



Operating Code OC4 – Demand Control

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Operating Code OC4 – Demand Control

OC4.1 Introduction

Operating Code OC4 is concerned with Demand Control measures and procedures for implementing such measures. The term “Demand Control” in OC4 refers to measures that allow 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.

OC4 deals with the following aspects of Demand Control;

- Consumer Demand management initiated by OETC;
- Planned manual de-energisation or emergency manual de-energisation of Demand initiated by OETC;
- Consumer Demand management initiated by Licensed Distributors;
- 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 Imminent Warnings and Red warnings.

OC4.2 Scope

In addition to OETC, OC4 applies to;

- Power Producers;
- Licensed Distributors;
- Licensed Suppliers;
- Directly Connected Consumers;
- International Interconnected Parties;
- Internally Interconnected Parties;
- PWP (for information exchange); and
- RAEC if Connected to the Total System.

OC4.3 Objective

The objectives of OC4 are as follows;

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

OC4 requires OETC to ensure that all parties affected by Demand Control are treated equitably and that Demand Control is used as a last resort and only after all other means of securing System security have been exhausted.



OC4.4 Methods of Demand Control

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 OETC, Users and Directly Connected Consumers in respect of these means of Demand Control are set out below. All plans and implementation of Demand de-energisation shall pay due attention to the need to protect certain classes of Consumers, e.g., hospitals, etc.

(i) Consumer Demand Side Management agreements

Directly Connected Consumer's may enter into Demand Side Management (DSM) agreements with OETC to provide Demand reduction services. The terms of DSM agreements may provide for;

- Directly Connected Consumer's reducing Demand at certain times of the day and at certain periods of the year; and
- Directly Connected Consumer's reducing their Demand at OETC's instruction for an agreed number of occasions in a year.

Directly Connected Consumers with DSM agreements with OETC may remain Connected to the Transmission System at times when other Consumers and Users have been manually de-energised.

Consumers who are not Directly Connected to the Transmission System may have DSM agreements with a Licensed Supplier. As OETC is not a party to DSM agreements between Consumers and Licensed Suppliers such agreements are not subject to the provisions of OC4. However, Licensed Suppliers must notify OETC of all DSM agreements that provide for a reduction of Demand of 1MW or more.

(ii) Emergency Manual Demand Shedding

OETC may implement Emergency Manual Demand Shedding by issuing an instruction to manually de-energise to Licensed Distributors, Users, and Directly Connected Consumers. OETC shall issue such instructions in accordance with plans prepared in paragraph OC4.5 that establish 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.

In circumstances where thermal or stability considerations require it to do so OETC may itself manually de-energise Licensed Distributors, Directly Connected Consumers and Users.

Each Licensed Distributor shall implement an instruction to manually de-energise issued by OETC 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 irrespective of Frequency within 30 minutes. It must be possible to manually de-energise a proportion of Demand as determined by OETC;



- (b) 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 an individual Connection Point and/or groups of Connection Points;
- (c) once manual de-energisation has been applied by a Licensed Distributor in accordance with an instruction from OETC, that Licensed Distributor shall not re-energise the manually de-energised Demand until OETC instructs it to do so and the process of re-energisation must begin within 2 minutes of the instruction being given by OETC; and
- (d) 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 disconnectable; and
 - confirm that a minimum of 20% of total Demand can be manually de-energised in the first 5 minutes following instruction from OETC.

OETC will notify a Licensed Distributor who was issued with an instruction requiring manual de-energisation of the events on the Transmission System that necessitated the instruction. In circumstances of protracted shortage of Generation Capacity or where a statutory instruction has been given and when a reduction in Demand is envisaged by OETC to be prolonged, OETC will notify the Licensed Distributor of the expected duration of the de-energisation.

If OETC determines that Emergency Manual Demand Shedding is inadequate, OETC may itself manually de-energise and re-energise a Licensed Distributor as part of a Demand Control requirement under Emergency Conditions.

To ensure Directly Connected Consumers and other Users can implement an instruction from OETC requiring manual de-energisation;

- (a) each Directly Connected Consumer and User shall make arrangements that allow it to comply with an instruction from OETC to manually de-energise under Emergency Conditions irrespective of Frequency within 30 minutes. It must be possible to apply the manual de-energisations to individual Connection Points, as determined by OETC;
- (b) each Directly Connected Consumer and User shall implement the instructions of OETC with regard to manual de-energisation without delay, and the manual de-energisation must be achieved as soon as possible after the instruction being given by OETC. The instruction may relate to an individual Connection Point and/or groups of Connection Points;
- (c) once a manual de-energisation has been applied by a Directly Connected Consumer or User at the instruction of OETC, the Directly Connected Consumer or User shall not re-energise until OETC instructs it to do so and the process of re-energisation must begin within 2 minutes of the instruction being given by OETC; and



- (d) each Directly Connected Consumer and User shall provide OETC in writing by the end of October in each calendar year, in respect of the next 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, 15, and 30 minutes.

OETC will notify a Directly Connected Consumer or User who has been issued with an instruction requiring manual de-energisation of the events on the Transmission System that necessitated the instruction. In circumstances of protracted shortage of Generation Capacity or where a statutory instruction has been given and when a reduction in Demand is envisaged by OETC to be prolonged, OETC will notify the Directly Connected Consumer or User of the expected duration of the de-energisation.

If OETC determines that Emergency Manual Demand Shedding is inadequate, OETC may itself manually de-energise and re-energise Directly Connected Consumers and Users as part of a Demand Control requirement under Emergency Conditions.

(iii) 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 System, manual de-energisation of Demand will be implemented on a rota basis.

OETC shall develop Demand shedding rotas in consultation with Licensed Distributors, Directly Connected Consumers and other Users. Planned Rota Demand Shedding 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 1 hour, after which their supplies shall be re-energised and another group of Consumers de-energised.

OETC shall amend any Planned Rota Demand Shedding prior to implementation if, in OETC's opinion, operational considerations require it to do so. OETC shall notify each User of the total amount of Demand that shall be de-energised at different times.



(iv) De-energisation of Demand by automatic under-frequency relays

Automatic Demand de-energisation through under-frequency relay Demand shedding is normally used to address short-term imbalances in the Generation Capacity and Demand situation, and generally following the tripping of an amount of Generation Capacity beyond the planned contingency value. It is a method of safeguarding the stability of the Transmission 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. OETC shall determine the proportion of Demand that is required to be de-energised at each stage of falling Frequency and agree with Licensed Distributors those feeders that will be de-energised.

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 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 Connection 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 re-energise 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 re-energisation of Demand. Re-energisation of Demand by Licensed Distributors must be achieved as soon as possible and the process of re-energisation must begin within 2 minutes of the instruction being given by OETC.

Each Directly Connected Consumer and User shall make arrangements to allow approximately 40% of its annual maximum Demand (subject to discussion with OETC) to be de-energised by automatic under-frequency relays. These arrangements shall allow



automatic de-energisation to occur in a number of stages with specified proportions of Demand being de-energised at each level of Frequency. OETC shall determine the proportion of Demand that is required to be de-energised at each stage of falling Frequency and agree with Directly Connected Consumers and Users those feeders that will be de-energised.

The Demand of each Directly Connected Consumer and User that is subject to automatic under-frequency de-energisation will be split into discrete MW blocks. The number, location, size and the associated under-frequency settings of each blocks, will be specified by OETC by the end of October in each calendar year following discussion with Directly Connected Consumers and Users. OETC will review the arrangements for each discrete MW block annually and prepare a schedule of the agreed arrangements covering all Directly Connected Consumers and Users.

Licensed Distributors, Directly Connected Consumers and Users shall provide OETC with an estimate of the Demand reduction that occurred under automatic under-frequency Demand de-energisation as soon as practical. Usually verbal information is expected within 10 minutes and written confirmation within 1 day.

Licensed Distributors, Directly Connected Consumers and Users shall provide OETC with an estimate of the time at which Demand was restored following an automatic under-frequency Demand de-energisation. The estimate shall be provided to OETC as soon as practical. Usually verbal information is expected within 10 minutes and written confirmation within 1 day.

OC4.5 Procedures for implementing Demand Control

OETC shall prepare procedures for the implementation of the Demand Control measures contained in OC4. The Grid Code Review Panel shall review and approve the procedures proposed by OETC. In drawing up procedures for the implementation of Demand Control measures OETC shall demonstrate that Demand Control will be used as the last option in OETC's plans to maintain the stability of the Transmission System, and will be used in an equitable manner.

When drawing up its proposals for the implementation of Demand Control measures OETC shall consult with all parties to the Grid Code including the PWP.

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

OC4.6 Warning system

OETC shall issue advance warnings as soon as it considers an Alert 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. Recipients of Demand Control warnings 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 unless OETC so issues an instruction.

If a Licensed Distributor or Internally Interconnected Party considers it necessary to apply Demand Control measures to preserve the integrity of its 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 endeavor to discuss the situation with OETC prior to the implementation of Demand Control measures and shall notify OETC as soon as possible

(i) Demand Control Imminent Warning

OETC will issue a Demand Control Imminent Warning to Licensed Distributors, Directly Connected Consumers and Users who may subsequently receive instruction requiring Emergency Manual Demand Shedding.

A Demand Control Imminent Warning need not be preceded by any other warning and will be issued when OETC expects to issue an instruction requiring Emergency Manual Demand Shedding within the following 30 minutes.

A Demand Control Imminent Warning will automatically lapse if not reissued by OETC within 2 hours of the time of issue.

(ii) Red Warning

OETC will issue a Demand Control Red Warning by 16:00 hours on the day ahead to Licensed Distributors, Directly Connected Consumers and Users who may receive instructions on the day ahead concerning Emergency Manual Demand Shedding or Planned Rota Demand Shedding. A Demand Control Red Warning will also be issued to Power Producers with CDGensets that may be affected by such instructions.

A Demand Control Red Warning will specify the period during which Demand shedding may be required and the part of the Transmission System to which it may apply, the percentage of Demand reduction that OETC may require and any other matters.

(iii) Form of warnings

The form of warnings is given in Appendix B.

OC4.7 Post event reporting

Demand Control instructions may be either to de-energise Demand or to restore Demand. Following the issue of a Demand Control instruction by OETC, recipients shall notify OETC in writing (or by electronic media as agreed in writing with OETC) that they complied with OETC's instruction. Telephone communication, which has to be recorded in log book, is sufficient in real time. This has to be confirmed in writing within 1 day. For de-energisations the notification shall include an estimate of the Demand reduction and the time at which the de-energisation occurred. For restorations the notification shall include an estimate of the amount of Demand restored and the time at which the restoration was achieved.



All Users shall provided 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.

OC4.8 Scheduling and Dispatch during Demand Control

During Demand Control, Scheduling and Dispatch in accordance with the Merit Order may cease and will not be re-implemented until OETC so decides.



Appendix A Emergency Manual Demand Shedding/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.



Appendix B Form of warnings

Demand Control Imminent Warning

The form of a Demand Control Imminent Warning will be;

- This is Demand Control Imminent Warning timed at (xx.xx) hours;
- This warning applies to (include name of Users and area/ substations affected);
- Prepare for Emergency Manual Demand Shedding of (XX) MW within the next 30 minutes;
- Do not shed Demand until instructed;
- Standby for further instructions.

Demand Control Red Warning

The form of a Demand Control Red Warning will be;

- This is Demand Control Red Warning timed at (xx.xx) hours;
- This warning applies to (include name of Users and area/ substations affected) to implement (*Emergency Manual Demand Shedding or Planned Rota Demand Shedding*) tomorrow;
- The amount of Demand to be shed will be (*specify amount and duration of demand to be shed*);
- Do not shed Demand until instructed.