AS per TNERC Tariff Order

6.1.1.2 Harmonics:

(a) As specified in the Supply Code, when the consumer fails to provide adequate harmonic filtering equipment to avoid dumping of harmonics into Licensee’s network beyond the permissible limits as specified by CEA regulations, the consumer is liable to pay compensation at 15% of the respective tariff. The measurement of harmonics shall be done by the Distribution Licensee using standard meters/equipment in the presence of consumers or their representatives. This compensation charges is applicable to all HT categories of consumers except HT tariff IV (Lift Irrigation).

(b) It shall not be applicable for all HT consumers connected at 11 kV and 22 kV until the CEA prescribes any standard of harmonics for 11 kV/22kV supply line consumers and makes them also obligatory for harmonic controls.
1. (1) These regulations may be called the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Amendment Regulations, 2019.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 (hereinafter referred to as the said Regulations), in regulation 1, in sub-regulation (1), for the words “Connectivity of the Distributed Generation Resources”, the words “Connectivity below 33 kilovolts” shall be substituted.
2. Definitions -  (1) In these regulations -

(a) “Act” means the Electricity Act, 2003 (No. 36 of 2003);
(b) "applicant" means a generating company or a person seeking connectivity to the electricity system at voltage level below 33 kV for its distributed generation resource;

In regulation 2 of the said regulations, in sub-regulation (1),

(i) for clause (b), the following clause shall be substituted, namely:-

‘(b) “applicant” means a generating company, charging station, prosumer or a person seeking connectivity to the electricity system at voltage level below 33 kV;’;

Harmonic Limits

11. Standards for distributed generation resources. - Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519.

(2) The limits of injection of current harmonics at the point of common coupling by the user, method of harmonic measurement and other such matters, shall be in accordance with the IEEE 519-2014 standards, as amended, from time to time.

(3) The measuring and metering of harmonics shall be a continuous process with power quality meters complying with the provisions of IEC 61000-4-30 Class A.

(6) The data measured and metered as mentioned in sub-regulation (5), shall be available with the distribution licensee and be shared with the consumer periodically.

Provided that the user connected at 11 kV and above shall comply with the provision of this sub-regulation within twelve months from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Amendment Regulations, 2018. 6th February, 2020
Other PQ Issues

(8) In addition to harmonics, periodic measurement of other power quality parameters such as voltage sag, swell, flicker, disruptions shall be done by the distribution licensee as per relevant IEC standard and the reports thereof shall be shared with the consumer.

Applicability above 33 kv

1. (1) These regulations may be called the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019.

   (2) These regulations shall come into force on the date of their publication in the Official Gazette.

   ‘(25) “requester” includes a generating company, captive generating plant, energy storage system, transmission licensee (other than Central Transmission Utility and State Transmission Utility), distribution licensee, solar park developer, wind park developer, wind-solar photo voltaic hybrid system, or bulk consumer seeking connection for its new or expanded electrical plant to the Grid at voltage level 33 kV and above;’;

   (v) In addition to harmonics, periodic measurement of other power quality parameters such as voltage sag, swell, flicker, disruptions shall be done as per relevant International Electrotechnical Commission Standards by the distribution licensee and the reports thereof shall be shared with the consumer.

   (vi) The distribution licensee shall install power quality meters in a phased manner within three years from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2018 covering at least 33% of the 33 kV substations each year.”
Harmonic Limits

(3) Voltage and Current Harmonics. - (i) The limits of voltage harmonics by the distribution licensee in its electricity system, the limits of injection of current harmonics by bulk consumers, point of harmonic measurement, i.e., point of common coupling, method of harmonic measurement and other related matters, shall be in accordance with the IEEE 519-2014 standards, as amended from time to time;

(ii) Measuring and metering of harmonics shall be a continuous process with meters complying with provisions of IEC 61000-4-30 Class A.

(v) In addition to harmonics, periodic measurement of other power quality parameters such as voltage sag, swell, flicker, disruptions shall be done as per relevant International Electrotechnical Commission Standards by the distribution licensee and the reports thereof shall be shared with the consumer.

Measurement of Harmonics as per IEEE 519

5.2 Recommended current distortion limits for systems nominally rated 120 V through 69 kV

The limits in this subclause apply to users connected to systems where the rated voltage at the PCC is 120 V to 69 kV. At the PCC, users should limit their harmonic currents as follows:

— Daily 99th percentile very short time (3 s) harmonic currents should be less than 2.0 times the values given in Table 2.

— Weekly 99th percentile short time (10 min) harmonic currents should be less than 1.5 times the values given in Table 2.

— Weekly 95th percentile short time (10 min) harmonic currents should be less than the values given in Table 2.
Table 2—Current distortion limits for systems rated 120 V through 69 kV

<table>
<thead>
<tr>
<th>$I_{sc}/I_{L}$</th>
<th>$3 \leq h &lt; 11$</th>
<th>$11 \leq h &lt; 17$</th>
<th>$17 \leq h &lt; 23$</th>
<th>$23 \leq h &lt; 35$</th>
<th>$35 \leq h \leq 50$</th>
<th>TDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&lt; 20 \text{c}$</td>
<td>4.0</td>
<td>2.0</td>
<td>1.5</td>
<td>0.6</td>
<td>0.3</td>
<td>5.0</td>
</tr>
<tr>
<td>20 $&lt; 50$</td>
<td>7.0</td>
<td>3.5</td>
<td>2.5</td>
<td>1.0</td>
<td>0.5</td>
<td>8.0</td>
</tr>
<tr>
<td>50 $&lt; 100$</td>
<td>10.0</td>
<td>4.5</td>
<td>4.0</td>
<td>1.5</td>
<td>0.7</td>
<td>12.0</td>
</tr>
<tr>
<td>100 $&lt; 1000$</td>
<td>12.0</td>
<td>5.5</td>
<td>5.0</td>
<td>2.0</td>
<td>1.0</td>
<td>15.0</td>
</tr>
<tr>
<td>$&gt; 1000$</td>
<td>15.0</td>
<td>7.0</td>
<td>6.0</td>
<td>2.5</td>
<td>1.4</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Maximum harmonic current distortion in percent of $I_{L}$

Individual harmonic order (odd harmonics)$^{a,b}$