

Department of Energy (DOE) 2010 Ruling

This Frequently Asked Questions List (FAQ) was developed to provide a resource for Cooper Power Systems (CPS) sales engineers representatives and customers to answer questions and advance discussions of the DOE 2010 ruling.

1. What is the Department of Energy (DOE) 2010 ruling?

On October 12, 2007 the Department of Energy (DOE) established standard versus minimum efficiency values for all Distribution transformers rated through 2500 kVA. This includes Single Phase, Three Phase, and Substation type, Liquid-filled and Dry-type transformers. The ruling takes effect for all transformers manufactured after January 1, 2010.

2. Are all transformers (less than or equal to 2500 KVA) subject to this ruling, regardless if they manufactured outside the US?

With the exception of mining, all 3-phase step-down transformers 2500 kVA or smaller and installed in the US or US territories, must be DOE compliant.

3. How will the size of DOE compliant transformers compare to existing designs that are not DOE compliant?

The overall transformer footprint for a liquid-filled transformer will be similar in size to existing designs. A larger tank may be required due to the increased core and coil size, but less external cooling is required due to lower losses. The final result is a similar total footprint size, however weight may increase due to design considerations.

4. Why did the DOE mandate the new efficiency requirements?

The mandate was intended to reduce the need for additional energy production and associated green house gases.

5. Where are the efficiency requirements available to review?

The DOE efficiency standards can be viewed at the Federal Register web site:
<http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi> under the category "fr12oc07R Energy Conservation Program for Commercial Equipment."

6. When does the DOE ruling go into effect?

It goes into effect on January, 1 2010.

7. Will making DOE compliant transformers require the use of "higher" grades of steel?

Yes, it will always require at least one grade higher core steel than a present less efficient design, and it will often use more pounds of core steel.

8. Should customers consider buying DOE compliant transformers to replace transformers that were installed prior to the January 2010?

A customer's energy consumption can be decreased by purchasing a more efficient transformer. A simple payback calculation can be completed when comparing the transformer losses and multiplying the difference times the cost of energy.

9. Are "remanufactured" transformers subject to the same efficiency requirements as new transformers?

Remanufactured transformers are not currently subject to the DOE mandate.

10. Are dry-type transformers subject to the same ruling and efficiency requirements as liquid-filled transformers?

Medium voltage dry-type transformers are subject to the same DOE ruling but have a less stringent set of requirements.

11. Are transformers sold into the wind market subject to the same requirements?

The DOE standard only applies to distribution step-down transformers.

12. Are voltage regulators subject to the same efficiency requirements?

Voltage regulators are not subject to the DOE ruling.

13. What is CPS doing to alert customer's of this change to DOE compliance?

CPS is providing a DOE awareness kit to its sales force including materials to educate end users and customers. DOE compliant designs will be noted as such in quotations.

14. What are the added benefits of a DOE compliant FR3 fluid-filled transformer?

CPS is taking the opportunity to promote FR3 fluid with the DOE ruling as part of its' "Green Initiative". FR3 fluid is a perfect product to support the DOE ruling by promoting the use of a renewable resource that further reduces greenhouse gases.

15. Can FR3 fluid make an existing non-DOE-compliant transformer DOE compliant?

No, FR3 fluid alone can not change an existing transformer efficiency. For new designs, the use of FR3 fluid increases the transformers life expectancy, improves it's thermal life, improves the fire safety, and is a carbon negating product solution.

16. Amorphous core transformers were once heralded as the 'best choice' for energy efficiency. Is this true?

Amorphous core transformers may be an option offered by some manufacturers in meeting the DOE efficiencies. CPS has determined the efficiency values can easily be met with existing silicon steel technology. Amorphous will continue to carry a higher cost to supply.

17. Will amorphous core transformers be required to meet DOE efficiency standards?

Yes. Amorphous transformers are also subject to the DOE ruling.

18. Will CPS build amorphous core transformers if a customer insists on including in their specifications?

CPS is currently evaluating the technology.

19. If an existing customers' transformer needs to be re-designed to meet DOE compliance, what needs to be re-designed?

If a re-design is required, optimizing the core/coil assembly is likely. The fluid volume and external cooling might also decrease.

20. Will making DOE compliant product require new factory manufacturing processes?

No, new processes are not required for any CPS product-lines.

NOTE: Dry-type transformer manufacturers may have to invest in some new equipment.

21. How will CPS certify our units are DOE compliant?

The DOE allows manufacturers to choose between two methods of compliance. The method that CPS will be using verifies the accuracy of our engineering and manufacturing systems, not individual units as allowed by the DOE ruling.

22. What is the typical lead-time impact of a DOE compliant transformer?

The requirement of a DOE compliant transformer by itself does not translate into a difference in lead time.

What is the typical price impact of a DOE compliant transformer?

Use of more efficient materials to meet DOE efficiency levels will increase the cost of transformers compared to the cost of less efficient transformers. The extent of the increase will be determined by the cost of raw materials at the time of order.

23. Is there a benefit to converting to a DOE compliant design before the ruling goes into effect?

As energy rates continue to increase, so does the value of a kilowatt. The earlier customers adopt to the increased efficiency, the earlier they can realize the benefits of reduced operating costs.

Ex. 1500kVA
Loss reduction (50% loading): 2200W
Savings per year (9c/kWhr): \$1,730
Savings over life of transformer (30 yrs): \$52,000

24. Will every unit shipped meet or exceed the standard efficiency levels listed in the DOE ruling?

The DOE ruling acknowledges variation in the design and manufacturing processes, so units may be above, below, or right on the value listed in the ruling. If a customer requires DOE standard efficiency on a guaranteed minimum basis, CPS can comply. However, there may be a cost associated with insuring that every unit tests above the published efficiency level.

25. Are other manufacturers promoting the use of DOE compliant transformers now?

Yes, some manufacturers are taking the initiative to make customers aware of the DOE ruling and advise them of their capabilities. Other have remained silent. CPS encourages early adoption of FR3 fluid-filled DOE compliant designs to realize the efficiency savings and environmentally responsible benefits it provides.

26. Will transformer impedance drop with higher efficiencies?"

Transformer impedance required by ANSI C57.12.00 will be maintained with the new DOE regulations.

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