



Scheduling and Dispatch Code SDC3 - Frequency Control

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Scheduling and Dispatch Code SDC3 - Frequency Control

SDC3.1 Introduction

To maintain the security and quality of electricity Supply, the Frequency of the Total System must be maintained within specified limits. SCD3 describes Frequency control procedures to allow OETC to meet its License requirement to maintain the Frequency of the Total System and the Electric Time within specified limits.

These procedures include;

- Gensets operating in a Frequency Sensitive Mode;
- Demand Control; and
- Dispatch of Gensets.

SDC3 is complementary to SDC1 and SDC2.

SDC3.2 Objective

The objective of SCD3 is to clarify the Frequency control procedures required by OETC to maintain the security and quality of electricity Supply from the Total System and (as far as possible) to maintain the Electric Time in accordance with the limits specified in this code.

SDC3.3 Scope

In addition to OETC and PWP, SDC3 applies to;

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

SDC3.4 Response from CDGensets

SDC3.4.1 Capability

Each CDGenset must at all times have the capability to operate automatically so as to provide response to changes to System Frequency. This will be provided for and complied with in accordance with the requirements of a relevant PWPA or PPA.

SDC3.4.2 Frequency Sensitive Mode

Frequency Sensitive Mode is the generic description whereby the Active Power output of a Genset will change automatically in response to changes in System Frequency. This also permits the Genset to operate in accordance with an instruction to provide Primary Response and/or Secondary Response. A Power Producer must not countermand a change in the Active Power output of a CDGenset induced by a change in System Frequency that assists recovery to Target Frequency. The only exceptions are where a change in the Active Power output of a CDGenset must be carried out on safety grounds (relating to either Persons or Plant) or to ensure the integrity of the Generating Plant.



SDC3.4.3 OETC Dispatch Instructions

OETC will issue Dispatch Instructions to regulate the Frequency of the Total System to meet the requirements of Frequency control. Generating Plant operating in Frequency Sensitive Mode are required to operate taking into account the Target Frequency notified by OETC.

OETC will give 15 minutes notice of variation of Target Frequency.

The Frequency of the Total System shall be nominally 50.00 Hz with System Frequency set points between 49.95Hz and 50.05Hz. Normal control deviations will not exceed 49.90Hz to 50.10Hz. Under transient disturbed conditions, System Frequency could rise to 51.50Hz or fall to 48.00Hz.

SDC3.4.4 Low Frequency initiated response from Gensets

If Frequency falls below Target Frequency, output from the CDGenset should be maintained. CDGensets that have provided Primary Response shall not be de-energised provided that the System Frequency is above 47.5Hz. A Power Producer must not reduce the power increase of a CDGenset induced by a change in Frequency of the Total System that assists recovery to Target Frequency.

CDGensets shall remain Connected to the Total System at Frequencies down to 47.5Hz. Thereafter, CDGensets may be de-energised from the Total System to ensure integrity of the Plant but should be kept running to supply local Demand wherever possible and so that they are Available to assist Total System recovery promptly.

If the Frequency of the Total System falls below 47.5Hz, Power Producers will be required to take action to protect their Generating Plant and in such circumstances the requirement not to disconnect CDGensets from the Transmission System does not apply.

OETC in certain circumstances may issue Emergency Instructions to CDGensets and for Plant held as Tertiary Reserve to be synchronised and Generate output.

SDC3.5 Low Frequency initiated response from Users

Licensed Suppliers and Directly Connected Consumers shall follow the requirements of OC4 – Demand Control that sets out the procedures that may be instructed by OETC in the event of low Frequency.

The situations covered in OC4 relevant to action in the event of low Frequency include;

- Planned manual de-energisation or emergency manual de-energisation of Demand initiated by OETC; and
- De-energisation of Demand by automatic Demand shedding equipment and automatic relays to preserve Total System security.

SDC3.6 Actions to be undertaken by International Interconnected Parties

OETC shall agree with International Interconnected Parties plans of action in the event of abnormal Frequency that could occur due to events on either System. Where possible, adjacent Systems shall endeavour to provide mutual support but the over-riding priority shall be to maintain their Systems in Operation. Suitable automatic relaying may need to be put in place to assist this.



SDC3.7 Actions to be undertaken by Internally Interconnected Parties

OETC shall agree with Internally Interconnected Parties plans of action in the event of abnormal Frequency occurring on the Total System. These plans shall require Generating Plant owned by the Internally Interconnected Party to be operated in Frequency Sensitive Mode and respond positively to attempts to correct the Frequency deviation.

OETC may also agree Demand Control arrangements whereby the Internally Interconnected Party reduces Demand on instruction from OETC or by automatic under Frequency relays.

The over-riding priority of Internally Interconnected Parties shall be to maintain their Systems in Operation and be able to assist OETC in restoring the Total System. Suitable automatic relaying may have to be put in place to assist safe separation of the Systems. OETC will discuss each situation with the respective party and they should jointly determine the optimum solution for that situation. OETC will implement and meet the costs of the relaying system unless the sole beneficiary is the other party in which case implementation and costs fall to the other party. If OETC and the other party cannot reach agreement, OETC will determine and implement the required relaying system.

SDC3.8 Action to be undertaken during sustained abnormal Frequency conditions

SDC3.8.1 Actions during sustained low Frequency conditions

OETC shall issue instructions to minimise the duration of any low Frequency conditions. Instructions will be given to Power Producers to synchronise Available CDGensets and maximise CDGenset output whilst maintaining some reserve Capacity to manage Frequency control.

OETC shall also issue instructions to Licensed Distributors and Directly Connected Consumers to institute pre-arranged Demand Control to reduce Demand to match Available Generation output and so restore the Frequency of the Total System to within the normal set point range. The instructions may include;

- Consumer Demand Control initiated by Licensed Distributors;
- Consumer Demand Control initiated by OETC; and
- Planned manual de-energisation or emergency manual de-energisation of Demand initiated by OETC, possibly including rota Demand shedding.

SDC3.8.2 Actions during sustained high Frequency conditions

CDGensets that have provided negative Primary Response shall not be de-energised provided that the System Frequency is below 51.50 Hz and the CDGenset loading is above Minimum Generation. If the Frequency of the Total System is at or above 51.50 Hz, the Power Producer is required to take action to protect the Generating Plant and the requirement to make all reasonable efforts to avoid tripping does not apply.

In the event of the Frequency of the Total System becoming stable above 50.50 Hz, after all CDGenset action has taken place, OETC shall issue Dispatch Instructions to trip appropriate CDGensets to bring the Frequency of the Total System to 50.00 Hz or below and follow this with Dispatch Instructions to return the Frequency to Target Frequency.



SDC3.9 Electric time

OETC shall endeavour (in so far as it is able) to control Electric Time to within plus or minus 10 seconds of Oman official time by specifying changes to Target Frequency as part of Dispatch Instructions, taking into account the Generation Schedule and Desalination Schedule and forecast Generating Plant/Demand margins.

OETC shall be responsible for monitoring and recording Electric Time error.