by electromagnetic induction from 1
coll to another to change the original
voltage or current value.

Transformer with tap range of 20 per-
cent or more means a transformer with
multiple voltage taps, the highest of
which equals at least 20 percent more
than the lowest, computed based on the
sum of the deviations of the voltages of
these taps from the transformer’s
nominal voltage.

Underground mining distribution trans-
former means a medium-voltage dry-
type distribution transformer that is
built only for installation in an under-
ground mine or inside equipment for
use in an underground mine, and that
has a nameplate which identifies the
transformer as being for this use only.

Uninterruptible power supply trans-
former means a transformer that is
used within an uninterruptible power
system, which in turn supplies power
to loads that are sensitive to power
failure, power sags, over voltage,
switching transients, line noise, and
other power quality factors.

Waveform correction means the adjust-
ment(s) (mathematical correction(s))
of measurement data obtained with a
test voltage that is non-sinusoidal, to a
value(s) that would have been obtained
with a sinusoidal voltage.

Welding transformer means a trans-
former designed for use in arc welding
equipment or resistance welding equip-
ment.

[70 FR 60416, Oct. 18, 2005, as amended at 71
FR 24995, Apr. 27, 2006; 71 FR 60662, Oct. 16,
2006; 72 FR 58239, Oct. 12, 2007]

TEST PROCEDURES

§ 431.193 Test procedures for meas-
uring energy consumption of dis-
tribution transformers.

The test procedures for measuring
the energy efficiency of distribution
transformers for purposes of EPCA are
specified in appendix A to this subpart.

[71 FR 24997, Apr. 27, 2006]
(c) Medium-Voltage Dry-Type Distribution Transformers. The efficiency of a medium-voltage dry-type distribution transformer manufactured on or after January 1, 2010, shall be no less than that required for their kVA and BIL rating in the table below. Medium-voltage dry-type distribution transformers with kVA ratings not appearing in the table shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

**TABLE I.2—STANDARD LEVELS FOR MEDIUM-VOLTAGE, DRY-TYPE DISTRIBUTION TRANSFORMERS, TABULAR FORM**

<table>
<thead>
<tr>
<th>BIL kVA</th>
<th>20–45 kV efficiency (%)</th>
<th>46–95 kV efficiency (%)</th>
<th>≥96 kV efficiency (%)</th>
<th>BIL kVA</th>
<th>20–45 kV efficiency (%)</th>
<th>46–95 kV efficiency (%)</th>
<th>≥96 kV efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>98.10</td>
<td>97.86</td>
<td>97.50</td>
<td>15</td>
<td>97.50</td>
<td>97.18</td>
<td>97.00</td>
</tr>
<tr>
<td>25</td>
<td>98.33</td>
<td>98.12</td>
<td>97.90</td>
<td>30</td>
<td>98.12</td>
<td>97.86</td>
<td>97.63</td>
</tr>
<tr>
<td>37.5</td>
<td>98.49</td>
<td>98.30</td>
<td>98.00</td>
<td>45</td>
<td>98.30</td>
<td>97.90</td>
<td>97.63</td>
</tr>
<tr>
<td>50</td>
<td>98.60</td>
<td>98.42</td>
<td>98.20</td>
<td>75</td>
<td>98.20</td>
<td>97.80</td>
<td>97.57</td>
</tr>
<tr>
<td>75</td>
<td>98.73</td>
<td>98.57</td>
<td>98.49</td>
<td>112.5</td>
<td>98.49</td>
<td>98.30</td>
<td>98.12</td>
</tr>
<tr>
<td>100</td>
<td>98.82</td>
<td>98.67</td>
<td>98.60</td>
<td>150</td>
<td>98.60</td>
<td>98.42</td>
<td>98.20</td>
</tr>
<tr>
<td>167</td>
<td>98.96</td>
<td>98.83</td>
<td>98.73</td>
<td>225</td>
<td>98.73</td>
<td>98.57</td>
<td>98.42</td>
</tr>
<tr>
<td>250</td>
<td>99.07</td>
<td>98.95</td>
<td>98.82</td>
<td>300</td>
<td>98.82</td>
<td>98.67</td>
<td>98.53</td>
</tr>
<tr>
<td>333</td>
<td>99.14</td>
<td>99.03</td>
<td>98.90</td>
<td>500</td>
<td>98.90</td>
<td>98.83</td>
<td>98.63</td>
</tr>
<tr>
<td>500</td>
<td>99.22</td>
<td>99.12</td>
<td>99.00</td>
<td>750</td>
<td>99.07</td>
<td>98.95</td>
<td>98.80</td>
</tr>
<tr>
<td>667</td>
<td>99.27</td>
<td>99.18</td>
<td>99.15</td>
<td>1000</td>
<td>99.14</td>
<td>99.03</td>
<td>98.90</td>
</tr>
<tr>
<td>833</td>
<td>99.31</td>
<td>99.23</td>
<td>99.20</td>
<td>1500</td>
<td>99.22</td>
<td>99.12</td>
<td>99.00</td>
</tr>
<tr>
<td>2500</td>
<td>99.31</td>
<td>99.23</td>
<td>99.20</td>
<td>2500</td>
<td>99.31</td>
<td>99.23</td>
<td>99.20</td>
</tr>
</tbody>
</table>

Note: All efficiency values are at 50 percent of nameplate rated load, determined according to the DOE Test-Procedure. 10 CFR Part 431, Subpart K, Appendix A.

(d) Underground Mining Distribution Transformers. [Reserved]

APPENDIX A TO SUBPART K OF PART 431—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF DISTRIBUTION TRANSFORMERS

1.0 Definitions.

The definitions contained in §§431.2 and 431.192 are applicable to this appendix A.

2.0 Accuracy Requirements.

(a) Equipment and methods for loss measurement shall be sufficiently accurate that measurement error will be limited to the values shown in Table 2.1.