

**SUBJECT:**

Harmonic Distortion Limitation

**OBJECTIVES:**

All members within the service area of MYEC who take delivery of electric service are required to comply with this Rule and Regulation pertaining to harmonics.

**POLICY:**

A. Definitions:

- a. Harmonics – In 60-hertz electric power systems, a harmonic is a sinusoidal component of the 60-hertz fundamental wave having a frequency that is an integral multiple of the fundamental frequency.
- b. Excessive Harmonics – In this policy, shall mean levels of current or voltage distortion at the point of common coupling between MYEC and the member outside the levels recommended in IEEE Standard 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems.
- c. Point of Common Coupling (PCC) – The point of interconnection to the member either at the primary metering point or the high side of the transformer.
- d. Total Demand Distortion (TDD) – It is a measure of the total harmonic current distortion at the PCC for the total connected load.

B. Member Responsibility:

The member shall maintain Total Demand Distortion (TDD) less than the values identified in the following table:

Current Distortion Limits for General Distribution Systems  
(120 V through 69,000 V)

A. Maximum Harmonic Current Distortion						
In Percent of $I_L$						
Individual Harmonic Order (Odd Harmonics)						
$I_{sc}/I_L$	$<11^{th}$	$11^{th}<17^{th}$	$17^{th}<23^{rd}$	$23^{rd}<35^{th}$	$35^{th}$	TDD
$<20^*$	4.0	2.0	1.5	0.6	0.3	5.0
20<50	7.0	3.5	2.5	1.0	0.5	8.0
50<100	10.0	4.5	4.0	1.5	0.7	12.0
100<1000	12.0	5.5	5.0	2.0	1.0	15.0
$>1000$	15.0	7.0	6.0	2.5	1.4	20.0

- $I_{sc}$  is the short circuit current available from MYEC at the point of common coupling.
- $I_L$  is the maximum demand load current (fundamental frequency component) on the MYEC point of common coupling.  $I_L$  is calculated as the current associated with the demand at the time of measurement or as recorded on a demand meter.
- \* All power generation equipment is limited to these values of current distortion regardless of  $I_{sc}/I_L$ .

Even harmonics are limited to 25% of the odd harmonic limits listed above. The current distortion limits apply to a demand interval of 15 minutes if demand metered, otherwise is the value recorded at the time of measurement. Current distortions that result in a direct current offset (e.g., half-wave converter) are

not allowed. Failure to comply with the direct current offset conditions may result in a disconnection of the member's service. Before disconnecting, MYEC must provide written notice of its intent to disconnect at least five (5) working days before doing so. MYEC may disconnect the member five (5) working days after providing the notice, unless the member ceases using the direct current offset device.

If the measured TDD or individual harmonic order values are greater than the above values, the member shall be required to take such corrective measures as necessary, including the installations of active or passive filtering, to guarantee a TDD or individual harmonic order value of not greater than the above values at the point of common coupling.

## **PROCEDURE:**

### **A. Application of Rules:**

- a. **Applicable Standards** – in addressing harmonics problems, MYEC and the member shall implement to the extent reasonably practicable, and in conformance with prudent operation, the practices outlined in IEEE Standard 519-1992, or any successor IEEE standard, to the extent not inconsistent with law, including state and federal statutes, orders, regulations, and applicable municipal regulations.
- b. **Investigation and Corrective Action** – MYEC shall investigate and determine the cause of the excessive harmonics. If MYEC determines that the member has created excessive harmonics that cause or are reasonably likely to cause another member to receive unsafe, unreliable or inadequate electric service, MYEC shall provide written notice to the member creating the excessive harmonics. The notice shall state that MYEC has determined that the member has created an excessive harmonics condition and that MYEC has explained the source and consequences of the harmonic problem. In addition to the right to disconnect as set forth above, MYEC in its discretion may use the following options:
  1. The member may elect to cure the problem on its side of the meter, at its cost, but the remedy must be completed no less than six (6) calendar weeks after notice. If the member does not cure the problem within six (6) weeks after notice, MYEC may cure the problem on its distribution system and assess all charges, including overheads, to the member. For facilities installed by MYEC for purposes of correcting a member's harmonic distortion, that member shall be responsible for a monthly maintenance fee. If corrections are necessary on the MYEC side of the meter; the monthly maintenance fee is 15% of the capitalized cost of the installed equipment that is needed because of the corrective actions undertaken by MYEC. The monthly minimum charge will not be less than \$25.
  2. If a dispute arises as to the determination of a member creating excessive harmonics the member and MYEC first will attempt to mediate the dispute with a mutually acceptable third party. Mediation shall take place within 90 days of the dispute. If mediation is not successful, the member and MYEC shall have the right to seek any remedies provided by law.
- c. **Harmonics From More Than One Source** – If, in its investigation of a harmonics problem, MYEC determines that two (2) or more members harmonic loads are individually within IEEE 519-1992 limits, but the sum of the loads are in excess of the IEEE 519-1992 limits, MYEC may require each customer to reduce its harmonic levels beyond the limits specified in IEEE 519-1992. However, in no event will any member be required to go below 5% TDD.

- d. Harmonics On a Feeder – If, in its investigation of harmonics on a feeder, MYEC determines there are multiple sources contributing to the problem, MYEC may install primary voltage (12.47 or 24.9 kV) filters to bring the feeder TDD within specified values and assess all nonfiltered services, based on connected kVA capacity, a proportional share of the installation and maintenance costs as outlined in b2 above.
- e. MYEC may, at its sole discretion, elect not to connect a nonfiltered variable speed drive service.
- f. All variable speed/frequency drive's (VFD's) single phase and three phase must meet IEEE standards for harmonic limits.

## **RESPONSIBILITY**

The CEO and Operations Manager shall each have the responsibility for the administration of this policy.