity is greater than one MW, and which is not subject to central despatch;

b. Another electricity distributor connected to the Counties Power distribution system;

c. Electricity Retailers on behalf of themselves and their customers who are connected to the Counties Power distribution system;

d. Customers with own generation where Counties Power reasonably considers it appropriate; and

e. Direct supply customers connected to the high voltage network where Counties Power reasonably considers it appropriate.

11.2.1 Unplanned outages

In addition to planned outages there will arise from time to time, a need for outages to be scheduled for urgent work to be carried out sooner than they can be incorporated in the short-term plan. The handling of such outages will be agreed between Counties Power and relevant user(s) in accordance with procedures specified in the relevant Connection Agreement. Communication and co-ordination during outages caused by faults on the distribution system or plant or apparatus of any user will also be in accordance with procedures agreed at this time.

11.3 Testing and monitoring

To ensure that Counties Power's distribution system is operated efficiently and within statutory standards, and also to meet other statutory requirements and actions, Counties Power will arrange and carry out testing and/or monitoring of the effect of users' electrical apparatus to Counties Power distribution system.

Testing and monitoring requirements are detailed in Part 6 Distribution Operation Code and apply to the following users of the Counties Power distribution system:

a. Direct supply customers;

b. Other electricity distributors connected to the Counties Power distribution system;

c. Embedded generators; and

d. Electricity Retailers and any customer of any Electricity Retailer.

The testing and monitoring relate to two aspects of Counties Power distribution system, as follows:

a. Quality of Supply

b. Connection Point Parameters

At the discretion of Counties Power, Connection Agreements may contain schedules of charges to be levied on users for the carrying out of certain system tests under conditions specified in such agreements.

11.4 Demand control

This section of the Distribution Code is concerned with the provisions for demand control to be made by Counties Power or user with systems connected to the Counties Power distribution system. Procedures are established to enable Counties Power, following a request from Transpower or otherwise, to achieve a reduction in demand in order to avoid a breakdown or overload of any part of the total system or the distribution system of Counties Power in a manner that does not unduly discriminate against, or unduly prefer, any one customer or group of customers, Electricity Retailers or their customers.

The term “demand control” is used to describe

a. Voltage reduction;

b. Customer demand management initiated by Counties Power or Electricity Retailers;

c. Customers disconnection;

d. Automatic low frequency disconnection; and

e. Emergency manual customer disconnection.

Customers who may be designated from time-to-time as being in a protected category, as may be specified in this Distribution Code or in any Connection Agreement, cannot be guaranteed protection during times of system incident management.

Demand control requirements are detailed in the DOC and apply to all users of the Counties Power distribution system.

11.5 Operational liaison

This section of the Distribution Code sets out requirements for the exchange of information in relation to operations and/or events on the Counties Power distribution system, or the system of any user connected to the Counties Power distribution system, which have had, or may have had, or will have, or may have, an operational effect on Counties Power’s distribution system or the system of any other user. This is to enable the implications of an operation and/or event to be considered, the possible risks arising from it to be assessed,

and appropriate action taken by the relevant party or parties in order to retain the integrity of the total system. It is not sought to deal with any actions arising from the exchange of information, but merely with that exchange.

Operational liaison requirements are detailed in Part 6 Distribution Operation Code and apply to the following users of the Counties Power distribution system:

a. direct supply customers;

b. other EDs connected to Counties Power distribution system;

c. embedded generators connected at high voltage;

d. Electricity Retailers alone or on behalf of their customer; and

e. where specified by Counties Power, individual large customers connected at high voltage to the Counties Power system.

12.0 Civil emergencies

Counties Power has an obligation to carry out certain Civil Emergency actions related to its distribution system. Under such emergencies the actions of Counties Power and all parties connected either directly or indirectly to Counties Power's distribution system will be governed by the procedures laid down in the relevant portions of the Civil Defence Emergency Management (CDEM) Act 2002. Counties Power must prepare plans to deal with Civil emergencies, in accordance with the requirements of the Civil Defence Emergency Management (CDEM) Act 2002, and will liaise with the local Civil Defence Controller in the preparation of such plans. Counties Power is also involved in regional Lifelines Groups (Auckland and Waikato), and must cooperate with the relevant Lifelines Utilities Coordinator (LUC) during emergency events.

13.0 Metering

13.1 Outline

In general, as well as for revenue metering purposes, metering will be required at ownership boundaries and other critical points on the distribution system to provide vital and sufficient information for the short and long term operation, planning, design and development of Counties Power distribution system.

Counties Power's requirements for revenue metering are detailed in the document "Distribution Code - Part 3: Metering Requirements for Electrical Installations", and all revenue metering installed on customer installations

connected to the Counties Power distribution system shall comply with those requirements, irrespective of the owner of the revenue metering equipment.

Such metering should, where required, provide load information and power flows to any Supervisory Control and Data Acquisition (SCADA) equipment for System Control purposes.

Space shall be provided in a user's or customer's building for metering equipment required by the Distribution Code. Access to this space by the owner of the metering equipment shall be permitted at all reasonable times.

13.2 Metering arrangements

Counties Power or any owner of metering equipment required by the Distribution Code shall, on request from a user or Counties Power, having a justifiable need of the data, make this data available on reasonable terms.

It shall be incumbent on the owner of the metering required by the Distribution Code to retain the metering data received from this metering for a period of not less than three years.

Where from whatever cause, metering information is not available from metering required by the Distribution Code and is available from a user or other electricity distributor, such data shall be made available on reasonable request and terms.

14.0 Document Information

14.1 DEFINITIONS

AC	Alternating Current
Act	The Electricity Act 1992
Active Power	The product of voltage and in-phase component of alternating current (normally measured in kilowatts (kW) or MWs (MW)).
Apparatus	All machines, fittings, and appliances in which conductors are used or supported, or of which thy may form a part.
Apparent Power	The product of voltage and alternating current (normally measured in kilovoltamperes (kVA) or megavoltamperes (MVA)).
Authorisation	The formal sanction, preferably given in writing, to undertake specified tasks that have a specific meaning in Safety Management Systems.
Back-up Protection	That Protection System which will open a Circuit Breaker or other fault-current interrupting device in the absence of the correct operation of the primary Protection System/
Black Start	The procedure necessary for a generator to recover from a Total or Local System Shutdown.
Black Start Capability	The ability of a Power Station to commence generating without the need for a power supply external to Power Station.
Breakdown	An occurrence relating to Equipment which prevents that Equipment performing its correct function within the Distribution System.
Central Despatch	The Despatch of Generating Units by Transpower as System Operator.
Circuit Breaker	A mechanical switching device capable of making, carrying and breaking currents under normal conditions, and also of making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.
Civil Emergency	A state of National, Regional or Local Civil Defence Emergency as declared by the appropriate Civil Defence Controller.
Commissioning	The final process of testing part of a System prior to that part of the System being considered suitable for normal use.
Connection Agreement	An agreement setting out terms relating to a connection to Counties Power's distribution system (excluding any such agreement with Transpower).
Connection Point	A point of supply to or from a User.
Control Centre	A location for the control and operation of all or of part of a Distribution System, the Transpower Transmission System, or the System of a User.
Control Person	A person who has been nominated by Counties Power, Transpower or a User to be responsible for controlling and coordinating System operations.
Control Phase	The period 0-24 hours inclusive ahead of real time operation.
Customer	Any person or organisation (other than an Electricity Retailer or an Electricity Distributor) who is supplied, or who applies to be supplied, with electricity. (Also defined as a "Consumer" in the Electricity Act 1992).

Customer With Own Generation	A Customer with one or more Generating Units connected to the Customer's
DC	Direct Current.
Demand	The electricity demand expressed in kVA/MVA, kW/MW or kAr/MVAr of Apparent Power, Active Power and Reactive Power respectively.
Design Rating	The maximum current or voltage, or combination of both, which an item of equipment is intended to have applied to it, taking into account cyclic variations of that voltage and current, together with other parameters as appropriate to specific items of Equipment.
Despatch	The issue of instructions for Generating Units to achieve specific Active Power and Reactive Power outputs within Registered Data parameters and by stated times.
Direct-Supply Customer	A Customer who contracts directly with Counties Power for the supply of line function services but excluding Electricity Retailers.
Distribution System	A 110kV and lower voltage electrical network operated by an electricity distributor or an authorised User but excluding Transpower.
EA	Electricity Authority (Authority) is an independent Crown entity responsible for regulating the New Zealand electricity market
EIPC	Electricity Industry Participation Code 2010 (Code)
Electricity Distributor (ED)	A person or organisation who supplies line function services to any other person or organisation
Electricity Retailer (ER)	A person or organisation who supplies electricity to another person or organisation for any purpose other than for resupply by the other person or organisation.
Electrical Code of Practice	An Electrical Code of Practice issued pursuant to the Electricity Act 1992.
Embedded	Having a direct electrical connection to a Distribution System.
Embedded Generator	A person or organisation who generates electricity and whose Generating Units are directly connected to a Distribution System, and includes Customers with Own Generation.
Equipment	Plant and/or Apparatus.
EEA	Electricity Engineers' Association
Event	An unscheduled or unplanned (although it may be anticipated) occurrence on or relating to a System, including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.
Fault Level	Prospective current that would flow into a short-circuit at a stated point on the System and which may be expressed in kA or, if referred to a particular voltage, in MVA.
Generating Plant	A power station including any Generation Unit therein.
Generating Unit	Any Apparatus which produces electricity.
Generator	A person or organisation who generates electricity.
High Voltage	Any Voltage exceeding 650 volts.

Isolated	Disconnected from association Equipment by an isolator or by adequate physical separation.
kVA	Kilovoltampere (1000 volt-amperes).
kW	Kilowatt (1000 watts).
Line Function Services	a)The provision and maintenance of works for the conveyance of electricity b) The operation of such works, including the control of voltage and assumption of responsibility for losses of electricity.
Low Voltage	Any Voltage normally exceeding 32 volts alternating current or 50 volts direct current but not exceeding 650 volts.
Minister	The Minister of Energy.
MVA	Megavoltampere (1,000,000 volt-ampere).
MVAr	Megavar (1,000,000 vars).
MW	MW (1,000,000 watts).
Negative Phase Sequence	A term used within the theory of symmetrical components which is method of analysing an AC multiphase System.
NZCCPTS	The New Zealand Committee for the Co-ordination of Power and Telecommunication Systems Incorporated.
Normal Operating Frequency	The number of Alternating Current cycles per second, expressed in Hertz, at which the System normally operates, i.e. 50 Hertz
NZECP	New Zealand Electrical Code of Practice
Operation	A scheduled or planned action carried out on a System.
Operational Boundary	The boundary between the Equipment operated by an ED or a User and the Equipment operated by another, as specified in the relevant site responsibility schedules.
Operational Diagram	A diagram which is a schematic representation of the HV Apparatus and the connections to all external circuits at a Connection Point, incorporating its numbering, nomenclature and labelling.
Outage	Removal of equipment from service (generally to permit maintenance or other work to be undertaken).
Overloading	The condition under which part of a System is subject to a Demand in excess of the normal design rating of that part of the System and not due directly to System fault current.
Ownership Boundary	The boundary between the Equipment owned by one ED or User and the Equipment owned by another.
Planned Outage	A pre-planned outage of Generating Plant or of part of the Transpower Transmission System or of part of a Distribution System.
Plant	Fixed and movable items used in the generation and/or supply and/or transmission of electricity other than Apparatus.
Power Factor	The ratio of Active Power to Apparent Power.

Power Station	An installation comprising one or more Generating Units, even where sited separately, which are owned and/or controlled by the same Generator and may reasonably be considered as being managed as one Power Station.
Protection	The provisions for detecting abnormal conditions in a System and initiating fault clearance, or actuating signals or indications.
Reactive Power	The product of voltage and current and the sine of the phase angle between them which is normally measured in Kilovars (kVAr) or Megavars (MVAr).
Regulations	Regulations made pursuant to the Electricity Act 1992.
Safety Management	The procedures adopted by Counties Power or a User to ensure the safe Operation of its System and the safety of personnel required to work on that System.
Safety Procedures	The procedures specified within a Safety Management System or Code.
Scheduling	The procedure for determining intended usage of Generating Plant.
Standby	The supply of electricity by an ER to a Customer on a periodic or intermittent basis to make good any shortfall between the Customer's total supply requirements and that met by his own generation.
Superimposed Signals	Those electrical signals carried on a Distribution System for the purpose of information transfer or load management.
System Control	The administrative and other arrangements established to maintain as far as possible the proper safety and security of a System.
System	A network running at various voltages.
System Stability	The state of the System whereby predicted changes in load and generation can be accommodated without any detrimental effect on the System.
System Tests	Those tests which involve simulating conditions or the controlled application of irregular, unusual or extreme conditions on the Total System or any part of it, but not including routine testing, commissioning or re-commissioning tests.
Top-up	The supply of electricity to a Customer on a continuing or regular basis to made good any shortfall between the Customer's total supply requirements and that met from other sources.
Total System	The Transpower Transmission System and the Distribution Systems of all EDs and any other Transmission or Distribution Systems connected to these at a particular time in either of the North Island or the South Island of New Zealand respectively.
Transpower	Transpower New Zealand Limited, a company incorporated under the Companies Act 1955, and the owner and operator of the National Grid.
User	A term used in various sections of the Distribution Code to refer to any person or organisation using the Distribution System, but excluding Transpower. It includes all Embedded Generators and other EDs connected to a Distribution System, and where appropriate, Electricity Retailers acting on behalf of their customers.

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14.3 DOCUMENT OWNER

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14.4 DOCUMENT CHANGE REQUEST

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